

A COMPARISON OF LONG-TERM TRENDS IN NESTING ACTIVITY OF *CHELONIA MYDAS*, *ERETMOCHELYS IMBRICATA* AND *DERMOCHELYS CORIACEA* IN TORTUGUERO, COSTA RICA

Emily Grace Webster | Jaime Restrepo | Roldán Valverde

Sea Turtle Conservancy | Sea Turtle Conservancy | Sea Turtle Conservancy

Tortuguero Beach, Costa Rica, hosts the largest rookery for endangered Green sea turtles (*Chelonia mydas*) in the Atlantic basin. Critically endangered Hawksbill (*Eretmochelys imbricata*) and vulnerable Leatherback (*Dermochelys coriacea*) and Loggerhead (*Caretta caretta*) turtles also nest here, though in substantially lower numbers. The Sea Turtle Conservancy has been working for the conservation of these nesting populations at Tortuguero since 1959. Here, poaching of turtle eggs and meat, predation by dogs and local wildlife and light pollution are some of the key inhibitors of successful production and recruitment of hatchlings. According to the most recent published evaluations, a positive trend in Green turtle nesting activity was observed at Tortuguero from 1999-2003, possibly in response to long-term conservation efforts and policy changes. Nevertheless, nesting activity of Leatherbacks decreased from 1995-2006 and though no nesting trend has been described for Hawksbills in Tortuguero, decreases in encounters with this species were reported from 1972-1990. In order to update these trends, we examined data from weekly track surveys conducted across 18 miles of nesting beach at Tortuguero for 22 years (1995-2017). New tracks and nests deposited in the previous night were identified and counted for Green and Leatherback turtles. General Additive Models (GAMs) were used to fit a curve to track survey results for the two species separately in order to determine nest counts for each day, and a total summed estimate for the season. Nesting seasons were defined with artificial end dates for the two species, encompassing deposition of >90% of nests throughout the year. A nonparametric regression model was used to calculate 95% confidence intervals for total nest estimates, and long-term trends in nesting activity were valued using a robust GAM for each species. Preliminary analysis suggests that though a positive trend in Green turtle nesting activity was observed prior to 2004, activity has plateaued in the 13 subsequent years. Leatherback activity has continued to decline since 2006. Nesting activity of Hawksbills at Tortuguero has not previously been comprehensively evaluated due to infrequency of nesting. In earlier studies, trends have been assessed based on numbers of encounters with nesting females, however these accounts are not fully representative of nesting activity as they are limited by monitoring effort. Hawksbill nests are easily mistaken as Greens', Loggerhead nests may exaggerate hawksbill nest counts, and weekly track surveys may exclude an important proportion of nests given the temporal spread of nesting events. Tag recapture assessment of Hawksbill activity, conducted along five of the 18 miles of nesting beach, may therefore provide a more appropriate means for estimating the Hawksbill population and nesting trends at Tortuguero. This study aims to update long-term nesting activity trends for Tortuguero, Costa Rica. In standardizing the methods used to analyze these trends, changes in nesting activity may be compared across three of the species utilizing this site. Nesting trends will be crosschecked with annual abundances inferred from tag recaptures for the entire study period, allowing for an evaluation of these two nesting trend assessment methodologies. Evidence of changing and declining nesting trends calls for an examination of the success of conservation efforts on the Tortuguero nesting populations, and is pivotal to shaping perceptions of threats to marine turtles. Determining these trends may influence management approaches, particularly in terms of prioritizing and distributing protection efforts, such as beach monitoring and nest relocations, to particular species.