IDENTIFICATION AND DESCRIPTION OF NUCLEAR DNA HAPLOTYPES OF SEA TURTLE SPECIES INVOLVED IN INTERSPECIFIC CROSSING

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Sea turtles are crucial to the ocean's health, as they have a direct impact on other species and various ecological interactions. Most species are at some level of threat according to the IUCN, aggravated by human actions that generate environmental impacts and can lead to interspecific breeding, detrimental to the species' perpetuation. The Brazilian coast has the highest known rate of sea turtle hybridization in the world. The present study aimed to identify new reference haplotypes for species involved in interspecific crosses, using nuclear (nDNA: RAG1, RAG2, and CMOS) and mitochondrial (mtDNA: control region) genetic markers. Previous studies showed the existence of 16 nuclear haplotypes undescribed in the literature (RAG1=6; RAG2=2; CMOS=8), which prevents the confirmation of hybrids. The biological material used in the study was collected from pure individuals morphologically identified as *Caretta caretta* (N=40), *Chelonia mydas* (N=41), *Lepidochelys olivacea* (N=40), and *Eretmochelys imbricata* (N=2) from three localities in Brazil - Rio de Janeiro, Espirito Santo, and Bahia. Genomic DNA fragments from samples were amplified for the three nDNA and mtDNA markers. A total of 104 pure individuals were sequenced, enabling the identification and characterization of 12 previously unreported haplotypes: 2 for RAG1, 5 for RAG2, and 5 for CMOS. One haplotype from the CMOS region not previously described was found in both a pure individual and a hybrid. Using a haplotype network, 10 additional haplotypes (RAG1=4; CMOS=6) were assigned to their respective species based on phylogenetic similarity. This study identified new nuclear DNA haplotypes and added them to the reference database for hybrid recognition. While some unpublished haplotypes still need species confirmation, the results clarify the challenges of studying interspecific crosses. The expanded database will improve the identification of hybrid sea turtles and deepen the understanding of these crosses.

THE BASKING POPULATION AND MIGRATION TRENDS OF GREEN TURTLES ON MIDWAY ATOLL NATIONAL WILDLIFE REFUGE

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Green sea turtles (*Chelonia mydas*) spend the majority of their lifespan at sea foraging before returning to land to lay eggs. This results in the bulk of field research findings being obtained through data collection on either nesting females or through in-water capture experiences. The Northwestern Hawaiian Islands (NWHI) are one of the few places in the world with a population of basking green sea turtles, also known as the Hawaiian Honu, that gives researchers the unique opportunity to gather information on male, female, & juvenile turtles during the day and on land. Midway Atoll National Wildlife Refuge (MAWNR), a two-island atoll located within the NWHI totaling approximately 2.4 square miles in land coverage, has an important stretch of beach known as Hale Honu, meaning Turtle Home. Hale Honu extends about 250m along the northeast shoreline of Sand Island and is currently proposed by USFWS for critical habitat

designation as it serves as a favored honu basking area. In this study, we summarize Midway's basking data and report on turtle migration patterns (via flipper/passive integrated transponder tag/moto-tool # recoveries), sex ratios, and seasonality. Data collection efforts consist of weekly snapshot surveys, turtle processing censuses, incidental turtle counts, & game camera photos on Hale Honu beach. Results indicate highest basking densities occur on Midway Atoll during the winter season (December-February), with the largest count being 67 baskers at once. Peak basking hours for Midway's turtle population are approximately 12pm to 4pm, which is consistent with a 9-day basking study conducted in April 2010. Since 1967, 375 turtles have been tagged at Midway, with 238 tagged since 2019. Of known sex individuals, 79% have been female. Forty-six percent of Midway turtles tagged between 2019 and 2025 were not seen again after their initial year of sighting. In addition, only 13% of the tagged population was resighted on other islands, with 98% of them being female. Understanding the basking peaks in seasonality & time of day on Midway establishes a "tagging season", a period when efforts should be amplified to increase the number of tagged turtles prior to departing Midway. Further studies including satellite tagging and increased tagging events on both Midway and other Northwestern Hawaiian Islands are necessary to determine where the Midway population, particularly males, spends time away from the atoll, and to establish better connectivity between islands. By looking at Midway's basking trends & migration patterns, researchers can then develop a better understanding of the ecology, demography, and conservation needs of the threatened Hawaiian Honu.

