**Questionnaire - IWG EUROBATS Impacts of artificial light on bats**

Country: The Netherlands

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Note: We define artificial light as illumination of any kind of space by mean of artificial light source radiating to the environment, mostly during the night, but also during the day in bat roosts. Please underline **Yes/No** answers.

**Legislative part**

1. ***Existing legal requirements***

**1.1. Is there any national/regional legal framework (law, decree, etc.) concerning artificial light and wildlife (specifically bats) and its impact on the environment? If yes, please specify.**

Yes (general) Yes (also specifically on bats) No

**1.2.** **Is there are any specific legislation (law, decree, etc.) concerning artificial light in protected areas? If yes, please specify.**

Yes (general) Yes (also specifically on bats) No

There is no specific law or decree concerning artificial light, however there is a law on protected areas (Natuurbeschermingswet) that prohibits the use of artificial light when it may have negative impacts on protected areas. The same applies for species protected under the Flora and fauna act (Flora- en faunawet).

**1.3. Are impact assessments related to artificial light obligatory during strategic environmental impact assessment processes? If yes, please specify**

Yes (general) Yes (also specifically on bats) No

All bat species in the Netherlands are protected under the Flora and fauna act (Flora- en faunawet), which means that new developments may not have a negative impact on the conservation status of these species, unless there is an overriding public interest.

**1.4. Are impact assessments related to artificial light required in the specific plans or projects (e.g. in new development projects, spatial planning projects)? If yes, please specify.**

Yes (general) Yes (also specifically on bats) No

All bat species in the Netherlands are protected under the Flora and fauna act (Flora- en faunawet), which means that new developments may not have a negative impact on the conservation status of these species, unless there is an overriding public interest.

**1.5. Are bats being mandatorily considered during the strategic or specific environmental impact assessments related to artificial light? If yes, please specify.**

Yes No

All bat species in the Netherlands are protected under the Flora and fauna act (Flora- en faunawet), which means that new developments may not have a negative impact on the conservation status of these species, unless there is an overriding public interest.

**1.6. Is there any potential conflict between different legislation concerning artificial light and wildlife and those related to, for example, safety (e.g. building security, road illumination) and presentation of cultural heritage, etc.? If yes, please specify.**

Yes No

Regarding road safety there is an article concerning artificial light in the Civil code (Burgerlijk wetboek). This article states that the owner of a property or structure is responsible in case of a dangerous situation, this includes lighting. There is a potential conflict between this law and the law on protected areas (Natuurbeschermingswet) or the law on protected species (Flora- en faunawet). Public safety is one of the reasons for which derogations from the Flora and fauna act have been granted. These derogations contain specific measurements to mitigate and compensate the expected impact.

**1.7. Are there any environmental lighting zones or codes being implemented in the landscape planning (e.g. via CIE [http://www.lrc.rpi.edu/programs/NLPIP/lightinganswers/lightpollution/environmentalZones.asp], UNESCO [http://www.iucn.org/about/work/programmes/gpap\_home/gpap\_quality/gpap\_pacategories/], NATURA 2000 area for EU Members, or national/regional protected areas)? If yes, please specify.**

Yes No

**1.8. Are any national/regional governmental or non-governmental bodies actively addressing the problem of artificial light pollution? If yes, please specify.**

Yes No

* Since 2000, the ‘Platform Lichthinder’ is the Dutch representative of the International Dark Sky Association (IDA), which is the American light pollution organisation.
* The independent Provincial Environment Federations (de natuur- en milieu federaties) and the independent enviromental organization Natuur & Milieu organise a yearly event called “Night of the Night” (Nacht van de Nacht) to draw attention to light pollution.
* In Drenthe a.o., a province of The Netherlands, the provincial authority has removed many street lights (around one thousand street lights). The goal was to save money and energy and to reduce light pollution. However, according to the Dutch Traffic Safety Association it would be irresponsible to remove any more street lights.
* Rijkswaterstaat, Consultancies Regelink Ecologie and Landschap and Jasja Dekker Dierecologie, together with the The Nederlandse Stichting Voor Verlichtingskunde (Organisation for lighting), Ecosucces, EcoLogic and the Dutch Mammal Society organised a symposium on lighting design and ecological impact assessment/mitigation in 2014. (http://www.lichtenecologie.nl/)

**Expert part**

1. ***Impact on bats***

**2.1. Is there any evidence that bat species are affected by artificial light in your country? If yes, please specify (you can refer also to source table at the end of questionnaire)**

Yes No

See table of sources on the impacts of artificial lights and bats.

