

Tackling Light Pollution

LESSONS FROM PUERTO RICO

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A leatherback turtle nests on Ocean Park Beach in San Juan, Puerto Rico. An island-wide program has sought to minimize lighting impacts on nesting and hatching turtles, including through the use of turtle-friendly lighting, seen here. © Siete Quillas

Light pollution—the inappropriate or excessive use of artificial light that can take the form of glare, light trespass, sky glow, or clutter—is a threat to sea turtles globally (to learn why, see FAQs on p. 38), as well as to many other species including humans. Addressing light pollution has become an increasingly important challenge on a rapidly developing planet where true, natural darkness has become a rare commodity.

On the Caribbean island of Puerto Rico, permits for urban and touristic construction in coastal areas have more than doubled in the past five years, and the associated light pollution has become a grave threat to the sea turtles that nest on nearby shores. On beaches near the capital city of San Juan, for instance, nearly all nesting and hatching turtles would be bathed in disorienting artificial light at night were it not for the efforts of community conservation groups to relocate nests and to use light shades and tarps to redirect hatchlings toward the sea. In response to public concerns, legislation was approved in 2008 (Law 218 for the Control and Prevention of Light Pollution) that included specific regulations for properties adjacent to sea turtle nesting beaches. However, enforcement has been lax owing to legal ambiguities and a lack of regulatory personnel.

A Program to Retrofit Lighting

In 2020, a lighting retrofit program funded by the National Fish and Wildlife Foundation was developed as part of the Leatherback Sea Turtle Habitat Restoration Project, which is led by the National Wildlife Refuge Association in collaboration with the Puerto Rico Department of Natural and Environmental Resources (PR-DNER) and several community-based sea turtle conservation groups. The program pursues the following seven-step process:

- 1 Perform nighttime surveys to identify sources of light pollution, which will include collecting GPS locations and photographs.
- 2 Conduct daytime property visits to inventory beachfront light fixtures that should be replaced with more turtle-friendly models.
- 3 Invite property owners to voluntarily comply with lighting changes, which will include receipt of technical advice and of free-of-charge, turtle-friendly lighting.
- 4 Provide expert-designed lighting retrofit plans for the properties whose owners agree to comply.
- 5 Have property owners sign a letter of commitment that describes the roles and responsibilities of compliance with the program.
- 6 Give property owners 45 days to comply with the lighting retrofit plan.
- 7 Present a certificate from the PR-DNER Light Pollution Office to properties that comply and voluntarily participate in the retrofit program.

If property owners do not agree to take action to mitigate light pollution for which they are responsible or if they refuse to participate in the free assistance offered by the program, their case is referred to the PR-DNER Light Pollution Office for punitive action.

Since the launch of the program, 90 properties in 15 coastal municipalities have participated, including private residences, condominiums, nature reserves, municipal parks, and even commercial properties such as hotels, Airbnbs, and restaurants.

As a result, there has been measurably less light pollution on Puerto Rican sea turtle beaches.

Lessons Learned

A number of valuable lessons have been learned from the initial year of the lighting retrofit program that can help others who choose to take on similar efforts. Those lessons include the following:

- Start by working on legislation to regulate light pollution in your region if laws do not already exist. Even though the enforcement of Puerto Rico's law has been weak, it nonetheless provides a legal framework that serves as a strong incentive for participation.
- Conduct education campaigns and prepare to provide technical assistance. This approach is especially important with businesses such as hotels and resorts that are common sources of light pollution near sea turtle beaches in the Caribbean. Offer safe alternatives, and consider developing a program to reward compliance.
- Secure funds to subsidize lighting retrofits, and clearly define priorities and set criteria for who should receive free technical and material support.
- Conduct outreach among property owners that aims to educate them not only about sea turtles, but also about the importance of good lighting practices for improving safety, saving energy, and improving public health (for example, excessive artificial light is linked to anxiety, depression, and poor sleep quality). Outreach campaigns should highlight the benefits of smart lighting practices and demystify the popular belief that more lights promote safety—most crimes reported in Puerto Rico have occurred not at night, but rather from 8:00 to 11:00 a.m.
- Recommend certified turtle-friendly lights (minimum of 560 nanometers), because not all amber or red lights meet turtle-safe standards.
- Listen to and consider peoples' concerns and needs, and find ways to please the people. For example, humans often prefer amber over red lights, a preference that can be easily accommodated.
- Once the retrofit is complete, follow up with property owners periodically to build and maintain long-term relationships. This contact might include phone calls, holiday cards, or check-up visits.

Future Challenges

The big question facing Puerto Rico's lighting retrofit program is whether its work can be sustained for the long term. The program must be reinforced not only by effective enforcement of the law, but also through ongoing efforts in education, awareness campaigns, and local capacity building. Those efforts will require help from various sectors ranging from government professionals to local communities and nonprofit partners. Hopefully, the work done thus far has generated a long-term change in attitudes and behaviors among property owners and program participants. Although the effort and money invested to date has paid off in reduced light pollution at sea turtle beaches, the work must continue to sustain and expand on such successes. •