1014-92-521   **James L. Hayward*** (`hayward@andrews.edu`), Biology Department, Andrews University, Berrien Springs, MI 49104-0410, and **Shandelle M. Henson** (`henson@andrews.edu`), Department of Mathematics, Andrews University, Berrien Springs, MI 49104-0410. *Predicting the Behavior of Seabirds Using Compartmental Models.*

Animal behavior arises from a complicated interaction of demographic and environmental factors. The influence of environmental factors on some behaviors can be sufficiently deterministic to allow for mathematical prediction at the aggregate level. We propose a general differential equation compartmental model for predicting multiple behaviors in multiple habitats. We use this methodology to explain and predict the dynamics of habitat occupancy and sleep in a seabird colony. (Received September 19, 2005)