

FWC SEA TURTLE LIGHTING GUIDELINES

These guidelines provide general information for all property owners living adjacent to sea turtle nesting beaches, but they are specifically designed to help property owners required to avoid and minimize lighting impacts to sea turtles as part of the State permitting programs, such as Coastal Construction Control Line (CCCL) permits and Environmental Resource Permits (ERP). In the permitting process, property owners must minimize all lights that may be visible from the beach, including all exterior, structural, decorative, and landscape lighting. This includes interior light visible through glass windows, doors and walls (either facing or perpendicular to the beach) as well as light from pools, fire pits, electronic devices such as televisions, tiki torches, etc.

FWC recommends beachfront property owners follow the **three golden rules**, “**Low-Shielded-Long**” when installing or modifying lights. All three must be used in combination to be effective, as they are all equally important!

KEEP IT LOW

- Fixtures must be mounted as **low as possible** to achieve required light levels.
- Bulbs must produce the **lowest wattage/lumens** necessary for the needed purpose.

KEEP IT SHIELDED

- Fixtures must be completely downward-directed.
- Fixtures must shield the bulb, lamp, or glowing lens from the beach.

BAD EXAMPLE: Unshielded bulb



GOOD EXAMPLE: Shielded bulb with Amber LED (long-wavelength, 560 nm or higher)



KEEP IT LONG

- Lamp/Bulb must produce only **long wavelength light** (560 nm or greater, which is amber, orange, or red)
 - **The Best Current Technology:** Red LED, Orange LED, Amber LED, Low Pressure Sodium (LPS)
 - Please note, phosphorus converted bulbs, such as PC amber bulbs are not true long wavelength light sources, since there are wavelength readings below 560 nm.

BAD: Incandescent bulb



GOOD: Amber Bulb (long-wavelength, 560nm or higher)



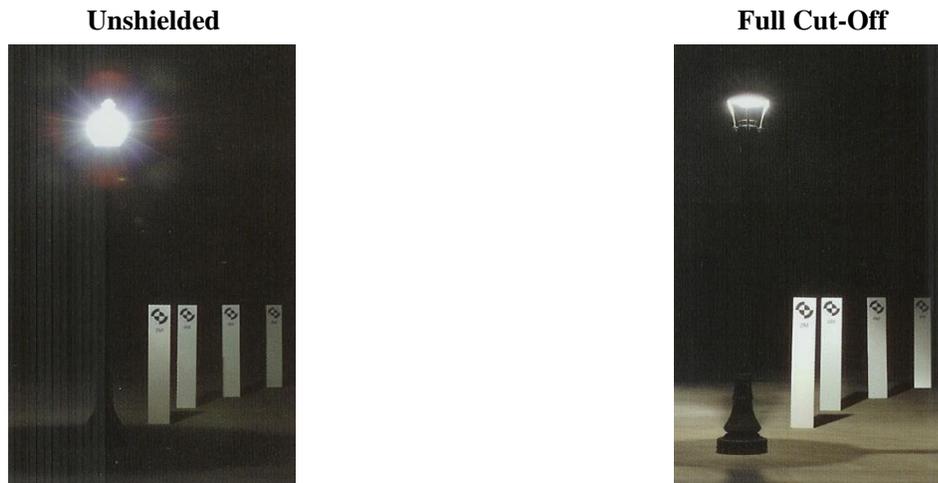
Acceptable Fixtures

All exterior lights proposed for the seaward or shore perpendicular side of the structure should be well-shielded, full cut-off, downward directed fixtures with a long-wavelength light source (wavelength readings of 560 nanometers (nm) or higher).

If the exterior fixtures on the landward side of the structure are **not** visible directly or indirectly from the beach, they are only required to be downward directed.

How effective are full cut-off fixtures?

Below, look at an unshielded fixture and a full cut-off fixture side-by-side. The acorn light on the left wastes about 60% of the light into the sky. The one on the right is a full-cut off fixture with a recessed bulb, which provides more light on the ground. This is a good example of how full-cut off fixtures are not only good for sea turtles, but also for human safety because they direct light where it is needed, on the ground. To make the full cut-off example even better, it should be fitted with a shield that blocks light on the beachside and a long-wavelength lamp/bulb.



Acceptable Lamps / Bulbs

All fixtures visible from the beach should have a long-wavelength lamp – a bulb that looks amber or red because it only produces light with wavelengths of 560 nm or higher. White light such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps can disorient nesting sea turtles and their hatchlings, leading them away from the water. The following fixtures will minimize – but not totally remove – the risk of disorientation if properly installed in a well shielded, downward directed fixture.

- Low Pressure Sodium (LPS): 18W, 35W
- Red, Orange or Amber LED (true red, orange or amber diodes, NOT FILTERS)
- True red neon
- Other light sources that produce light of 560 nm or greater

HINT: LEDs tend to be much brighter than incandescent bulbs, so be sure not to over light an area!

