

Conservation challenges for nesting loggerhead turtles in the face of coastal development in southeastern Brazil

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The loggerhead sea turtle (*Caretta caretta*) is the most abundant nester of all five nesting species known to visit the beaches of Brazil. Based on mtDNA analysis, the loggerhead population in Brazil is believed to be subdivided into three major lineages, a northern group which includes the rookeries of Sergipe and Bahia and a southern group, which is subdivided into the rookeries of Espírito Santo and Rio de Janeiro state. Like many marine turtles, global declines of loggerhead nesting populations seriously threaten the sustainability of wild populations. The establishment of the Brazilian Sea Turtle Conservation program, Projeto Tamar, in the early 1980's has significantly improved the survival and recovery of sea turtles through the development of community based programs and protection of nests in main nesting areas using a variety necessary strategies or techniques.

The beaches of the state of Rio de Janeiro, and to a lesser extent, beaches of Espírito Santo are particularly important for the loggerhead populations in Brazil due to historically cooler nesting temperatures resulting in a preponderance of male hatchlings produced in these areas compared to other adjacent beaches.

Although Brazilian law protects turtle nesting areas, this has not prevented the undertaking of large construction projects along the northern Rio de Janeiro coast such the building of the Açu Superport in 2008, and continued expansion of urban areas. The rapid and recent development of this region of Brazil has escalated the risk for loggerhead turtles through increased recreational activity, loss of nesting sites, light pollution, and dredging operations.

Since 2011, Projeto Tamar and Fairfield University have engaged in a partnership of education and research. Together, we have examined the biological and conservation aspects of loggerhead populations within the state of Rio de Janeiro. Given the importance of these beaches for the viability of loggerhead populations and its continued urban development, we have focused our attention on 1) assessing the effects of light pollution on hatchling seaward orientation, 2) monitoring incubation temperatures of both *in situ* and translocated hatchery nests,

3) assessing orientation cues of hatchlings at sea, and 4) examining the effects of dredging operations on turtle strandings.

One of the main objectives of this work is to use the information to aid in the assessment and development of environmental policies and guide current conservation management plans. Here we report our findings on the current state of loggerhead turtles in Rio de Janeiro state. Given the importance of these rookeries in maintaining loggerhead gender ratio as well as the possibility that this particular loggerhead population is a unique genetic subgroup, we suggest that more effort must be devoted to this area in terms of conservation, research, education and policy implementation.

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