Science for Environment Policy
DG Environment News Alert Service
European Commission

26 July 2012

Street lighting affects insect biodiversity

Insect communities are permanently changed by the presence of street lighting, according to new research. The authors of the study found that predatory and scavenging insects such as ants and ground beetles were more common under streetlights at all times of day, suggesting that light pollution does not simply attract different types of animals at night.

Most of Europe is illuminated by artificial light. Satellite images show bright spots around urban centres such as London and Paris, but there are few areas that artificial light does not penetrate.[1] Street lighting reduces traffic accidents and helps prevent crime, but scaling down or turning off street lighting saves energy and reduces greenhouse gas emissions.[2] Globally, artificial lighting accounts for emissions equivalent to around 1900 Mt CO_2e (metric tonne carbon dioxide equivalent) each year. However, the impact of artificial light on wildlife is poorly understood.

Researchers in the UK trapped invertebrates – animals without a backbone, including spiders and insects – beneath and between streetlights spaced 35 metres apart in the town of Helston. They trapped a total of 1194 invertebrates, from 60 different taxa, over a period of three days and three nights. Overall, more were collected under the lights than between them and a breakdown of the different species present revealed that light levels changed composition species collected. For comparison, the types of plants present under the lights were similar to those between them.

The authors found higher numbers of harvestman, ants, ground beetles, woodlice and amphipods on the ground underneath street lamps. This represents an increase in the abundance of carnivorous invertebrates that are described as predators and scavengers. Because the researchers saw the same results at day and at night, they concluded that the invertebrate communities had been permanently changed by the light pollution. This research, funded by the European Research Council, is the first to show that street light affects ground-dwelling invertebrates and hints that light pollution may be having widespread effects on species composition within ecosystems.

A number of projects and campaigns, including Green Light (promoted by the EC)[3], focus on reducing the environmental impacts of artificial light in Europe. However, legislation varies between countries. Slovenia has the strictest light pollution legislation in the world – the 2007 Slovene Light Pollution Law allows no light at all above the horizon. In the UK, by comparison, there is no specific law dealing with light pollution, although some types of outdoor lights on buildings can be classified as a statutory nuisance.

1. Hanel, A. (2012). Initiative gegen Lichtverschmutzung. Dark Sky. See: http://www.lichtverschmutzung.de/seiten/karten_en.php
2. Holker, F. *et al*. (2010). The Dark Side of Light: A Transdisciplinary Research Agenda for Light Pollution Policy. *Ecology & Society*, 15(4), 13. See: http://www.ecologyandsociety.org/vol15/iss4/art13/
3. See: http://www.eu-greenlight.org/

Source: Davies, T. W., Bennie, J., & Gaston, K. J. (2012). Street lighting changes the composition of invertebrate communities. *Biology Letters*, (May). DOI:10.1098/rsbl.2012.0216
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Theme(s): Biodiversity, Urban environment