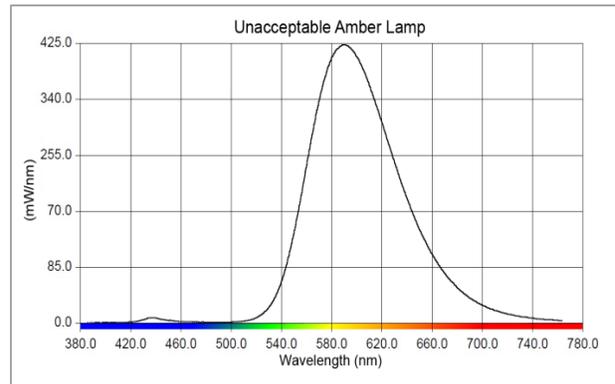
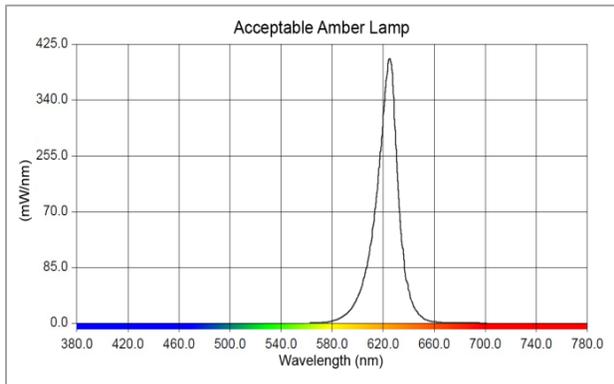
Upon review and approval by FWC, use of shorter wavelength lights may be allowed in limited areas where direct and indirect light or glow would not be visible from the beach.

A list of the Florida Fish and Wildlife Conservation Commission's Certified Wildlife Lighting, which includes acceptable lamps/bulbs for fixtures, can be found [here](#).

How can I tell if it is a long-wavelength light source?

Specifications for the wavelength is available from the manufacturer. Specifically, you can request a spectral distribution graph, as seen below.

The graph on the left displays an **acceptable** wavelength reading for a long-wavelength light source (i.e. amber lamp), with wavelength readings above 560 nm or higher. The graph on the right displays an **unacceptable** wavelength reading, with wavelength readings below the 560 nm cutoff.



Minimizing Light

Even though a fixture/lamp combination may be Low-Shielded-Long, too many fixtures may still result in sea turtles becoming disoriented. In addition to the lowest wattage necessary for safety, light can also be minimized by installing fewer fixtures.

- Use the lowest wattage necessary.
- Use a minimal number of fixtures.
- Use only if needed for safety.

Why do I need to minimize long-wavelength light?

A common misconception is that long-wavelength lighting (i.e. LPS, Red, Orange or Amber LEDs) is not visible to sea turtles. This is FALSE. Long-wavelength lighting is less disruptive than white light, but even long-wavelength lighting that is too bright may cause impacts to sea turtles and their hatchlings! Therefore, we recommend only utilizing lights that may be visible from the beach if there are state or federal requirements for specific light levels to ensure public safety (such as stairs or egress/ingress walkways).

We **do not recommend** the following types of lighting, since they are not needed for safety:

- Private balcony lights
- Pond lights
- Tree Strap Downlights
- Fountain lights on seaward or shore perpendicular side of a structure
- Up lights
- Dune Walk over lights
- Decorative Lighting

Impacts from interior lighting

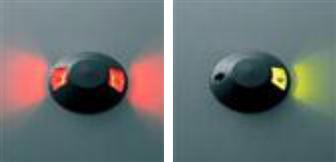
State rules require that tinted glass or film with a visible light transmittance value of forty-five (45) percent or less (inside to outside) must be used on all glass windows, doors and walls within line of sight of the beach, usually the seaward and shore-perpendicular sides of the structure. However, since those rules were passed, there are now better options because of advances in tinting and more information on sea turtle disorientations. Window tints/film with transmittance values lower than 45% are available that are energy efficient, pleasing and easily seen through. The best option for minimizing lighting impacts to sea turtles is 15% transmittance, with 25-30% transmittance the most popular. Many local lighting ordinances require that interior lights cannot be visible from the beach; therefore, the use of higher transmittance tints (such as 45%) often requires installation of additional window treatments to achieve compliance with the ordinance.

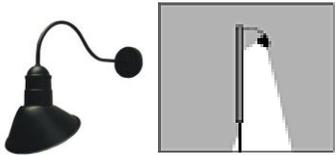
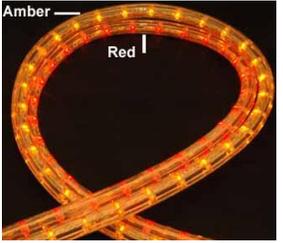
If the information above is followed, your home or building is not expected to adversely impact nesting sea turtles, their hatchlings or their habitat. Thank you for doing your part to protect Florida's sea turtles!

