

HOPPER DREDGING: A POTENTIAL THREAT TO SEA TURTLES ON THE NORTHERN COAST OF RIO DE JANEIRO

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The northern coast of the state of Rio de Janeiro, eastern Brazil, is an important nesting ground for loggerheads (*Caretta caretta*), with about 1500 nests laid annually. It is also a foraging ground for juvenile green turtles (*Chelonia mydas*) and a migration corridor and possible foraging ground for olive ridleys (*Lepidochelys olivacea*) and leatherbacks (*Dermochelys coriacea*). Despite the key importance of the area, construction began in 2008 for a large private mixed-use port complex, named Açú Superport. To facilitate navigation of various vessels using the port complex, hopper dredges have been used since the beginning of the port construction, for clearing and maintaining access channels, a turning basin, and a harbor basin. In 2012 additional hopper dredges entered into operation for the construction of a new terminal and shipyard. Here we provide an account of sea turtle deaths observed in the region with indications that this mortality was a result of dredging operations during both the port construction and operation. Between 2008 and 2014, a total of 112 individuals were found with injuries indicative of dredging interaction, including two that were found entrained in the hopper dredge draghead. Of these, 68 were green turtles, 26 were loggerheads, 11 were olive ridleys, four were leatherbacks and three could not be assigned a species identification. All turtles with dredging-related injuries were cut in half and/or had parts of their carapace and/or flippers missing. All except two of the loggerheads were adult-sized, reflecting the fact that the northern coast of Rio de Janeiro is a nesting area for this species. Sixty-three green turtles were juveniles, reflecting the importance of the area as a foraging ground for juvenile *C. mydas*. Almost all leatherbacks and olive ridleys taken by the hopper dredge were adults and subadults, which have a higher “biological value”. In order to minimize dredging impacts on sea turtle populations, Projeto TAMAR has provided technical support to the environment agencies for the development of a detailed plan to prevent additional incidental takes. Mitigation measures such as alternative dragheads, deflector equipment, as well as environmental time windows and using dredges other than hopper dredges, have been proposed. Considering these findings and what has been learned so far, even with proper application of all mitigation measures, we strongly discourage hopper dredging operations on sea turtle nesting grounds during nesting seasons. Additionally, in areas of high sea turtle concentration (e.g., foraging grounds) care must be taken to ensure

that there is minimum impact on these animals and other marine species. This study might be used as a reference to assist future dredging project proponents and environmental agencies in the selection of safe and appropriate mitigation measures.