

# Species Action Plan for Sussex

## glow- worm

*Lampyris  
noctiluca*



*Lampyris noctiluca* © Sussex Wildlife

### 1. Introduction / Current Status

In spite of its name, the glow-worm is actually a beetle. The glowing light seen at night is produced by the adult female, attempting to attract a mate. In fact all stages of the life cycle, including the egg, exhibit some degree of bioluminescence at certain times (Chinery, 1976 p310). However, the glow produced by the adult female from the last three segments of her abdomen when attracting a mate is far brighter than the glow produced at other times and it is this that gives the glow-worm its familiar name.

The common glow-worm, *Lampyris noctiluca* is a member of the Order Coleoptera, Superfamily Cantharoidea, Family Lampyridae (Chinery, 1976). There are actually two species of glow-worm in Britain; the other is the Lesser Glow-worm, *Phosphaenus hemipterus* also a member of the Lampyridae. Records of this are very few, but include at least two from Sussex and it is a Red Data Book species (Shirt, 1987). This Species Action Plan, however, refers exclusively to *L. noctiluca*. The glow-worm is not protected under the Wildlife and Countryside Act 1981, nor is it a UKBAP species.

#### 1.1 Life History

Tyler (2002, p9ff) gives a detailed description of the life history of *Lampyris noctiluca* based on his own work and that of the German researcher Hans Schwalb. Adults emerge in June or July and immediately commence the search for a mate. The wingless adult female does not feed and generally survives only a few weeks. She ascends to a vantage point and starts to glow shortly after emerging from the pupa. Glowing ceases after successful mating, then the female lays up to 150 eggs and dies. The larvae hatch from the eggs after about three weeks, feed actively during the summer and then hibernate over winter. In the spring they continue feeding and then hibernate for a second winter. In captivity the larvae pupate in the spring following the second winter, but in the wild they may go a third year before doing so.

The larvae feed on slugs and snails. Tyler (2002, p14) lists 37 species of slugs and snails that may be taken by glow-worm larvae. The larvae hunt the snails, often travelling quite long distances and kill them by injecting a mixture of paralysing and digestive juices.

## 1.2 Habitat

Tyler (2002, p54) lists *L. noctiluca*'s habitats as "downland, pastures, meadows, roadside verges, hedgerows, railway embankments, churchyards, golf courses, gardens, moorland, heathland, quarries, canal towpaths, and waste ground". He considers that the structure of vegetation, in other words its height, density, shade and shelter, may be more important than its composition. Also, a mixture of open grass and some form of cover such as scrub, brambles or woodland edge is preferred to pure woodland or pure grassland. As glow-worm females and the larvae are flightless, past accessibility is also a significant factor. Suitability as habitat for snails must also be important.

The best form of grass cutting management may be:

- No grass cutting at all during the glowing season (from the beginning of June until the middle or end of August).
- If cuts are vital, they should be kept high in order that the insects are not harmed.
- Cut material should be left lying rather than collected
- Cutting in wet weather should be avoided to prevent a thick mat of cut material being produced, which would be difficult for a glow-worm to navigate (Scagell 2003)

On pastureland, grazing systems should preferably be extensive and organic. The use of fertilisers and herbicides will degrade the habitat for molluscs and so deprive glow-worms of their food.

Scrub management is also an issue as scrub development reduces glow-worm habitat. Scrub clearance will be necessary on unmanaged sites such as disused railway lines

## 1.3 Distribution

*L. noctiluca* occurs throughout Britain. It occurs throughout Europe up to the Arctic Circle and across Asia to China (Tyler, 2002, p 53). Distribution in mainland Britain shows a distinct gradient from southeast to northwest, with decreasing frequency in Scotland.

Appendix 1 is a map showing the distribution of *L. noctiluca* records in Sussex in relation to Natural Areas. The Sussex Biodiversity Record Centre holds details of records for *L. noctiluca* in Sussex. It is very unlikely that all glow-worm populations in the county have been identified and recorded. It is not possible to estimate how many unrecorded populations there may be.

Some caution is needed when basing estimates of distribution and population size on the presence or apparent absence of glowing females. Females glow for a maximum of about three weeks and much less if they find a mate promptly. Thus populations may be overlooked and single counts of the number of glowing females present is not a reliable indication of population size.

## 2. Current Factors causing loss or decline

Wotton (1971 and 1974), Tyler (2002) and Scagell (2003) all refer to an apparent decline in the population of glow-worms. They do not provide any firm evidence for this, and Tyler is careful to point out that this is based on anecdote. They are now apparently absent from sites where they were once plentiful. Clearly there are threats to glow-worm populations and Tyler

(2002, p58ff) lists six of them: habitat destruction, habitat change, habitat fragmentation, pollution, artificial light and climate change.

