

Turtle-Friendly Lighting 101: Handbook Index



SESCO Lighting

Lighting Fixture Classifications:	Page Number
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CUT SHEETS - To obtain cut sheets simply scroll down to pages 8-14, then click on the fixture you desire.

Sesco Lighting Manufacturers Included in Handbook:



DISCLAIMER:

Photos in this handbook are used as reference only and may be shown without amber LEDs. All fixtures must include amber LED's or other approved lamp in order to comply with the FWC Turtle-Friendly lighting requirements. Manufacturer cut sheets are subject to change without notice. Contact your local SESCO Lighting Sales representative for further information or visit our website at www.sescolighting.com.

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Turtle-Friendly Lighting 101: *The Problems*

According to the Florida Department of Environmental Protection:

“Sea Turtle populations have suffered worldwide declines, and their recovery largely depends upon our managing the effects of expanding human populations. One of these effects is light pollution - the presence of detrimental artificial light in the environment. Of the many ecological disturbances caused by human beings, light pollution may be among the most manageable. Light pollution on nesting beaches is detrimental to sea turtles because it alters critical nocturnal behaviors, namely how each turtle chooses nesting sites, how they return to the sea after nesting and how hatchlings find the sea after emerging from their nests.”

FMRI Technical Report TR-2

Sea turtles have been nesting on our sandy beaches for millions of years. In the past, their hatchlings were able to find the ocean by crawling away from the dark silhouettes of the dunes and toward the brighter horizon of the night sky reflecting off the ocean. Now, in many places, the sky over the dunes is the brighter horizon, lit up by thousands of artificial lights. This causes problems for the hatchlings, which end up crawling away from the safety of the ocean and towards the dangers of dehydration, predators and the street. It also causes similar problems for the mother turtles that, once they navigate ashore to lay their nests, become confused by the lights and cannot find the sea to return to it.

Courtesy of Lights Down for Wildlife



Courtesy of www.picasweb.google.com

Turtle-Friendly Lighting 101: The Solutions



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To protect our precious sea turtles, the Florida Fish and Wildlife Conservation Commission reviews all construction projects currently being built along Florida's coastline. The FWC's goal is to work along side the project design team and review the lighting throughout the design process and make comments on all exterior lighting fixtures before installation. Their goal is to ensure that specified lighting fixtures comply with the recent discoveries made concerning a turtle's natural behavior and artificial lighting.

Turn it OFF - If the light isn't necessary for safety, this is the simplest and cheapest solution! For aesthetics, rely on the stars in the night sky.

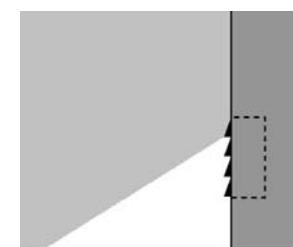
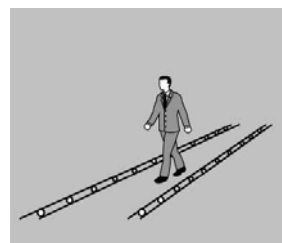
For each outdoor lighting fixture that is needed for safety reasons and cannot be turned off, simply implement **ALL THREE** of these solutions **TOGETHER** to reduce the light's impact:

Keep it LOW - Both in height and in wattage. The shorter the fixture, the more hidden it will remain by the dune or beach profile. The lower the wattage, the less bright the light will be.

Keep it SHIELDED - So much light and energy is wasted when light is scattered up into the sky. Use fixtures that shield the lamp (the source of light) and direct the light to where you need it, on the ground.

Keep it LONG - Long wavelength, that is. The yellow and red end of the light spectrum is less disruptive to turtles and some other wildlife. That doesn't mean it's invisible, that's why it's important to keep it low and shielded as well.

