

West Atlantic Green Turtle Population Modeling Workshop

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The West Atlantic Green Turtle Population Modeling Workshop was held from 22-24 October 2003 on Grand Cayman, British West Indies. The workshop was funded through the Cayman Turtle Farm and organized by Alan Bolten, Milani Chaloupka and Ken Hydes.

The objective of the workshop was to launch the West Atlantic Green Turtle Modeling Initiative to foster better insight into the population dynamics of the regional green turtle metapopulation. Milani Chaloupka presented a stochastic simulation model of green turtle dynamics in the West Atlantic that he had developed for the workshop. The model was based on demographic information derived for this stock from published material and grey literature. The simulation model was designed to support robust evaluation of the effects of habitat-specific competing mortality risks on stock and substock-specific viability. This is a substock-, sex- and ageclass-structured model linked by density-dependent, correlated and time-varying demographic processes that are subject to environmental and demographic stochasticity. Compensatory density-dependent processes have been included in the model to account for the temporal variability in the substock-specific proportion of females and males preparing to breed each year in response to major oceanographic anomalies such as El Niño events that are well known to affect green turtle stocks. Density-dependent processes (Allee effects) were also included by using a female mating success probability function that was dependent on the probability of finding at least one male mate. Environmental stochasticity was accounted for by sampling all the demographic rates from probability density or mass functions to reflect the temporal variability observed for this stock. Demographic stochasticity was accounted for in the model by using Poisson discrete event sampling approach to account for extra-Poisson sampling variation observed in fecundity or survival probabilities for other green turtle stocks.

Workshop participants reviewed the model and identified research needed to improve the parameters in the model. Unpublished sources of data were identified, and collaborative data analyses were planned. As will be announced in more detail later, a collaborative initiative to compile tag return data for the region was planned to define the spatial structure of the West Atlantic green turtle metapopulation.

Participants in the workshop were: Alberto Abreu, George Balazs, Catherine Bell, Karen Bjorndal, Janice Blumenthal, Alan Bolten, Milani Chaloupka, Gina Ebanks-Petrie, Scott Eckert, Vin Fleming, Jack Frazier, Brendan Godley, Julia Horrocks, Ken Hydes, Cynthia Lagueur, Brian Lusty, Neca Marcovaldi, Anne Meylan, Felix Moncada, Nicholas Mrosovsky, Joe Parsons, Henri Reichart, Sebastian Troeng, Vincent Vera, and Melania Yanez.

A listserv discussion group has been established to foster communication within the group. A follow-up workshop is planned for 2005.