



MONITORING LIGHT POLLUTION

SUMMARY

This guide provides guidelines to map and monitor light pollution and its environmental impact. It supports the planning and implementation of environmentally sound lighting infrastructure.

The monitoring framework focuses on two main areas:

measuring light pollution and assessing its impact on biodiversity.

ECOLOGICAL MONITORING

Monitoring:

- is conducted before and after lighting modifications (as well as at a reference site, if possible)
- assesses impacts on local and migratory species
- focuses on ecological connectivity and habitats that support biodiversity

Possible selection of species groups based on:

- ecological relevance
- monitoring feasibility
- known responses to artificial light at night



	HOW?	WHAT?	WHEN?
BATS	Acoustic monitoring with automated ultrasonic recording	• Acoustic activity and temporal distribution • identifying species (groups) and behaviour	Late spring to early autumn
BIRDS	• Automated acoustic recording • Point/transect counts • Camera traps	• Acoustic activity and temporal distribution • Species diversity and abundance • Phenology	• late winter to early summer • season-round monitoring
INSECTS	Capture-based sampling (e.g. sticky traps)	Abundance and diversity of ALAN sensitive insect species groups	Late spring to early autumn
BENTHIC FAUNA	• Plot-based sampling (e.g. quadrats)	Biomass, diversity and community composition	Spring and autumn

LIGHT MEASUREMENTS

Assessing light pollution involves measuring different parameters. These measurements are crucial for evaluating lighting conditions and the effectiveness of lighting modifications.

SUMMARY

ILLUMINANCE

The amount of light falling onto a surface, indicating how brightly an area, such as a street or square, is lit

Unit: lux (lx)

Method:

- Measured with a lux meter
- typically on a grid to determine mean values
- professional calibrated instruments are recommended for accurate and long-term monitoring

CORRELATED COLOUR TEMPERATURE (CCT)

- Indicates the colour appearance of a light source
- Lower colour temperatures produce warmer light with less blue content, while higher colour temperatures produce cooler white light with more blue content and potentially stronger ecological and health impacts.

Unit: Kelvin (K)

Method:

- spectrometer or a light meter equipped with a CCT function

LUMINANCE

The brightness of a surface emitted or reflected in a specific direction (as perceived by the human eye), evaluating glare, road lighting, building facades, and public displays

Unit: candela per square meter (cd/m^2)

Method:

- Luminance meters can be handheld devices for spot measurements or camera-based systems for mapping brightness over larger areas or longer times.
- with additional fixation equipment (e.g. a tripod)

ZENITH SKY BRIGHTNESS

- brightness of the night sky directly overhead, measures how bright or dark the night sky is
- is often used as a characteristic value for the overall light pollution at a given location

Unit: magnitudes per square arcsecond (mag/arcsec^2) or millicandela per square meter (mcd/m^2)

Method:

- Measured with handheld or stationary instruments like Sky Quality Meter (SQM)
- Long-term measurements are recommended to exclude variability (clouds, moon, etc.)

ALL-SKY BRIGHTNESS

distribution of brightness across the entire night sky, assessing how evenly or unevenly light pollution affects different parts of the sky

Units: mag/arcsec^2 , cd/m^2 or even mcd/m^2 (milli cd/m^2)

Method:

- Calibrated all-sky cameras for spatial and temporal analysis
- Capturing the entire sky in a single image

MORE DETAILED INFORMATION

This summary provides a broad overview of recommended monitoring methodology. For all details about monitoring as well as the planning of artificial light at night and sociological surveys, please refer to the complete **Light Pollution Monitoring Guide**.



DARKER SKY RESOURCES:

www.interregnorthsea.eu/darker-sky/library



Interreg
North Sea



Co-funded by
the European Union

DARKER SKY

© DARKER SKY 2026

DARKER SKY is carried out in the framework of the Interreg North Sea Programme and is funded by the European Regional Development Fund (ERDF) of the European Union.



Light Pollution Knowledge Hub



www.interregnorthsea.eu/darker-sky



linkedin.com/company/darkersky-ns