THE IMPACT OF ARTIFICIAL LIGHT AND STRUCTURES ON NEARSHORE DISPERSAL AND PREDATION RATES OF TURTLE HATCHLINGS

Phillipa Wilson | Michele Thums | Scott Whiting | Kellie Pendoley | Mark Meekan | Charitha Pattiaratchi

The University of Western Australia and Australian Institute of Marine Science | Australian Institute of Marine Science | Department of Biodiversity, Conservation and Attractions | Pendoley Environmental | Australian Institute of Marine Science | The University of Western Australia

After hatching, neonate turtles entering the water are thought to orientate away from shore into the open ocean using a combination of wave direction and visual (light) cues. Light pollution may interfere with this process by attracting hatchlings at sea, but the relative importance of natural and anthropogenic cues to the dispersal of hatchlings is unknown, as is the impact of attraction to artificial light on survival. Here, we used passive acoustic telemetry to track the in-water movement of flatback turtle (*Natator depressus*) hatchlings dispersing through nearshore waters off Thevenard Island, Western Australia. We tagged turtles using acoustic tags and followed their dispersal offshore from beaches through a receiver array in the presence and absence of artificial light at two sites; one over a nearshore reef platform and one at a site with a jetty. At the reef platform site, we used Generalised Additive Mixed Models to show that artifical light reduced the swim speed of the hatchlings, increased the amount of time they spent in nearshore waters and increased the variance in bearing (a measure of the ability to orientate directly), regardless of oceanographic conditions. Under ambient conditions, ocean currents affected the bearing of hatchlings as they left the shore, but when light was present, this effect was diminished, showing that turtles actively swam against currents in their attempts to move towards the light, thus likely exacting energetic consequences. Although light affected hatchling navigation at the reef platform site, we could not test the effect of light on dispersal at the jetty because 70% of the tagged hatchlings released at this site were immediately consumed by predators. Evidence for consumption was provided by tag detachment or the extensive movement of the tags in the receiver array suggesting that the tag (and turtle) was inside the stomach of a predator. We found that 70% of these mobile predators that consumed tags used the jetty as a daytime refuge and expanded their range after dark. Sampling of candidate species (lutjanid reef fishes) under the jetty revealed the presence of turtle hatchlings in their gut contents. We showed that nearshore structures increased the mortality of hatchlings independent of the presence of artificial light, with mortality likely increased on lighted structures due to hatchlings' attraction to the light and their slow dispersal speeds through the high risk areas.

This book is tentative Proceedings of the 38th Annual Symposium on Sea Turtle Biology and Conservation

38th Annual Symposium on Sea Turtle Biology and Conservation Presentation Abstracts

18-23 February 2018
Kobe International Conference Center, Kobe, Japam
Main Theme: Beyond Protection of Sea Turtle