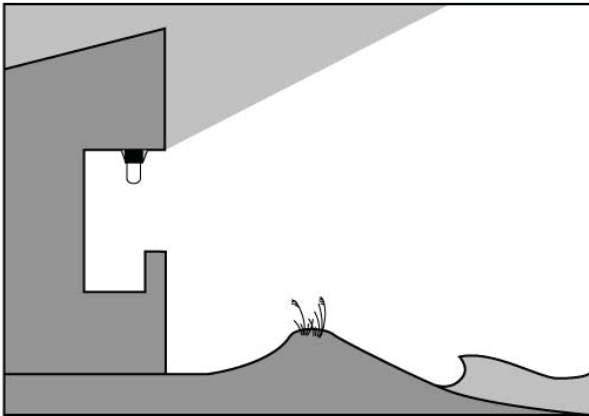
*Courtesy of B.E. Witherington and R.E. Martin.
FMRI Technical Report TR-2*





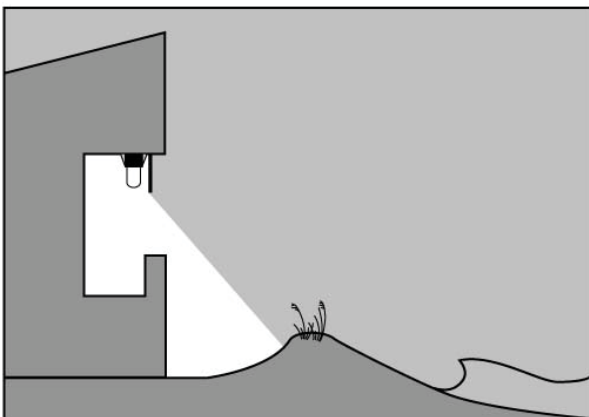
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Turtle-Friendly Lighting 101: *The Solutions*



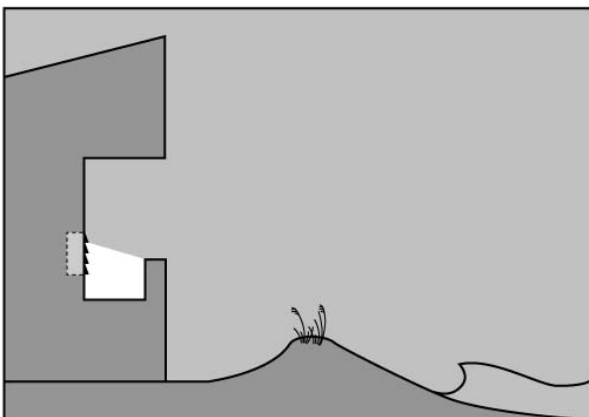
POOR

Poorly directed balcony lighting can cause problems on sea turtle nesting beaches.



BETTER

Completely shielding fixtures with a sheet of metal flashing can reduce stray light reaching the beach.



BEST

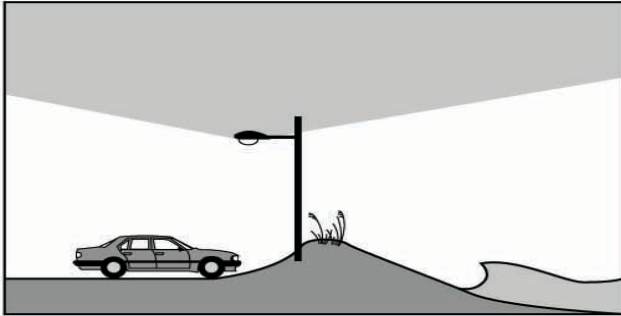
Louvered step lighting is one of the best ways to light balconies that are visible from nesting beaches.

