

Miller, J.R. B. 2007. *Population densities of Poison Dart Frogs in a Regenerating Forest as Measured by the Hayne Estimator*. Undergraduate Thesis, Claremont McKenna College. 70p.

#### ABSTRACT

With amphibian populations declining throughout the world, there is an increasing demand for effective tools to measure species responses to environmental change. This study investigates the effectiveness of the Hayne Estimator in evaluating the densities of two species of poison dart frogs in three Costa Rican lowland forest habitats with varying degrees of recovery from deforestation (selectively-logged riparian forest, post-pasture secondary forest and non-native bamboo plantation forest). Population densities of *Dendrobates granuliferus* and *Dendrobates auratus* were significantly highest in riparian forest, substantially lower in bamboo, and very low in secondary forest. This trend corresponds to previous research on species recolonization after deforestation and subsequent regrowth and indicates that the Hayne Estimator is well suited for the evaluation of poison dart frogs. Abiotic factors such as proximity to water, rainfall, temperature and time of day were found to have some effect on frog sighting frequency. Individuals of both species tended to aggregate near water, but the proportional distribution of transects according to all habitat water presence likely negated this effect. Rainfall was unrelated to the sighting frequency of *D. auratus* but correlated with the sighting frequency of *D. granuliferus*. Air temperature did not impact sighting frequency. Time of day, however, was found to influence the sighting frequencies of both species, with peaks occurring in the early morning and late afternoon. The robustness of the Hayne Estimator when used to monitor poison dart frogs suggests that the technique may be a valuable tool for future conservation research.