Habitat destruction is likely to have had a significant effect. Urbanisation and industrialisation will have resulted in sites being permanently lost. Agricultural change is also likely to have had an effect. The ploughing of downland, the cessation of grazing and the encroachment of scrub are examples given by Tyler (2002) and of which there are many throughout Sussex. He also surmises that habitat fragmentation, resulting from agricultural and industrial development, is likely to have had an effect, particularly as the female and larval glow-worm is wingless. This is likely to have an effect on their ability to recolonise a site.

Insecticide use may affect glow-worm populations especially drift on to hedgerows and field margins. Molluscicides may affect the prey populations.

The effect of artificial light is difficult to determine. Apparently the female will glow in its presence, but it may be that the males are confused by it. Tyler (2002) reports instances of males being attracted by artificial light and of an LED female glow-worm simulator attracting fewer males in the vicinity of street lights. It is not known if any populations in Sussex are affected by street lighting. Tyler (2002) provides some suggestions on mitigating the effects, which might be considered if populations are affected.

It is not possible to predict the effect of climate change on the distribution of *L. noctiluca*.

### **3. National Species Action Plan**

There is no National Species Action Plan.

### **4. Current Action**

#### **National**

The UK glow-worm survey has shown that there are hundreds of sites throughout Britain, where glow-worms can be seen and more sites are reported every year.

The UK glow-worm survey website holds general glow-worm information, images, records from around Britain and details of the survey: <http://website.lineone.net/~galaxypix/>

Glow-worm work in progress in some other counties is detailed on the following websites:

Essex glow-worm survey: <http://website.lineone.net/~galaxypix/instructions.htm>

Dorset (glow-worm hunt): [www.imagesofdorset.org.uk/Dorset/079/intro.htm](http://www.imagesofdorset.org.uk/Dorset/079/intro.htm)

#### **Sussex**

A number of sites, where glow-worms exist, are managed in such a way that the habitat requirements for the insect are maintained. For example, the Sussex Wildlife Trust chalk grassland reserves of Malling Down and Ditchling Beacon as well as the Lewes Railway Land Local Nature Reserve.

There is a Sussex glow-worm recording scheme. Records can be sent to the Sussex Biodiversity Record Centre (SxBRC), Woods Mill, Henfield, West Sussex, BN5 9SD; [sxbrc@sussexwt.org.uk](mailto:sxbrc@sussexwt.org.uk).

## 5. Objectives

1. To protect existing populations
2. To increase public awareness of glow-worms, their habitats, the threats they face and the need to protect them.
3. To increase the number of glow-worms in Sussex

## 6. Targets and Costs

**This Species Action Plan has now been archived**

## 7. Potential

It should be possible to identify more populations and to place a significant number of them under some degree of protection to ensure the continuing survival of the species in Sussex. The 2001 Essex glow-worm survey will be used as a model for a Sussex survey, commencing in 2004.

Female glow-worms and the larvae are flightless and consequently colonisation of new sites is unlikely. This increases the importance of ensuring the protection of existing sites. It may be possible to encourage the recolonisation of sites known to have supported glow-worm populations in the past where these still link to habitat with surviving colonies. These sites may have lost populations because of alterations in habitat. Tree and scrub clearance, or the introduction of artificial lighting, leads to an increase in light intensity. If the site becomes overgrown with large vegetation, too much shading may result. Where semi-natural grassland vegetation redevelops or artificial lighting is removed, the habitat could become suitable for glow-worms once more.

Relocation or captive breeding and reintroduction of glow-worms has been carried out with varying degrees of success and are best avoided. There can be high mortality rates. (Scagell 2003)

### 7.1 Potential for public involvement - the Sussex glow-worm survey

Glow-worms are a unique subject, with potential for an investigation and conservation programme involving participation by members of the public. The threats to *L. noctiluca* are similar to those faced by many other species of insects and indeed other invertebrates generally. However, they are one of the few invertebrates, other than butterflies and dragonflies, and one of possibly only three beetles (the others being the Stag beetle and the ladybird) that arouse public interest and curiosity. They have figured in poetry and children's stories and have a unique place in the public consciousness. Glowing females can be sought on warm summer evenings in the hours before midnight. They occupy a range of easily

accessible habitats. They are unmistakable, so there are no problems of correct identification, no need for special equipment and training requirements are minimal. It should be noted that certain British centipedes can emit a similar glow and records should always be confirmed by inspecting the insect and checking it only has three pairs of legs.

