1147-92-529 **Kyle Dahlin*** (kdahlin@purdue.edu) and **Zhilan Feng**. *Modelling the population impacts of avian malaria on Hawaiian honeycreepers: bifurcation analysis and implications for conservation.* Preliminary report.

Avian malaria is a mosquito-borne parasitic disease of birds that has been identified as a cause of the decline of Hawaiian forest birds, in particular the endemic Hawaiian honeycreepers. We formulate a compartmental model of the transmission dynamics of avian malaria between honeycreepers and mosquitoes as a system of ordinary differential equations. We derive the basic reproduction number as well as criteria for existence and stability of disease-free and enzootic equilibria. Through a global sensitivity analysis, we determine that the model dynamics are most sensitive to the avian malaria mortality probability. We consider the population impacts of certain management strategies, in particular, larval mosquito source reduction and captive propagation. We show that the elimination of enzootic avian malaria is likely impossible through the application of these management strategies alone. However, the long-term densities of some honeycreeper populations may be returned to healthy levels through application of these strategies at appropriate intensities. Further work will determine the population impacts of management scenarios that incorporate modern forms of vector control such as sterile-insect techniques or Wolbachia-based methods. (Received January 25, 2019)