*Please email Wildlifelighting@MyFWC.com if you need additional information or help.

EXAMPLES OF TURTLE FRIENDLY FIXTURES

FIXTURE	LAMP & WATTAGE	MOUNTING TYPE & HEIGHT	LOCATION	COMMENTS and/or ADDITIONAL REQUIREMENT
<p>Ceiling Mount Cylinder (with interior black baffles)</p> 	<p>Red/orange/amber LED</p>	<p>Ceiling Surface</p>	<p>If located on shore perpendicular or beach side of structure allow on <u>ground floor</u> only</p>	<p>Interior Black Baffles</p>
<p>Wall Mount Cylinder Down Light (with interior black baffles)</p> 	<p>Red/orange/amber LED</p>	<p>Wall Mount Downward Directed 8 ft from floor</p>	<p>If located on shore perpendicular or beach side of structure allow on <u>first habitable floor</u> only</p>	<p>Interior Black Baffles Hex cell louvers may be required to decrease wall wash</p>
<p>Recessed Ceiling Canister</p> 	<p>Red/orange/amber LED</p> <p><u>The following short wavelength lamps may only be used for covered driveway entry on landward side of structures</u></p> <ul style="list-style-type: none"> • Halogen lamp • PAR spot lamps • LED lamps • HPS lamps • Compact Fluorescent 	<p>Recessed Ceiling</p>	<p>If located on shore perpendicular or beach side of structure allow on <u>ground floor</u> only</p>	<p>Interior black baffles Hex cell (honeycomb) louver</p>

<p>Recessed and Wall Mounted Step Lights (louvered or downward directed)</p> 	<p>Red/orange/amber LED</p>	<p>Wall Mount</p> <p>Maximum height 24 inches on Ground Floor only</p> <p>Above Ground Floor Max height 12 inches</p>	<p>Ground floor, second level, and pool Deck</p>	<p>If on perimeter of pool deck, must be mounted directed away from beach.</p>
<p>Bollard (with downward directed louvers)</p> 	<p>18w LPS</p> <p>Red/orange/amber LED</p>	<p>Maximum height 42 in</p>	<p>Parking areas, commercial walkway, landscape, pathway and pool deck</p>	<p>180° to 270° beach side shields on any fixture on perimeter of pool deck or immediately adjacent to beach.</p>
<p>High Intensity Full Cut Off Pole Lights</p> 	<p>18-35 w LPS (if twin head, maximum of 36w total)</p> <p>Orange/amber LED</p>	<p>Pole - maximum height 12 feet</p>	<p>Parking area</p> <p>Landward side of structure only.</p>	<p>Beach side shields and/or louvers for any fixture within line of sight of beach.</p>
<p>Paver Lights</p> 	<p>Red/orange/amber LED</p>	<p>In ground mount</p>	<p>Parking areas, driveways, pathways, pool decks</p>	

<p>Landscape/Pathway Lighting</p> 	<p>Red/orange/amber LED</p>	<p>Ground mount Maximum height 12 inches</p>	<p>Ground Level, landscape</p>	
<p>Signage</p> 	<p>Red/orange/amber LED</p>	<p>Must be mounted with light directed <u>down</u> on to sign. NOT UP</p>	<p>Sign should be on landward side of structure when possible and mounted perpendicular to the beach.</p>	
<p>Garage Lighting (Phoenix)</p> 	<p>35w LPS Amber/Orange/Red LED</p>	<p>Garage Ceiling</p>	<p>Garage</p>	<p>If a parking garage is not fully enclosed with solid walls, without windows, louvers, or screens so that the interior is not visible from any section of beach, only LPS or amber/orange LED lamps shall be used. Additional shields may be necessary if parking is above ground level.</p>
<p>Channel / Rope Lighting</p> 	<p>Red/orange/amber LED</p> <p><u>NOT colored plastic tubing with white lights</u></p> <p><u>No White LED</u></p>	<p>Must be mounted recessed under steps, bar, etc. and directed <u>down</u> to assure that light source or reflected light is not visible from beach</p>	<p>Pool deck, steps, pool bars.</p>	

<p>Water Feature Lighting</p> 	<p>Red/orange/amber LED</p>	<p>Light must be downward or horizontally directed</p> <p><u>DO NOT direct light up</u></p>	<p>Submerged lights are only allowed on landward side of structure and only if fully shielded from beach by structure</p>	
<p>Underwater Swimming Pool Lighting</p> 	<p>Red/orange/amber LED</p>			
<p>Emergency Egress Lighting</p> 	<p>Red LED Exit signs</p> <p>Full cut off downward directed Emergency egress fixtures may use short wavelength lamps</p>			<p>Short wavelength lamped emergency egress fixtures must be specified on fixture schedule and plans to be on separate circuit that will only illuminate fixtures during power outage</p>