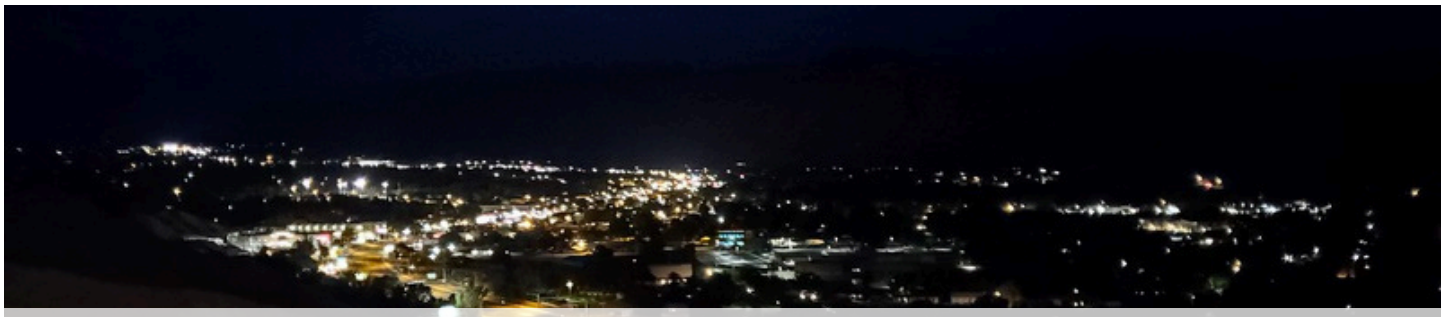


Impacts of Digital Billboards on Wildlife

SCENIC AMERICA

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Digital billboards are rapidly proliferating across America, introducing intense, continuous LED illumination that disrupts the natural rhythms of wildlife, ecosystems, and plants.

These high-brightness screens contribute significantly to light pollution or artificial light at night (ALAN). ALAN is an underrecognized environmental hazard that both impacts the visual environment and interferes with how animals move, forage, reproduce, and communicate.

How it Works

Animals have evolved over millions of years to use light as their primary environmental cue. ALAN interferes with this system in the following ways:

- **Circadian disruption:** Continuous illumination confuses internal biological clocks, shifting the timing of sleep, feeding, reproduction, and migration.
- **Disorientation:** Many species use natural light gradients to navigate. Bright artificial sources attract, repel, or misdirect animals.
- **Physiological changes:** Through chronic stress, ALAN can alter biological rhythms such as thermoregulation, locomotor activity, and reproduction through testosterone cycles.
- **Increased Predation:** More light means that prey are more visible to predators. For example, sky glow decreases moth diversity through increases in predation.



Image above: Sudden brightness disorients nocturnal senses, making navigation and safe flight more difficult for nocturnal aviators such as bats.

*Every day, **Scenic America** helps citizens, public officials, and neighborhood groups improve the character and aesthetics of their communities. We believe beauty is good for business and everyone deserves to live, work, and play in beautiful places.*

What the Research Shows

- Even illumination as faint as half a full moon is enough to drive conservation-sensitive shorebirds away from otherwise suitable habitat and disrupt fish spawning events along the California coast.
- Light pollution draws nocturnal migrants off course, increases collision risk with illuminated structures, degrades stopover habitat quality, and increases energy expenditure.
- Light pollution causes birds to wake up earlier, sleep less, and alter the onset and offset of daily singing, decreasing resting time, increasing physiological demand, and potentially reducing reproductive success.
- Light pollution, regardless of light color, had an almost immediate effect on composition of invertebrates.

Ecosystems and Plants

In addition to affecting individual animals, ALAN changes how species interact with one another and how ecosystems function:

- **Shifts in pollinator activity —** The presence of ALAN has shifted crepuscular species like bees to pollinate flowers later at night and/or earlier in the morning, negatively affecting plant reproduction. For example, in one study, nocturnal pollination visits to plants dropped 62% in artificially lit areas.
- **Abnormal inactivity in nocturnal species —** In light-polluted environments, nocturnal species such as bats or rodents display abnormal inactivity.
- **Disrupted Aggregation Patterns —** Increased aggregation around light sources at night, disrupting food webs, pollination, and seed dispersal.
- **Foraging extension of diurnal predators —** Earlier shifts in daytime predators' morning activity increase predation risk to prey species.
- **Biodiversity Loss —** ALAN may affect complex ecological interactions, ultimately leading to biodiversity loss.
- **Disruption of seasonal light cues —** May lead to foliage dropping in trees, lengthening of the growing season, decreasing plant diversity, or decreasing physical performance such as leaf area.

Taking Action

Extinguishing and dimming lights and banning new digital billboards is a first priority to reducing the ecological impact of ALAN. Lighting ordinances, nighttime dimming requirements, and requiring billboards to be turned off during late night hours are proven tools for reducing ALAN. Scenic America is available to provide technical assistance and model policy language.