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**John G. Alford\*** (jalford@shsu.edu), Lee Drain Building, P.O. Box 2206, Huntsville, TX 77341, and **William I. Lutterschmidt**. *Modeling Energetic and Theoretical Costs of Thermoregulatory Strategy*.

Poikilothermic ectotherms are those animals whose body temperatures fluctuate with ambient environmental temperatures. Some ectotherms have evolved behaviors to maintain or thermoregulate their body temperature around a preferred or "set point" temperature. Thermoregulatory behaviors may range from body positioning to optimize heat gain to shuttling among preferred microhabitats. We have modeled movement and shuttling behavior within a habitat as a biased random walk. We quantify the required movements and potential energetic cost for a timber rattlesnake to actively thermoregulate rather than thermoconform using a model parameter that forces the snake to precisely maintain its preferred body temperature. In addition, we investigate the behavioral life histories of sit-and-wait versus active foraging behaviors and their associated thermoregulatory strategies by quantifying the benefits and the metabolic and locomotory costs of thermoconforming versus actively thermoregulating. (Received September 08, 2010)