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**Christine Sample\***, Emmanuel College, 400 Fenway, Boston, MA 02215, and **Joanna Bieri, Benjamin Allen, Yulia Dementieva, Alyssa Carson, Shirley Qiu, Connor Higgins** and **Sadie Piatt**. *A model for quantifying the importance of habitats in a migratory network*. Preliminary report.

Understanding the influence of discrete habitats on the survival of a migratory species is an essential part of making successful conservation and management decisions. Migration is a complicated process, and mathematical models of migratory networks offer a way to understand the importance of different parts of an organism's annual cycle. Representing the system as a graph in which habitats are nodes and migratory paths are edges, the reproduction, survival, and movement of the population are modeled with time- and density-dependent functions. Under this network framework, we assess the importance of each node by calculating two values, the C-metric and K-metric. We generalize an existing C-metric, which estimates the per capita contribution of cohorts using a given node, to account for multiple seasons and classes. We develop the K-metric to estimate the overall growth rate when every individual must pass through a given node. We demonstrate how the proposed metrics can be used to analyze a variety of populations including the monarch butterfly, northern pintail, Yellowstone elk, and a plant species. (Received September 26, 2017)