

(because saturation tagging began in 1993) and also that any turtle with a PIT tag was a remigrant turtle. This assumption was made because the frequency of the remigration interval for all turtles that had nested since 2003 (ten years after PIT tagging commenced at Playa Grande) showed that only 11% of turtles had a remigration interval of greater than 5 years. Therefore, the number of years since a turtle was PIT tagged was used as a proxy for age, because if each turtle nests for the first time at approximately 9 years of age, then a turtle that has been tagged for a greater number of years will be older than a turtle that has been tagged for a lesser number of years. Remigrant turtles when analysed as a group were larger and had higher reproductive output than new recruit turtles. However, when the number of years that a turtle had been tagged was used as a proxy for age, there was no significant change in reproductive output as the number of years that a turtle had been tagged increased. These results supported neither the relative reproductive rate hypothesis nor the senescence hypothesis. Instead, nesting experience between the first nesting season and any subsequent season may be an important determinant of reproductive output rather than age. However, it is also recognised that increases or decreases (senescence) in reproductive output due to age may not be detectable in this study, because although the data were obtained over a 15 year period, it is still less than the expected reproductive life-span of a leatherback.

MULTI-YEAR EVALUATION OF HATCHLING SEX RATIOS OF HAWAIIAN GREEN SEA TURTLES

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Hawaiian green sea turtles represent an isolated population of sea turtles. They possess temperature-dependent sex determination (TSD) which can result in a variety of hatchling sex ratios. Thus, hatchling sex ratios are of conservation and ecological interest. French Frigate Shoals (FFS), part of the Hawaiian Islands National Wildlife Refuge is an atoll where approximately 90% of Hawaiian green nesting occurs. The purpose of this study was to predict hatchling sex ratios produced on East and Tern Islands at FFS based on both nest and beach temperature data from 1998-2005. Data loggers were placed into nests and in beach locations at mid-nest depth (approximately 45 cm) to monitor temperatures. Sex ratio predictions were based on the average temperature during the middle third of incubation. The nest temperature data suggested relatively cool temperatures compared to green turtle populations in other areas of the world. The sand temperatures were also relatively cool. These data suggest that either male sex ratios predominate or that the Hawaiian green turtle has evolved a lower pivotal temperature in its TSD. We have recently been addressing these hypotheses. Gonadal histology was employed to verify the sex of hatchlings that were found dead in nests after all of the live hatchlings emerged from the 2004 nesting season at FFS. The kidney and gonad tissue were preserved and processed using standard paraffin histological procedures. Each gonad was then examined using microscopy to determine if it was an ovary or a testis. Both male and female hatchlings were identified from FFS during 2004. Additionally, we are currently evaluating the pivotal temperature experimentally in laboratory incubators. The results of these studies will determine if Hawaiian green turtles have evolved a lower pivotal temperature than other populations of green turtles to coincide with cooler nesting beach temperatures.



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