2025 Ecology Review: The Hidden Cost of Light Pollution on Wildlife

Bill McGeeney, *Light Pollution News*.

Hi all, many folks don't realize the true magnitude of the impact of artificial light at night. It's not that artificial light itself is inherently dangerous, nor is it true that we shouldn't have any artificial light. Rather, in our modern world, we lack any responsible behavior with our lighting, creating a hazardous nighttime environment that offers little protections in the way for mammals, insects, and even plants/trees. While you may have the ability to just 'close the curtain,' nature doesn't.

I put this teaser together regarding the most impactful ecology and environment related research and news articles during the 24 Light Pollution News podcast episodes from 2025. You can find the full details on the 49 research and news articles at the link below. Unlike persistent chemical contaminants, many of these ecological impacts can be quickly reversed once individuals, businesses, and municipalities commit to simply being responsible with their lighting.

For the complete review with links to all research articles, visit lightpollutionnews.com/research/2025-review-impact-of-artificial-light-at-night-on-environment

Underground Impacts

- A nine-year field study documented how blue-spectrum streetlights reduce earthworm populations and biomass while disrupting soil aggregation patterns.
- When researchers tested whether grass spiders prioritize prey or light when building webs, 79% of light-exposed spiders chose illuminated corners without prey over dark corners with abundant insects.
- UK weather radar tracking from 2014-2021 revealed consistent nocturnal insect declines, especially moths in northern regions, with both day and night species avoiding light-saturated areas.

Avian Disruption

- Atlantic puffin fledgling experiments in Newfoundland showed young birds chose every illuminated path regardless of bulb type, sodium vapor and all LED wavelengths attracted equally. Researchers concluded only eliminating coastal lighting during fledging prevents puffin strandings.
- Global studies document song birds extending daily activities unnaturally under nighttime brightness, with compromised immune function in lit environments. Species specific vulnerabilities require tailored conservation approaches.

Aquatic System Changes

- Coral reef experiments revealed 25 consecutive nights of illumination kept daytime-hunting fish active after dark, fundamentally altering predator-prey timing.
- Young salmon face heightened predation where lights reach waterways, while amphipods show sex-specific responses potentially skewing population ratios.
- Coastal lighting links to harmful algal blooms, with extended light exposure favoring toxic varieties.

Conservation Progress

- Hawaiian Electric lawsuits established enforceable deadlines for lighting modifications protecting seabirds.
- Houston and Philadelphia Lights Out campaigns measured real reductions in migration-period bird deaths.
- Motion-activated LED systems cut bat exposure while preserving safety.
- Spectral research confirms amber and red wavelengths harm insects less than blue-heavy white light.
- Lake Erie communities voluntarily darken streetlights during mayfly emergences, while Austin integrated window treatments with strategic lighting placement. Evidence shows mandatory regulations paired with architectural standards remain essential for wildlife protection at scale.