

VARIATION IN REMIGRATION INTERVAL IS LINKED TO FORAGING DESTINATION OF WESTERN PACIFIC LEATHERBACK TURTLES

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Timing of reproduction and productivity of migratory species reflect ecological conditions of their foraging regions. Non-breeding habitat quality has been linked to arrival time to breeding areas, reproductive performance and breeding population abundance. Leatherback turtles (*Dermochelys coriacea*) obtain resources for reproduction from distant foraging regions, and they do not typically breed every year. The number of years separating successive nesting seasons or remigration interval includes the amount of time to complete migration and to accumulate enough reserve for reproduction in the foraging region. In this study, we compared remigration intervals of leatherback turtles that foraged in distinct regions of the Pacific. The largest remaining nesting aggregation of western Pacific leatherback turtles is in the Bird's Head peninsula on the northwest coast of Papua, Indonesia. Turtles that nest during April to September migrate to temperate (Northeast Pacific and North Pacific Transition Zone) and tropical (South China Sea) foraging regions, which vary in the distance from nesting beach, latitude, biogeochemical process, and productivity. To infer foraging regions of nesting turtles, we used stable nitrogen and carbon ratios ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$) of satellite-tracked turtles as predictors of foraging region in a linear discriminant analysis. The resulting functions were then used to classify turtles sampled in 2010 and 2011. Remigration intervals of assigned turtles were calculated from historic tagging data, and compared among the three groups using analysis of variance. As predicted, turtles that foraged in the Northeast Pacific had greater $\delta^{15}\text{N}$. Turtles that foraged in the North Pacific Transition Zone were distinguished from those that foraged in the South China Sea by their lesser (more negative) $\delta^{13}\text{C}$. Means of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ were 15.04‰ (95% CI from 14.04 to 16.04‰) and -17.14‰ (-17.66 to -16.63‰) for turtles that foraged in the Northeast Pacific, 12.69‰ (11.42 to 13.97‰) and -18.21‰ (-18.86 to -17.56‰) for turtles that foraged in the North Pacific Transition Zone, and 11.03‰ (9.89 to 12.17‰) and -16.82‰ (-17.41 to -16.24‰) for turtles that foraged in the South China Sea. The discriminant functions correctly classified 74.2% of satellite-tracked turtles. Turtles that foraged in the Northeast Pacific had a longer remigration interval (>3 years) than turtles that foraged in the North Pacific Transition Zone and South China Sea (2 and 3 years). Variable remigration intervals may explain fluctuations in the number of turtles nesting annually and has implications for estimating population size. We thank the International Sea Turtle Society, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service, Ecoteach, Defenders of Wildlife, Sea Turtle Conservancy, Defenders of Wildlife, Lotek, Sirtrack, Telonics, and CLS America for providing a generous travel grant award. Funding and logistical support for this study were provided by the Bird's Head Leatherback Program of State University of Papua, U.S. National Oceanic and Atmospheric Administration – National Marine Fisheries Service, Dr. Earl H. Myers and Ethel M. Myers Oceanographic and Marine Biology Trust, PADI Foundation, and Friend's of Moss Landing Marine Laboratories' Signe Memorial Scholarship.



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Compiled by:

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