Keep the Night On

Reducing Ecological Impacts of Artificial Lighting in the Coastal Environment

What is artificial lighting?

Artificial lighting refers to lights placed near the shoreline that alter where, when, how much, and what wavelengths of light are present. Commonly termed "light pollution," this excess light comes from a variety of sources, including streetlights in residential or commercial areas, advertising lighting, architectural lighting, and vehicle lighting. These different forms of lighting differ in their timing and intensity, creating a patchwork of excess light reaching coastal habitats. In highly urbanized areas such as Southern California, the combination of multiple artificial light sources over a broad area can create a diffuse "sky glow" in addition to more direct impacts.

Why it's a problem

Artificial light in marine and coastal areas can have a variety of negative impacts on habitats and species, including seabirds and migratory songbirds. For example, these birds can suffer from "light entrapment" and become unable to leave the illuminated area until they become exhausted or collide with a structure or window. Additionally, several species of small seabirds, including some threatened and endangered types of shearwaters and murrelets, have developed nocturnal feeding strategies in an attempt to avoid predation. Artificial lighting of the feeding areas for these species can negate this strategy and increase their risk of capture and injury.

While information is still sparse on the specific impacts of lighting for other California species, science suggests that artificial lighting can impact our local intertidal environments. Just like in the air, illuminating otherwise dark shorelines allows visually-oriented tidepool and marine predators to use more efficient daytime foraging techniques, increasing the susceptibility of prey species in these areas to predation as well. Artificial lighting also blurs the difference between day and night, disorienting organisms and causing novel overlaps between species that are generally active during different portions of the day.

However, the impacts of artificial light are more complex than new sources and increased intensity. Each type of artificial lighting has a unique spectral signature, emitting light at varying intensities over a distinctive range of wavelengths. These spectral compositions differ from those of natural direct or diffuse sunlight, twilight, and moonlight. In recent years, artificial lighting has shifted to lights which emit a broad spectrum of wavelengths ("white light"), increasing the potential for ecological impacts.

This informational handout was developed by the California Ocean Protection Council in collaboration with staff of the California Coastal Commission and Orange County Coastkeeper. To learn more about our work, please visit www.opc.ca.gov, www.coastal.ca.gov, and www.coastkeeper.org.

How you can help

Interested in being a good neighbor to the many species that call Southern California beaches and tidepools home? If you own or manage property near the coast, there are steps **you** can take to protect California's coastal environments from light pollution.

- Does your property have lighting that could impact marine life along the coast?
    - Remember that many animal species can see in light levels much lower than those in which our vision functions. Light that is barely perceptible to the human eye may still be sufficient to impact coastal species.
    - Even if your property isn't immediately adjacent to the shoreline, you may still be contributing to "sky glow" and adding to the aggregate light pollution in urban areas.
- If yes, is the lighting necessary for public safety?
    - **No?** Consider removing the lighting.
    - **Yes?** Investigate alternative options. Flexible response lighting systems that are triggered by movement are a great option. Also consider lights that emit a narrow band of wavelengths, rather than broad spectrum "white lights."

There is still much we don't know about how light affects ecosystems along the Southern California coastline, but a precautionary approach to lighting minimizes the potential impacts.

Protecting our MPAs

California's statewide network of marine protected areas (MPAs), designated by the 1999 Marine Life Protection Act, is the largest in the country. Over a third of the MPAs statewide are located in Southern California. These special places balance conservation of coastal habitats and important species with opportunities for public access. Many of the MPAs in Southern California are open for a variety of recreational activities, from swimming and SCUBA diving to fishing. Ensuring these areas continue to both protect coastal ecosystems and provide recreational opportunities requires that special measures be taken to protect them.

Artificial lighting is a concern all along the coastline, but additional measures should be taken to reduce or eliminate artificial lighting near MPAs. Especially in Southern California, where many MPAs are adjacent to densely populated areas, local property owners should carefully consider the potential environmental impacts when deciding if, where, and how to install lighting near the shore. Due to the cumulative effects of light pollution, even a small amount of additional lighting can cause problems.

Reducing artificial lighting is one important way we can protect the species that call the shoreline home, and be good stewards of California's majestic coastal environment.

To learn more

- In addition to Orange County Coastkeeper, there are several NGOs in the Southern California region who can serve as a resource, including: Heal the Bay, Wildcoast, LA Waterkeeper, and Santa Barbara Channelkeeper

For more information on the effects of light pollution on coastal marine life, please visit:
http://www.opc.ca.gov/keep-the-night-on/

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