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#### **Publication Date**

2007-05-20

## **DARK BEACHES - FDOT'S CONTINUED EFFORTS TO IMPLEMENT ENVIRONMENTALLY SENSITIVE LIGHTING SYSTEMS**

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### **Abstract**

Artificial lighting has two important effects on sea turtles: It reduces the attractiveness of the beach to nesting females, and thus decreases the number of turtles which place nests in a coastal region, and; it interferes with the hatchlings ability to orient normally from the nest to the ocean.

Both of these effects depend upon the overall intensity (energy content) and spectral composition (concentration of heat energy as a function of wavelength) of the light source(s). Habitat alterations associated with FDOT coastal highways contribute to many beach lighting problems. The existing Florida Department of Transportation (FDOT) Roadway Lighting Standards do not take into account the biological conditions of adjacent properties when developing roadway lighting systems.

This problem was identified in the FDOT 2020 Long Range Transportation Plan which was approved by Secretary of Transportation Ben Watts and the Florida Transportation Commission in March 1995. The 2020 Long Range Plan suggested that FDOT incorporate the findings of the ecosystem management task force into Department procedures, including such ideas as identifying critical sea turtle nesting habitat where alternative street lighting could be installed. In 1998, FDOT entered into a research study with Florida Atlantic University (FAU) that would address the impacts of coastal roadway lighting on adjacent sea turtle nesting beaches. Originally, the purpose of this study was to (i) identify coastal roadway lighting problems, (ii) determine how they can be corrected, and (iii) use this information to develop new and improved lighting standards for roadway design engineers, coastal communities and utility companies. It was expanded to include an embedded roadway lighting demonstration project as well as an evaluation of the safety and roadway user response to embedded roadway lighting that was conducted by the Department of Civil and Coastal Engineering at the University of Florida (UF). These findings were presented at the 2001 ICOET conference in Keystone, Colorado. A recommendation of the UF research study was the need for the development of an Engineering Manual for Designing Roadway Lighting Systems in Environmentally Sensitive Areas. The manual would not necessarily offer new lighting criteria, but would show the designer how to use alternative lighting products in the design of coastal roadway lighting systems. It was determined that this would be a valuable resource for Florida and for the nation (Ellis and Washburn, 2003). The manual would allow the implementation of specialized Coastal Roadway Lighting Standards that would meet the needs of the roadway and satisfy the requirements of the Endangered Species Act.

The purpose of this paper is to provide an overview of this latest implementation of FDOT sponsored research to address coastal roadway lighting and its impacts on adjacent sea turtle nesting beaches. This recent project is a work in progress with anticipated completion date of September 2007.