As part of the Sussex Glow-worm Survey, naturalists active in nature conservation and members of the public will be encouraged to submit glow-worm records to SxBRC, in order to improve knowledge of the distribution of the species across the county. Volunteers will also be encouraged to visit sites where glow-worms have been recorded in the past or where suitable glow-worm habitat is thought to exist and report the presence or absence of glowing females. Primary targets will be nature reserves and other sites that have potential for protection. Volunteers will be provided with information on glow-worms as well as recording forms and asked to visit sites during the months of June and July when the females glow.

Owners and managers of land will be notified of the presence and location of populations and requested to avoid actions that might be harmful. Information will be provided for them on glow-worm natural history and how to avoid harming them or their habitat. Local Authorities will be informed about the presence of any populations on roadside verges and public land that is their responsibility. Consideration will be given to the possible effects of street lighting and appropriate recommendations made. In suitable circumstances proposals will be made to manage sites in order to increase the size of populations and to extend and link sites.

Existing glow-worm sites will be investigated in order to identify habitat requirements, to aid in the formation of management plans and the identification of suitable potential glow-worm sites.

The Sussex Glow-worm Survey will be co-ordinated by a student volunteer in conjunction with the Sussex Biodiversity Record Centre. Details of the survey as well as guidance notes and recording forms for volunteer surveyors are available from the Sussex Biodiversity Record Centre, Woods Mill, Henfield, West Sussex, BN5 9SD, [sxbrc@sussexwt.org.uk](mailto:sxbrc@sussexwt.org.uk) 01273 497521 and on the website: [www.sxbrc.org.uk](http://www.sxbrc.org.uk)

## **8. Action Plan**

**This Species Action Plan has now been archived**

## **9. Monitoring & Review**

This action plan will be monitored and reviewed on a five-yearly basis.

## **10. References**

Chinnery M (1976). A Field Guide to the Insects of Britain and Northern Europe. Second Edition. Glasgow: Collins

Scagell R (2003). UK Glow-worm survey website:  
<http://website.lineone.net/~galaxypix> (Accessed 3 March 2003).

Shirt D B (ed.) (1987) British Red Data Books: 2. Insects. Nature Conservancy Council.

Tyler J (2002). The Glow-worm. Sevenoaks: Tyler.

Wotton J (1971). The British Naturalists Association glow-worm survey. Country-side XXI (10): Summer 1971: 457-463

Wotton (1974). The British Naturalists Association glow-worm survey. Country-side Vol. XXII, (6) Spring 1974: 266-271.

## **11. Consultation**

Robert & Julie Howard (recorders/authors)

Bob Platt (author/SWT)

Benfield Wildlife Group.

Brighton and Hove City Council: [www.brighton-hove.gov.uk](http://www.brighton-hove.gov.uk)

Brighton Urban Wildlife Group

Country Land and Business Association: [www.cla.org.uk](http://www.cla.org.uk)

Department for Environment Food and Rural Affairs: [www.defra.gov.uk](http://www.defra.gov.uk)

East Sussex County Council: [www.eastsussexcc.gov.uk](http://www.eastsussexcc.gov.uk)

English Nature: [www.english-nature.org.uk](http://www.english-nature.org.uk)

Environment Agency: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) (lead)

Farming and Wildlife Advisory Group: [www.fwag.org.uk](http://www.fwag.org.uk)

Forestry Commission: <http://www.forestry.gov.uk>

High Weald AONB Unit - Weald Heathland & Meadows Initiatives: [www.highweald.org](http://www.highweald.org)

National Farmers Union: [www.nfu.org.uk](http://www.nfu.org.uk)

National Trust: [www.nationaltrust.org.uk](http://www.nationaltrust.org.uk)

Royal Society for the Protection of Birds: [www.rspb.org.uk](http://www.rspb.org.uk)

Sussex Biodiversity Partnership: [www.biodiversitysussex.org](http://www.biodiversitysussex.org)

Sussex Biodiversity Record Centre: [www.sxbrc.org.uk](http://www.sxbrc.org.uk)

Sussex Downs Conservation Board: [www.vic.org.uk](http://www.vic.org.uk)

Sussex University: [susx.ac.uk](http://susx.ac.uk)

Sussex Wealden Greensand Heath Project: <http://www.vic.org.uk>

Sussex Wildlife Trust: [www.sussexwt.org.uk](http://www.sussexwt.org.uk)

