Ecology: Data Paper

Demography of the understory herb *Heliconia acuminata* (Heliconiaceae) in an experimentally fragmented tropical landscape

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Author Note

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Abstract

Habitat fragmentation remains a major focus of research by ecologists decades after being identified as a threat to the integrity of ecosystems. A large body of empirical research has documented the local extinction of plant species from fragments; although the demographic mechanisms underlying these extinctions are rarely known, they are often hypothesized to result from reduced rates of individual growth and survivorship in fragments. This is thought to be especially true in lowland tropical forest, where abiotic conditions in fragments are often dramatically different from those in primary forest. Tests of this hypothesis have been limited by the paucity of long-term demographic data collected in both forest fragments and continuous forest sites.

Here we report 12 years (1997-2009) of annual censuses of 13 populations of the Amazonian understory herb *Heliconia acuminata* (LC Rich.). These surveys were conducted in 13 plots established in the experimentally fragmented landscape of the Biological Dynamics of Forest Fragments Project, located north of Manaus, Brazil. Each plot is 50×100m; four plots are in 1-ha fragments, three plots are in 10-ha fragments, and six plots are in continuous forest. The population in each plot was censused annually, at which time we recorded, identified, marked, and measured new seedlings, identified any previously marked plants that died, and recorded the size of suriving individuals. Plots were also surveyed during the flowering season to identify reproductive plants and record the number of inflorescences each produced. The dataset comprises >67,000 plant×year records of >8500 plants, including >3400 seedlings established after the first census. These data have been used to investigate topics ranging from how fragmentation-related reductions in germination influence population dynamics to tests of statistical methods for analyzing reproductive rates.

Keywords: Amazon, Brazil, deforestation, demography, edge effects, forest fragments, habitat fragmentation, integral projection models, matrix models, population dynamics, vital rates