ID: W2787083536

TITLE: Endangered Green Turtles (Chelonia mydas) of the Northern Mariana Islands: Nesting Ecology, Poaching, and Climate Concerns

AUTHOR: ['Tammy M. Summers', 'Summer L. Martin', 'Jessy R. Hapdei', 'Joseph K. Ruak', 'Timothy Jones']

ABSTRACT:

Marine turtles in the western Pacific remain threatened by anthropogenic impacts, but the region lacks long-term biological data for assessing conservation status and trends. The Central West Pacific (CWP) population of green turtles (Chelonia mydas) was listed as Endangered by the U.S. in 2016, highlighting a need to fill existing data gaps. This study focuses on the subset of this population nesting in the Commonwealth of the Northern Mariana Islands (CNMI). Using 11 years of nesting data, we (i) estimate reproductive demographic parameters, (ii) quantify abundance and trends, and (iii) estimate the impacts of anthropogenic threats, such as poaching of nesting females and increasing sand temperatures. In 2006-2016, nesting beach surveys, identification tagging, and nest excavations were conducted on Saipan, and rapid assessments of nesting activity were conducted on Tinian and Rota. On Saipan, temperature data-loggers were deployed inside nests and evidence of poaching (adults and eggs) was recorded. This study documents year-round nesting with a peak in March?July. Nester abundance for the three islands combined was 12 ± 6 (mean ± standard deviation) females annually, with at least 63 ± 35 nests observed per year. For 39 tagged individuals, straight carapace length was 95.6 ± 4.5 cm, remigration interval was 4.6 ± 1.3 years, and somatic growth was 0.3 ± 0.2 cm yr-1. Reproductive parameter estimates included clutch frequency of 7 ± 1.3 nests per female, inter-nesting interval of 11.4 ± 0.9 days, clutch size of 93 ± 21 eggs, incubation period of 55 ± 6.4 days, hatching success of 77.9% ± 27.0, and emergence success of 69.6% ± 30.3. Mean nest temperature of 30.9 ± 1.5°C was above the pivotal threshold of 29.0°C for temperature dependent sex determination, suggesting a female-bias may already exist. Model results suggest (i) hatching success decreases and embryonic death increases when nests experience maximum temperatures beyond 34°C, and (ii) embryonic death increases in nests with mean temperatures beyond 31°C. On Saipan, 32% of nesters were poached, reducing the annual population growth rate from 11.4% to 7.4%. This study provides the first comprehensive assessment of a nesting green turtle population in the Mariana Archipelago.

SOURCE: Frontiers in marine science

PDF URL: https://www.frontiersin.org/articles/10.3389/fmars.2017.00428/pdf

CITED BY COUNT: 6

PUBLICATION YEAR: 2018

TYPE: article

CONCEPTS: ['Endangered species', 'Poaching', 'Nest (protein structural motif)', 'Threatened species', 'Fishery', 'Population', 'Ecology', 'Geography', 'Avian clutch size', 'Biology', 'Habitat', 'Reproduction', 'Wildlife', 'Demography', 'Biochemistry', 'Sociology']