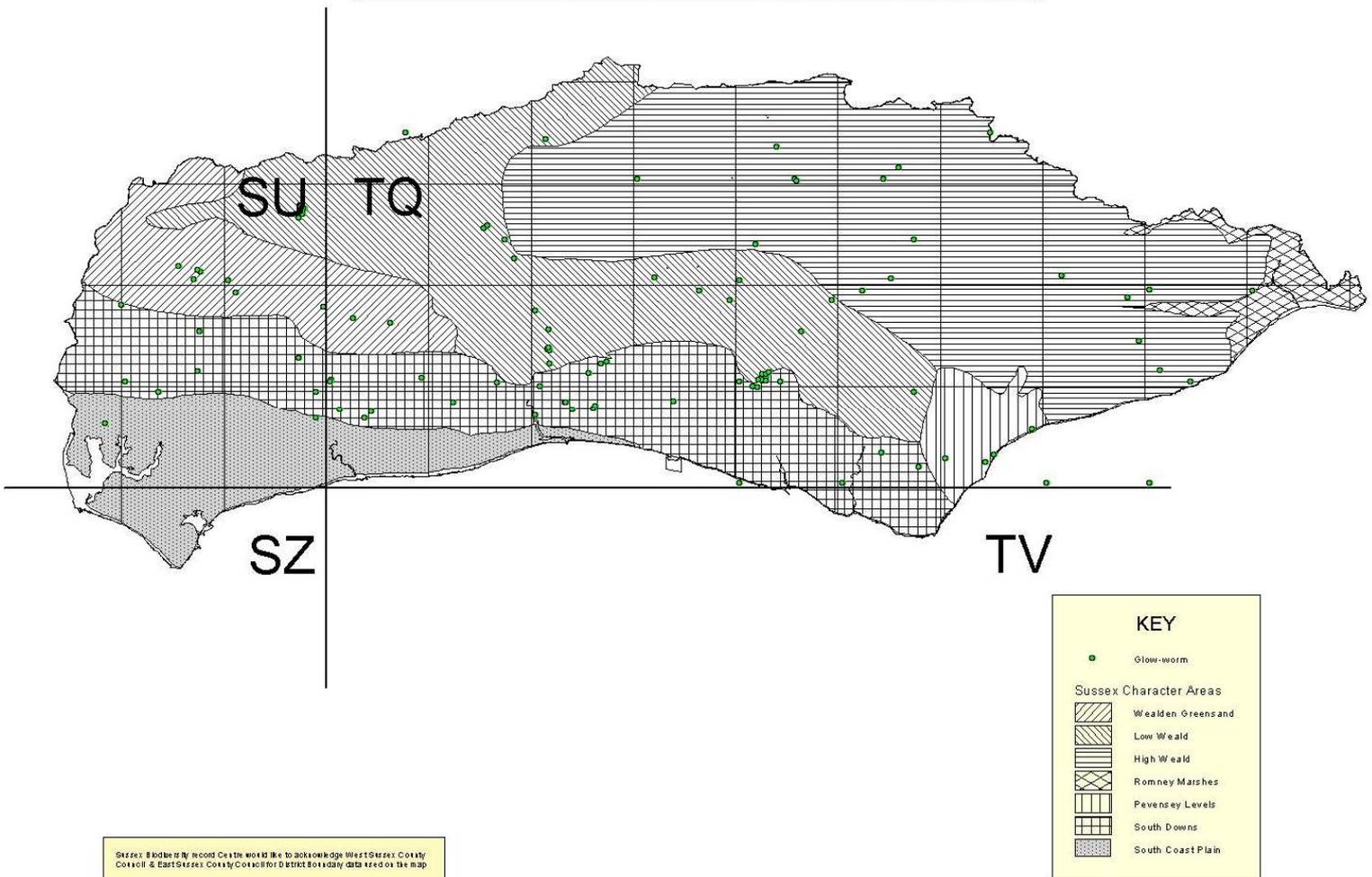
West Sussex County Council: [www.westsussex.gov.uk](http://www.westsussex.gov.uk)

Woodland Trust: [www.woodland-trust.org.uk](http://www.woodland-trust.org.uk)

# 12. Appendices

## Appendix 1:

Map showing glow-worm records in Sussex (1919 - 2002)  
Produced by the Sussex Biodiversity Record Centre 14/11/03



Sussex Biodiversity Record Centre would like to acknowledge West Sussex County Council & East Sussex County Council for District Boundary data used on the map