**2.2. Are there any documented cases of colony declines or roost desertions following installation of artificial light? If yes, please specify (species, location, type of artificial light, reference to source in the table)**

Yes No

**2.3. Are there any documented cases of impacts on commuting routes and/or foraging areas for bats following installation of artificial light? If yes, please specify (species, location, type of artificial light, reference to source in the table).**

Yes No

See table of sources on the impacts of artificial lighting and bats reference 1 and 2

**2.4. Are there any ongoing or already completed studies on artificial light and bats? If yes, please specify.**

Yes No

* Two research institutes (WUR and NIOO) and the Dutch mammal society are involved in a large ongoing study on artificial light on flora and fauna, bats are one of the species groups that are being studied. Website: <http://www.lichtopnatuur.org/nl/>
* Two other completed studies are mentioned in the table of source on artificial lighting and bats.

***3. Mitigation or compensation measures***

**3.1. Have any reports or guidance documents related to artificial light been developed** **(and specifically bats)? If yes, please specify.**

Yes (general) Yes (also specifically on bats) No

* A general guideline for public lighting (Richtlijn voor Openbare Verlichting ROVL-2011) was developed by the Netherlands foundation for lighting (Nederlandse Stichting voor Verlichtingskunde). This guideline is meant for administrators/owners of public sites or roads to guide them when to use and when not to use lighting.
* Information and measures to prevent or to limit impacts of artificial light specifically for bats can be found on an internet site of the Dutch mammal society: <http://www.vleermuizenindestad.nl/verstoring-voorkomen-beperken>

**3.2. Have any measures been put in place to avoid and/or mitigate the impact of artificial light on bats? If yes, please specify case studies (reference to source in the table)?**

Yes No

Measures taken include shielding off the light with fences or shrubs, aiming light on roads only using adapted armatures, and using new spectra of light (in LEDs). In some cases specially adapted light plans were implemented.

* Special amber coloured lighting was placed at highway A74 near Venlo in 2011 to mitigate the impact of artificial light on bats. Source: <https://staticresources.rijkswaterstaat.nl/binaries/Vleermuisvriendelijke%20LED-verlichting%20A74_tcm174-322929_tcm21-26804.pdf>
* Measures were taken to mitigate the impact of 6 lighting poles at a football field in Wolfheze. The lighting would have impact on a commuting route of pipistrelle bats. Mitigation measures: Armatures were adapted, extra shrubs were placed, lighting is off during certain time periods. Source: Handboek licht/donker, beleid en uitvoeringsinstrumenten voor provincies. Interprovinciaal Overleg (IPO), Arnhem, 2010.
* Adapted light at the Natura 2000 site “Lilbosch & Mariahoop”, where light was adapted to safeguard a commuting route of Myotis emarginatus. The management plan for Natura 2000 explicitly mentions the need to keep roosts and foraging areas (stables) unlit, and mentions requirements to lighting of commuting routes.
* Several management plans for Natura 2000 areas explicitly mention the need to keep hibernacula and summer roosts in that area unlit

**3.3.** **Are you aware of any studies on effectiveness of the implemented mitigation and compensation measures? If yes, please specify case studies.**

Yes No

***4. Reports and publications***

You are kindly requested to transmit to the EUROBATS Secretariat any studies and/or publications that have been produced in your country that are relevant to the consideration of the impacts of artificial light on bats and describing measures to reduce negative impacts, including any case study examples of good practice. Please cite relevant studies in the following source table.

**Table of source on artificial lighting and bats**

Please mark (x) the relevance of the article/report/study for the specific subject as precisely as possible (two examples are given).

| Source [web link if possible] | Illuminated structures… | | | | | | | Effect on … | | | | | Type of publication: | | | | | Bat species concerned |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cultural monuments, historical buildings | Cave tourism | Festivals, laser displays, sport events | Road lighting | Cliffs, bridges | Protected areas | Other (please specify) | Colonies | Emergence | Commuting | Foraging | Other (please specify) | Field/laboratory experiment | Mitigation | Review | Legislation | Guidelines / Best practice |
| Kuijper, D.P.J., J. Schut, D. van Dullemen, H. Toorman, N. Goossens, J. Ouwehand & H.J.G.A. Limpens. 2008. Experimental evidence of light disturbance along the commuting routes of pond bats (*Myotis dasycneme*).-Lutra 2008 51 (1): 37-49 |  |  |  |  |  |  | Light levels were experimentally manipulated  by placing a strong lamp along existing  commuting routes of pond bats |  |  | x | x |  | x |  |  |  |  | *Myotis dasycneme* |
| Limpens, H.G.J.A., J.J.A. Dekker, E.A. Jansen, & H. Huitema. 2011. Lichtproef meervleermuizen  Kuindervaart- Vergelijking van de effecten van verschillende kleuren straatverlichting op de vliegroute van meervleermuizen op de Kuindervaart. Rapport 2011.18 Zoogdiervereniging, Nijmegen. 16 pp. |  |  |  | x |  |  |  |  |  | x |  |  | x |  |  |  |  | *Myotis dasycneme* |
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