

Ecology: Data Paper

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

Emilio M. Bruna^{1,2,3}, Maria Uriarte⁴, Maria Rosa Darrigo³, Paulo Rubim³, Cristiane F. Jurinitz³, Eric R. Scott¹, Osmaildo Ferreira da Silva³, & W. John Kress⁵

¹ Department of Wildlife Ecology and Conservation, University of Florida, PO Box 110430, Gainesville, FL 32611-0430, USA

² Center for Latin American Studies, University of Florida, PO Box 115530, Gainesville, FL 32611-5530, USA

³ Biological Dynamics of Forest Fragments Project, INPA-PDBFF, CP 478, Manaus, AM 69011-970, Brazil

⁴ Department of Ecology, Evolution and Environmental Biology, Columbia University, 1200 Amsterdam Ave., New York, New York 10027, USA

⁵ Department of Botany, National Museum of Natural History, PO Box 37012, Smithsonian Institution, PO Box 37012, Washington DC, USA

Corresponding author: Emilio M. Bruna (embruna@ufl.edu)

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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 plots established in the experimentally fragmented landscape of the Biological Dynamics of Forest Fragments Project, located north of Manaus, Brazil. The plots, each $50 \times 100\text{m}$, are located in forest fragments of different sizes ($N = 4$ plots in 1-ha fragments and $N = 3$ plots in 10-ha fragments) as well as continuous forest ($N = 6$ plots). 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 had died, and recorded the size of individuals that survived. During the flowering season we conducted regular surveys to recorded the identity of flowering plants and the number of inflorescences each produced. The resulting dataset comprises $> 67,000$ plant \times year records of >8500 plants, including >3400 seedlings that became established after the initial census. These data have been used in publications on 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, flowering, forest

59 fragments, habitat fragmentation, integral projection models, matrix models, population
60 dynamics, vital rates