Courtesy of B.E. Witherington and R.E. Martin. FMRI Technical Report TR-2

Turtle-Friendly Lighting 101: The Solutions

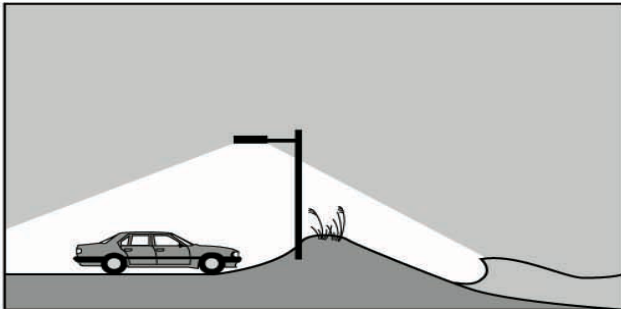


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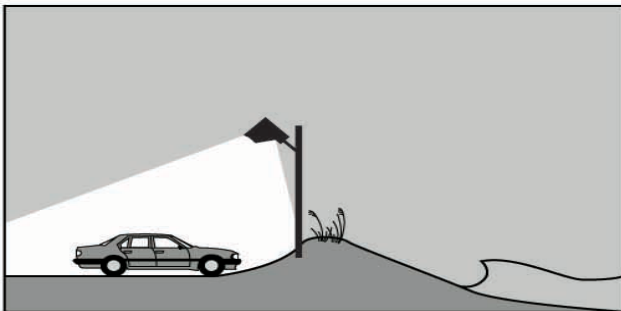
POOR

Poorly directed parking lot lighting can cause problems on sea turtle nesting beaches.



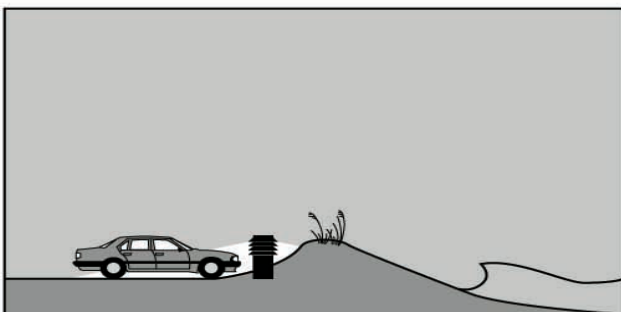
BETTER

Fixtures with 90 degree cut off angles can reduce the amount of stray light reaching the beach.



MUCH BETTER

Fully hooded floods can direct light accurately and reduce stray light even more.



BEST

Low-mounted, louvered bollard fixtures are the best way to light parking lots near nesting beaches.

Courtesy of B.E. Witherington and R.E. Martin. FMRI Technical Report TR-2



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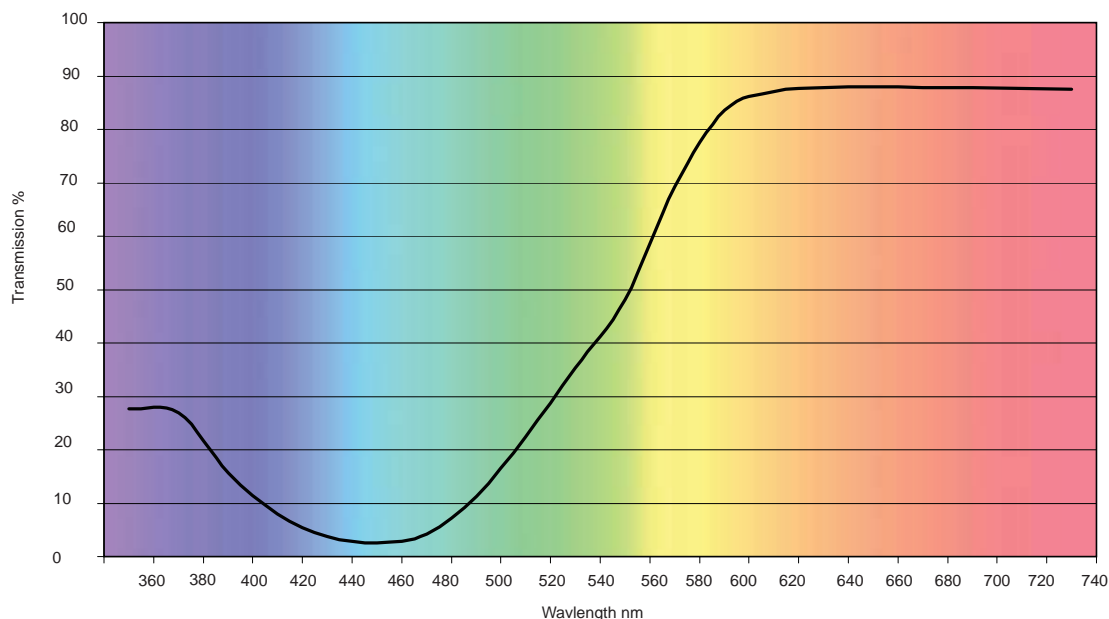
Turtle-Friendly Lighting 101: Wavelength