EFFICACY OF SMALL MONEL FLIPPER TAGS IN A COASTAL GREEN TURTLE AGGREGATION

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Tagging of sea turtles and subsequent recapture of marked individuals allows researchers to better understand many aspects of population biology and dynamics, including site fidelity, distribution and migration patterns, reproductive output, growth rates, and changes in health. Externally-applied flipper tags have long been an important tool for large-scale marking of sea turtles because they are readily visible and relatively inexpensive compared to more permanent, intramuscular tagging using passive integrated transponder (PIT) tags. The earliest sea turtle tagging programs used copper, plastic, and Monel alloy tags adapted from livestock applications, and many programs now use either Inconel alloy or titanium self-piercing tags specifically designed for sea turtles. Current "standard tags" such as the Inconel 681IC style widely used in the United States are too large for use on dispersal stage and small coastal juvenile sea turtles (<30 cm straight carapace length, SCL), but smaller tags have been developed and permitted for use in recent years. During 2022-2025, the University of Central Florida Marine Turtle Research Group tagged 151 immature green turtles (*Chelonia mydas*; SCL: 28.2 +/- 2.5 cm SD) at Trident Basin, Port Canaveral, Florida, USA with style 1005-4 Monel tags on one or both front flippers, as well as PIT tagging each turtle. Our program subsequently recaptured 29 of the Monel-tagged green turtles, and two others were documented by other groups as live strandings, for a total of 31 recaptured individuals. In total, we recorded 43 recapture events (22 individuals recaptured once, 7 recaptured twice, 1 recaptured three times, and 1 recaptured four times) 47-762 days after Monel-tagging (mean: 297 +/- 159 SD). We observed that the small Monel tags were susceptible to biofouling and corrosion, becoming unreadable and/or brittle after as little as 1.5 to 6 months. We did not document any tag condition issues on Inconel-tagged green turtles recaptured during the same sampling sessions, and occasional biofouling was easily removed without damage to Inconel tags or impacting their readability. Based on our observations of recaptured green turtles at Trident Basin, we do not consider 1005-4 Monel tags to be a good option for marking these turtles because the tags can corrode quickly and can become pitted and unreadable after a short time in a marine

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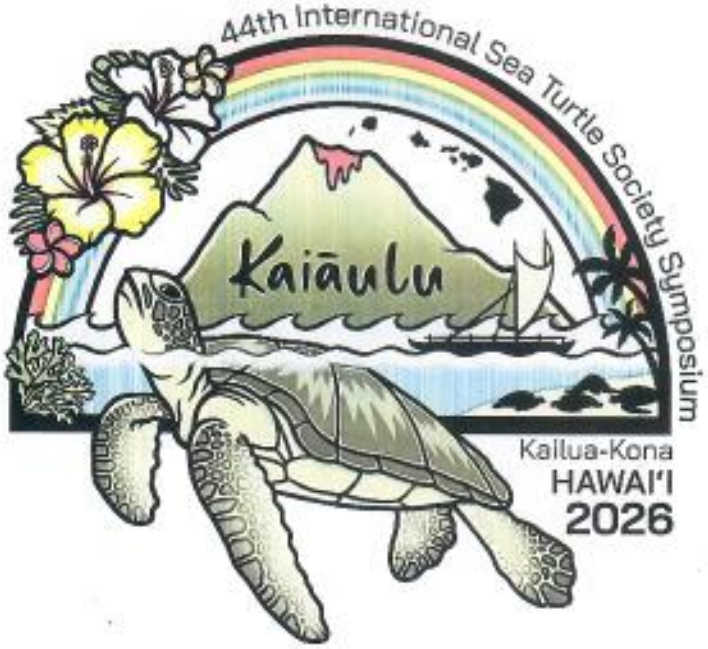

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