

MOVEMENTS OF BRAZILIAN HAWKSBILL TURTLES REVEALED BY FLIPPER TAGS

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A long-term flipper tag capture-mark-recapture (CMR) study run by Projeto TAMAR-ICMBio, the Brazilian sea turtle conservation programme, was started in 1982, primarily at nesting sites, but since 1989 it has included foraging sites. We document long-range movements associated with transition from one life stage (juvenile) to another (breeding adult) ($n = 3$), or that occurred within a single life stage (developmental migration) ($n = 5$). Three hawksbill turtles tagged as juveniles in Rocas Atoll were recaptured from 9 to 19 years later nesting in the Brazilian mainland, two in Southern coastline of Rio Grande do Norte state (305 and 270 km) and one in Southern Bahia state (1389 km). The time period between the last record on the forage ground and the nesting site records varied from 6.3 to 17.5 years, which may indicate that the minimum period for maturation take place should be at least 6.3 years. Flipper tags more often record movements within the same life stage, these include the reproductive migration of breeding females or developmental migrations of immature turtles traveling between development sites. We also present movements of five immature hawksbill turtles between sites: two from Fernando de Noronha to Rio Grande do Norte (400 km, from 46 cm to 54 cm of CCL in 7 years, stranded on the beach with no signs of the cause of death) and to Ceara (835 km, from 39 cm to no available CCL in 6.8 years killed in a forbidden lobster net), two from Atol das Rocas to Northern Bahia (1073 km, from 46 cm to 76 cm of CCL in 7 years with signs of fishing gear on the left hind limb, identified as a female by necropsy) and to Caribbean, Bermuda (5193 km, from 40 cm to 68.2 cm of CCL in 9 years where it was observed to have ingested a fishhook). For this last turtle, since first capture, the hind left limb was broken, however even with this injury the turtle was able to travel the longest journey yet reported for immature hawksbills tagged in Brazil, once its left hind limb still broken and did not heal properly. As the proper fisherman captured the turtle, it indicates that the individual was not there because of drifting after injured. Stranded animals always bring some suspicion concerning the origin, where they living at place,

where they stranded or did they drift there after being injured. For animals that may disperse over such a vast area, the use of a variety of methods that allow their detection is also needed. Flipper tags are still a very valuable method, as they are very low cost and conspicuous allowing the detection of a tagged animal by any person anywhere.