WAVELEGTH

Studies have found that baby sea turtles have an innate sense to follow the brightest element in the sky in order to guide them safely into the water immediately after hatching. Ideally, the brightest element in the night sky should be the moon, but this is often not the case when artificial light is used near a sea turtle nesting beach.

Studies have also found certain wavelengths of light have minimal affect on sea turtles. Light sources emitting higher wavelengths (those in the yellow or red in color) have less affect on turtles than the lower wavelengths of visible light (in the violet or blue spectrum). Moonlight falls within the blue/violet spectrum of lower wavelengths.

The below chart is a sample of a Rosco color filter in "medium amber." In the past, the Florida Fish and Wildlife recommended the use of lamps that were coated in a yellow, amber or red color filter. We typically called these lamps "bug lamps." However, the FWC is now recommending that we DO NOT use these color filters because they still allow a small quantity of light to be emitted in the lower wavelengths. For example, as you can see in the chart below, the majority of light for this amber filter is emitted in the 560+ wavelengths. However, there is still a small spike in the 360-380 wavelength. This amber color filter allows a transmissivity of 20-30% in the lower wavelengths. These lower wavelengths, in the "cool" tones, mimic moonlight, and can confuse the turtles. Consequently, these filters are better than a normal exposed lamp but they are not the best solution.



