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ECOPATH WITH ECOSIM (EWE) AND THE ECOLOGICAL ROLE OF *CHELONIA MYDAS* IN THE CARIBBEAN

Colette Wabnitz[1], Karen Bjorndal[2], Alan Bolten[2], and Daniel Pauly[1]

[1] Fisheries Centre, University of British Columbia, Vancouver, British Columbia, Canada
[2] Archie Carr Center for Sea Turtle Research, University of Florida, Gainesville, Florida, USA

The past roles of sea turtles as major consumers in many marine ecosystems have only recently been recognized. Green turtle biomass levels required to maintain "healthy" seagrass beds within the Caribbean, as well as potential changes in community structure under various densities of *Chelonia mydas*, are explored using a quantitative ecosystem model, Ecopath with Ecosim (EwE). The Ecopath model was designed as a "snapshot" estimation of turtle density for the Bahamas, and then extrapolated to the Caribbean. Thus, the Ecopath result is an estimate of turtle biomass per km^2 of seagrass, given a number of trophic considerations. These biomass estimates were then evaluated over a range of conditions (e.g. competitive interactions) to determine turtle biomass levels needed to maintain a productive system. The Ecosim module allowed predicting changes in community structure under varying levels of turtle impact given fine-tuning of trophic mediations built into the system. Important assumptions underlying the exploration of such interactions are that: i) shoot density is independent of blade length, thus an increase in seagrass biomass can be equated with longer blade length; and ii) an increase in biomass is coupled with a decrease in productivity:biomass ratios, which has been validated by simulated grazing experiments in the Bahamas. These explorations combined with apparent changes in community structure are used to characterize target levels of green turtle biomass needed to maintain seagrass ecosystems in a productive state - and how that biomass compares to the potential carrying capacity of green turtles for the Caribbean.

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COMPILERS:
Mike Frick, Aliki Panagopoulou, Alan F. Rees, Kris Williams

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