EXPERIMENTAL STUDY ABOUT THE IMPACT OF ARTIFICIAL LIGHTING ON LOGGERHEAD FEMALE NESTING IN CAPE VERDE

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Abstract

Artificial illumination of nesting beaches is one of the main threats to endangered sea turtle populations. Nocturnal lighting can impair female nest site selection and nesting success, as well as behavior and hatchling survival in their way from the nest surface to the seashore. The island of Boavista (Cape Verde) hosts the third largest loggerhead nesting aggregation in the world and the only relevant population in the Eastern Atlantic coast. Several threats such as fishing by-catch and female slaughter during nesting are severely threatening its conservation. Tourism development in the emerging archipelago of Cape Verde is the basis of economic developments and social development (mainly on the islands of Sal, Boavista and Maio) but could have negative impacts on nesting population of Caretta caretta due to increased lighting of hotels, streets and vehicles in coastal areas. So it is important to devise a strategy for sustainable development, assessing the impact of artificial lighting on nesting beaches of C. caretta in Cape Verde. Currently the few beaches of Boa Vista that hosts villages or touristic resorts that cause nocturnal pollution almost have no significant turtle nesting activity. More than 99% of loggerhead nesting on the island occurs on beaches without sources of light during the night. However, the lack of long-term data about loggerhead nesting does not permit to establish a cause-effect relationship among nocturnal lighting and low nesting activity on urbanized beaches. The present study was conducted on the island of Boavista, in order to evaluate the impact of artificial light on the loggerhead nesting. We tried to identify types of environment friendly lighting that have low impact on turtle nesting, and thus could contribute to the development of tourism compatible with conservation of sea turtles. The study was conducted on undisturbed nesting beaches without any type of artificial light in the southeast of the island during the month of September 2010. A small source of artificial light directed to the sea was installed on the center of every beach. We alternated nights with white, red (red filter covering the white light) and no light and studied loggerhead nest site selection, nesting behavior and success as a function of the type of artificial light. During the 28 nights of study, the mean daily number of nests on nights with white light (0.55 nests) was less than half of the men daily nests laid during nights with red lights or darkness (1.28 nests). Due to the high variability on the daily number of nests, these differences were not statistically significant. Without light or with red light the nests were randomly scattered along the beaches. However, during nights with white light the nests were concentrated on the extremes of the beaches, far from the light source. The mean distance between the nest and the light source significantly varied among light treatments ($P<0.01$). Females clearly avoided white lights and red lights significantly reduced female avoidance behavior.