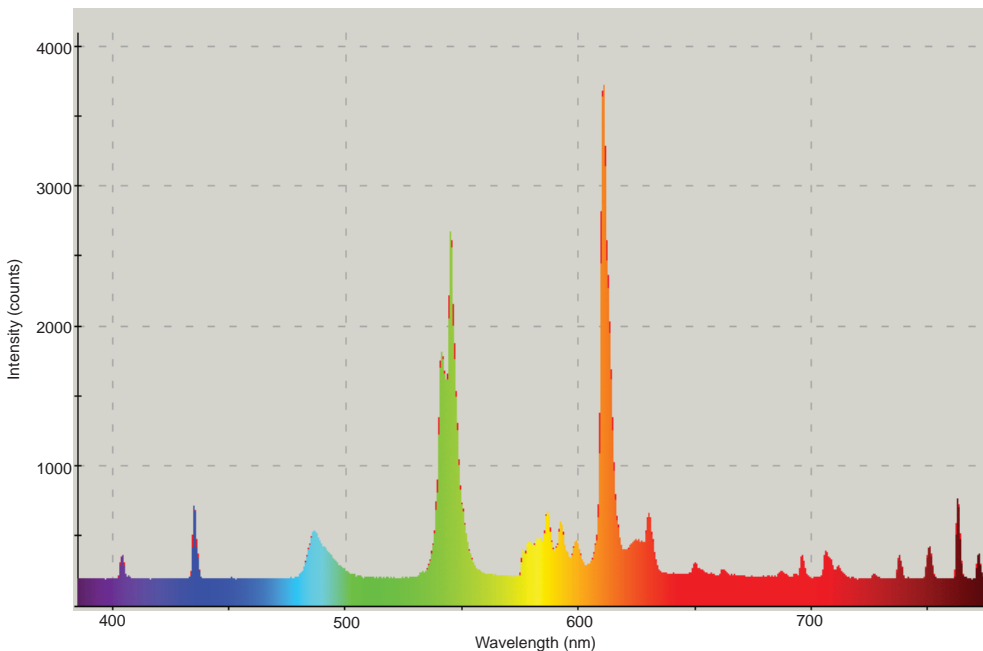
Turtle-Friendly Lighting 101: Color



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AMBER VS COLOR

For lighting projects that face turtle nesting beaches, the best solutions are low pressure sodium lamps, amber LED's or red LED's. Below is a chart of a typical amber LED. As you can see, the majority of light peaks in the 580-620 wavelength with virtually no light in any other wavelength. We call this type of lighting "monochromatic" due to its ability to eliminate other wavelengths. Low pressure sodium lamps are also considered monochromatic. Therefore, the Florida Fish and Wildlife prefers these types of light sources when shielded properly for use within the vicinity of turtle nesting beaches.



To the left is a wavelength chart. As you can see, the amber LED only creates wavelengths in the 580-640nm visible spectrum. Therefore, the Amber LED works better at eliminating the wavelengths that disorient the sea turtle hatchlings in lieu of a color filter or gel on a lamp or fixture.



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Turtle-Friendly Lighting: *Wall Mounted Fixtures*



101_Arc Lighting



102_BK Lighting



103_Gardco



104_MP Lighting



105_MP Lighting



106_Martini



107_Martini



108_Prisma

Turtle-Friendly Lighting:

Recessed Wall & Step Niche Fixtures



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201_Arc Lighting



202_Arc Lighting



203_BK Lighting



204_BK Lighting



205_BK Lighting



206_BK Lighting



207_BK Lighting



208_Bega



209_Bega



210_Bega



211_Bega



212_Bega



SESCO Lighting

Turtle-Friendly Lighting:

Recessed Wall & Step Niche Fixtures



213_Bega



214_Bega



215_Belfer



216_Gardco



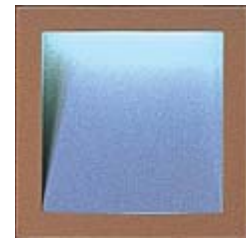
217_Gardco



218_Gardco



219_Gardco



220_Martini



221_Phoenix



222_Prisma

Turtle-Friendly Lighting: Bollard & Pathway Fixtures



SESCO Lighting



301_Arc Lighting



302_BK Lighting



303_BK Lighting



304_Bronzelite



305_Bronzelite



306_Gardco



307_MP Lighting



308_Phoenix
Intrigue



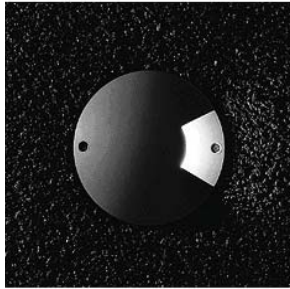
309_Prisma



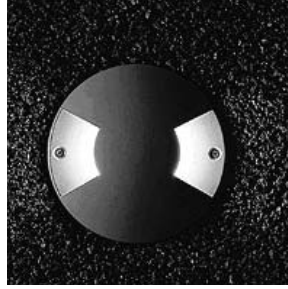
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Turtle-Friendly Lighting:

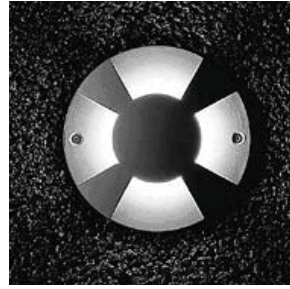
Recessed In-Ground Fixtures



401_Martini



402_Martini



403_Martini



404_Martini



405_Martini



406_Prisma



407_Solavanti

Turtle-Friendly Lighting: *Garage & Ceiling Mounted Fixtures*



SESCO Lighting



501_BK Lighting



502_BK Lighting



503_Phoenix Intrigue



SESCO Lighting

Turtle-Friendly Lighting: *Roadway & Area Lighting*



601_Sternberg



602_Gardco



603_Schreder