sufficient to estimate the relative contributions of contributing rookeries. Patterns of origin and diversity along the South African coast differed among species. Most stranded or bycaught loggerheads and leatherbacks originated from South African rookeries, which exhibited notably low haplotype diversity relative to other global populations. However, we also found evidence of long-distance migrants: one loggerhead stranded in Cape Town was assigned to the Oman population, another to Western Australia, and one leatherback likely originated from eastern India—representing the first evidence of connectivity with these regions. Non-nesting green turtles predominantly belonged to the Southern Mozambique Channel (Juan de Nova and Europa) clade, although one individual originated from East Atlantic rookeries. Non-nesting hawksbills appeared to originate mainly from the Seychelles and Chagos Archipelagos. While sample sizes for leatherbacks and hawksbills were small, and stranded or bycaught individuals may not fully represent populations, these findings provide important first insights into population connectivity in South African waters. Overall, the results demonstrate that South African waters support both resident and transient turtles from multiple RMUs, reveal long-distance migration between recognized RMUs, and function as developmental foraging grounds for regional green turtle and hawksbill populations.

TURNING THE TIDE... BACK? GLOBAL SEA TURTLE POPULATION TRENDS AFTER DECADES OF CONSERVATION*

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Sea turtles are widely recognised as conservation-dependent species because of their slow growth, late maturity, wide-ranging migrations, use of multiple habitats and extensive anthropogenic threats they face across all ocean basins, necessitating long-term protection to maintain population viability. After decades of substantial conservation investment, particularly at nesting beaches and foraging habitats, it is critical to ask the question whether these efforts have translated into enduring population recovery? Multiple global databases have been developed to evaluate population status and trends, most notably the Living Planet Index (LPI) and the IUCN Red List, as well as a few recent publications comparing global trends. The IUCN Marine Turtle Specialist Group (MTSG) also coordinated several "Burning Issues" processes, including the recent Conservation Priorities Portfolio re-evaluation, which combined empirical data and expert judgment to answer this key question. Building on the LPI framework, we combed through literature and reports and collated 4,606 nesting records (1956–2022) for all 7 sea turtle species, representing 304 rookeries across 43 Regional Management Units (RMUs) globally. To standardise diverse data types, all trends were expressed as nesting females per rookery, using consistent nest-to-female conversion factors. Instead of relying on smoothed curves, we applied a modelling approach using the Multivariate Autoregressive State–Space (MARSS) framework to estimate RMU-level and their aggregated species-level trajectories. Each RMU's abundance was modelled as a random walk in logarithmic space over time, incorporating both process and observation error. Resulting RMU trends were then clustered using the R package cluster to identify groups exhibiting similar temporal patterns, and the average rate of change was compared over all years and recent trajectories (since 2010) separately to detect emerging shifts. Three main insights emerged. First, sea turtles benefit from a portfolio effect, where the diversity of populations and rookeries within a species stabilises overall abundance for the RMU or species. Second, four species showed increasing global trends, two were stable, and one was in decline. Third, and perhaps most concerning, while long-term data reflect widespread recovery since the 1980s, recent patterns reveal signs of stabilisation or renewed decline, particularly within one of the four major ocean basins (Pacific, Atlantic,

Mediterranean, and Indian) despite conservation. Collectively, these results suggest that while global conservation measures have yielded tangible gains, the momentum of recovery may be slowing. The reason for this plateauing is uncertain, and it may signal that populations have reached carrying capacity somewhere in their life history per habitat, or that threats have shifted either in distribution or cause. The evidence points to a need for renewed vigilance and regionally tailored strategies to prevent a reversal of progress. In essence, the tide that once seemed to turn in favour of sea turtles may now be turning back, signalling a critical juncture for their continued recovery.

GENETIC DIVERSITY, DEMOGRAPHIC HISTORY, AND FORAGING ECOLOGY IN TWO CONTRASTING LEATHERBACK POPULATIONS*

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Leatherbacks (*Dermochelys coriacea*) are unique amongst other sea turtle species, they are genetically distinct as the only extant individual in Dermochelyidae, and use a wide range of marine environments, mostly foraging in pelagic waters. Globally, leatherback populations vary in both population size and migration. In the Northwest Atlantic (NWA), the Florida subpopulation has increased in recent decades and typically migrates northward after nesting. Comparatively, the Southwest Indian Ocean (SWIO) population has remained stable over the past 50 years, with individuals showing more variable movements going north and south after nesting. What is unclear is whether the difference in abundance is from human pressure or natural variation in the environment, and how foraging ecology might play a role. To address these differences in contrasting leatherback populations we investigated current genetic diversity, past population trends, and foraging behavior. Restriction-site associated DNA sequencing of over 10,000 single nucleotide polymorphisms was used to estimate levels of nucleotide diversity and effective population size across recent (~100 generations) and historical (>1,000 generations) timescales. Genetic diversity in the SWIO was lower than in Florida leatherbacks. The Florida population (~ 250 individuals) was larger than the SWIO (~ 140 individuals), with effective population size remaining stable over the last 60 years. Stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope analyses indicated distinct clustering, possibly representing specific foraging area use across oceanic regions for both Florida and SWIO populations. Decadal trends in isotope values showed cyclical changes, likely reflecting baseline isotopic variation, with a stronger temporal signal in Florida than the SWIO. The isotopic niche for leatherbacks in Florida was slightly smaller, possibly indicating a more limited geographic range in foraging areas. The lower population size in the SWIO is likely a result of historical factors like a small founder event, limited connectivity, and small population size over time rather than differences in foraging ecology. Genomic and stable isotope data are complementary tools that can be used for understanding conservation outcomes in sea turtles.

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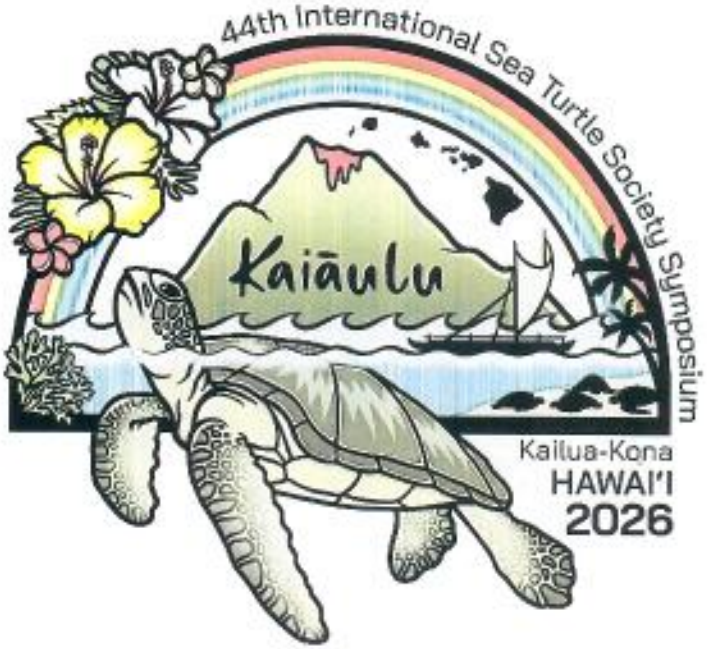

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