

and detection probability:  $p$ ) but they can also be used to derive estimates of residence time (number of clutches per female) and  $N$  (number of nesting females) during each of the two seasons in question. Detection probabilities ( $p$ ) for both seasons were low (~15-20%), leading to uncertainty as to whether such analysis would produce viable results. Program Release was run through program MARK for both years and indicated good fit of the models to the data. The model-averaged estimate of population size ( $N$ ) for the 2010 season is 2,167 (95% CI: 1,558-2,775) and it is 2,515 for the 2011 season (95% CI: 935-4,097). Model-averaged residence time (number of nesting attempts per female) is 5.53 for the 2010 (95% CI: 5.2-5.9) data and 3.69 for 2011 (95% CI: 1.85-5.54). Analysis of the 2012 data is forthcoming and will be included in the presentation. Results of these analyses show that important variation in number of clutches per female exists between years at the Archie Carr National Wildlife Refuge. Acknowledgments: I would like to thank all of the sponsors of the travel grant (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) and the International Sea Turtle Society for their support in providing my lodging while in Baltimore making it possible for me to attend the meeting.

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**VARIATIONS IN THE OPERATIONAL SEX RATIO FOR BREEDING LEATHERBACK TURTLES (*DERMOCHELYS CORIACEA*) OVER THREE NESTING SEASONS AT ST. CROIX, USVI.**

**Kelly R. Stewart and Peter H. Dutton**

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For marine turtles, the adult breeding sex ratio, or the operational sex ratio (OSR) is important to know for population modeling purposes as well as for monitoring the status of a population. Previously we demonstrated that for leatherback turtles in St. Croix (USVI), there were as many males as females in a given year that were actively breeding. In 2010, we found that for 46 females (a subset of the nesting females that year), there were 47 males that had been actively breeding with those turtles. We expanded this study to look at OSR over multiple years to A) determine if operational sex ratios changed from year to year, B) to identify males that may have been breeding yearly and C) to complete a male census for this nesting population. Since we had already evaluated male turtles for the 2010 nesting season, we looked at the OSR for 2009 and 2011 at St. Croix. To do so, we genetically fingerprinted nesting females and their hatchlings using 7 polymorphic microsatellite markers. Then with GERUD1.0, we were able to identify fathers for each of the hatchlings and infer male genetic fingerprints. In 2009, we evaluated 1051 hatchlings from 99 females and in 2011 we fingerprinted 755 hatchlings belonging to 65 females. Over the 3 years of the study we found that the male to female ratio remained fairly stable at nearly 1:1 and changed only marginally over the time frame. We found that a few males that had mated in all 3 years, some that mated in 2 years and more commonly, we found that most males had mated in just one year. It should be noted that just because a male was not identified in the genotypes of the hatchlings, it should not be inferred that the male was not at the nesting grounds attempting to mate. We have now identified 190 individual males at this nesting rookery, thus providing a census of the breeding males in this population. It is now possible to monitor the breeding activity of male turtles at any nesting ground and this work shows the potential for evaluating male reproductive success or fitness, as well as quantifying the annual nesting population of males and females.



NOAA Technical Memorandum NMFS-SEFSC-645

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



## **2013 INTERNATIONAL SEA TURTLE SYMPOSIUM**

Baltimore, Maryland USA

5 to 8 February, 2013  
Baltimore, Maryland, USA

Compiled by:

Tony Tucker, Lisa Belskis, Aliko Panagopoulou, Alan Rees, Mike Frick,  
Kris Williams, Robin LeRoux, and Kelly Stewart

U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
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75 Virginia Beach Drive  
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