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# PROCEEDINGS OF THE THIRTY-FOURTH ANNUAL SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION



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**LONG TERM MONITORING OF LOGGERHEAD TURTLES ON FETHIYE BEACH, TURKEY:  
POPULATION STILL DECLINE IN DECLINE**

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Decline and loss of sea turtle populations are increasingly becoming an international concern. In this respect conservation efforts are carried out at most of the nesting beaches in the world. Breeding and nesting activities of sea turtles on Fethiye Beach, Turkey take place in Fethiye-Göcek Special Environmental Protection Area. Previous studies showed a negative population trend of the loggerhead turtle population at Fethiye beach, Turkey based on nesting data. We analyzed nesting trends over 21 consecutive years, from 1993 to 2013. A total 2,090 nests were recorded during 21 consecutive years with a mean of 99.52 nests per year. There were also strong annual fluctuations in the number of nests, which ranged from a minimum of 58 nests (in 1994) to a maximum of 158 (in 2004). In 2013, we recorded a total of 258 emergences, of which 104 (40.31%) was resulted in nests. Linear regression analyses showed that there is a statistically significant negative relationship between years and nest numbers at the 99% confidence level ( $r^2=0.30$ ;  $p<0.01$ ). This result leads to the interpretation that the number of nesting turtles is still in decline at Fethiye beach. The main reasons of the decrease can be excessive use of the beach by the people, lights from the backside of the beach, and boat traffic on the shore. Such a potential negative trend at a key Turkish nesting beach indicates a need for more sharp effective conservation programs. The other reason for population decline on these beaches could be in-water mortalities of sea turtles either from fishing activities and/or water sports.

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**FEMALE-EGG STABLE ISOTOPE DISCRIMINATION FACTORS IN LOGGERHEAD SEA TURTLES**

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The carbon and nitrogen stable isotope values ( $\delta^{13}C$  and  $\delta^{15}N$  values) of animals are assimilated through the diet and reflect the animal's trophic position and foraging location. Because encountering and sampling all sea turtles at a nesting beach can be difficult, we wanted to determine if egg samples provide a good proxy of female isotope values. The main goal of this study was to determine if there is a reliable offset (discrimination factor) between  $\delta^{13}C$  and  $\delta^{15}N$  values of loggerhead sea turtles and their eggs (both yolk and albumen). Additionally, the effects of ethanol preservation and lipid extraction on the  $\delta^{13}C$  and  $\delta^{15}N$  values of loggerhead yolk were evaluated to calculate reliable female-egg discrimination factors. Epidermis, albumen, and yolk samples were collected from nesting loggerheads during the 2011 nesting season at Wassaw Island, Georgia, USA and preserved in 70% ethanol or frozen. All egg and epidermis samples ( $n = 269$ ) were processed and analyzed for  $\delta^{13}C$  and  $\delta^{15}N$  values. Subsamples of the yolks were lipid extracted. We used paired t-tests to compare the  $\delta^{15}N$  and  $\delta^{13}C$  between the yolks under a combination of different treatments (frozen vs. ethanol preservation and untreated vs. lipid extracted). We found a highly significant correlation between female epidermis  $\delta^{15}N$  and  $\delta^{13}C$  values and their yolk or albumen isotopic values, which permits the approximation of female epidermis stable isotope values from egg components. Also, we found that lipid extraction significantly affected yolk  $\delta^{13}C$  and  $\delta^{15}N$  values, while ethanol preservation significantly affected  $\delta^{13}C$  values. The changes in isotopic values for both treatments can be accounted for using equations derived from linear regressions