INSIGHTS INTO THE NESTING ECOLOGY OF GREEN TURTLES IN THE MAIN HAWAIIAN ISLANDS DERIVED FROM GENETIC ANALYSIS

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Occasional nesting of green turtles has been observed in the main Hawaiian Islands (MHI) of Hawaii in recent years. Historically green turtle nesting occurs in the Northwestern Hawaiian Islands at French Frigate Shoals (FFS). Due to logistical constraints, monitoring the nesting activity on the main islands has been mostly confined to nest observation, and without systematic tagging information it is not clear how many females are nesting. We used mitochondrial (mt) DNA sequencing, combined with nuclear DNA analysis, of 15 microsatellite markers to infer the number of individual nesters. The genotypes of approximately 90 dead embryos and hatchlings sampled from 41 nests laid on Maui, Molokai, Kauai and Lanai between 2000 and 2009 were obtained. Our data set also included 41 hatchlings from 16 nests all laid by the same known female sampled at Lahaina between 2000 and 2006, and 85 nesting females that were sampled on FFS between 1995 and 1997. Mt DNA results showed the majority of the MHI nests were laid by females with a relatively rare haplotype only found in 16% of the FFS nesting population. Nuclear DNA results show that nesting in the MHI is experienced by a relatively small and possibly related number of females. Taken together, the mtDNA and nDNA results suggest that the increasing MHI nesting may be the result of new founders derived from the FFS breeding population. Our results show that genetic tools can be applied to provide insights for population assessments where access to nesting females is difficult.

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