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DATA PAPER

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

Emilio M. Bruna[1,2,3] | **María Uriarte**[4] | **Maria Rosa Darrigo**[3] | **Paulo Rubim**[3] | **Cristiane F. Jurinitz**[3] | **Eric R. Scott**[1] | **Osmaildo Ferreira da Silva**[3] | **W. John Kress**[5]

[1]Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida, USA

[2]Center for Latin American Studies, University of Florida, Gainesville, Florida, USA

[3]Biological Dynamics of Forest Fragments Project, INPA-PDBFF, Manaus, Brazil

[4]Department of Ecology, Evolution and Environmental Biology, Columbia University, New York, New York, USA

[5]Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington DC, USA

Correspondence
Emilio M. Bruna
Email: embruna@ufl.edu

Present address
Eric R. Scott, College of Agriculture and Life Sciences, University of Arizona, Tucson, Arizona, USA.

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Abstract

Habitat fragmentation remains a major focus of research by ecologists decades after being put forward as a threat to the integrity of ecosystems. While studies have documented myriad biotic changes in fragmented landscapes, including the local extinction of species from fragments, the demographic mechanisms underlying these extinctions are rarely known. However, many of them—especially in lowland tropical forests—are thought to be driven by one of two mechanisms: (1) reduced recruitment in fragments resulting from changes in the diversity or abundance of pollinators and seed dispersers or (2) increased rates of individual mortality in fragments due to dramatically altered abiotic conditions, especially near fragment edges. Unfortunately, there have been few tests of these potential mechanisms due to the paucity of long-term and comprehensive demographic data collected in both forest fragments and continuous forest sites. Here we report 11 years (1998–2009) of demographic data from populations of the Amazonian understory herb *Heliconia acuminata* (LC Rich.) found at Brazil's Biological Dynamics of Forest Fragments Project (BDFFP). The data set comprises >66,000 plant × year records of 8586 plants, including 3464 seedlings established after the first census. Seven populations were in experimentally isolated fragments (one in each of four 1-ha fragments and one in each of three 10-ha fragments), with the remaining six populations in continuous forest. Each population was in a 50 × 100 m permanent plot, with the distance between plots ranging from 500 m to 60 km. The plants in each plot were 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 surviving individuals. Each plot was also surveyed four to five times during the flowering season to identify reproductive plants and record the number of inflorescences each produced. These data have been used to investigate topics ranging from the way fragmentation-related reductions in germination influence population dynamics to statistical methods for analyzing reproductive rates. This breadth of prior use reflects the value of

these data to future researchers. In addition to analyses of plant responses to habitat fragmentation, these data can be used to address fundamental questions in plant demography and the evolutionary ecology of tropical plants and to develop and test demographic models and tools. Though we welcome opportunities to collaborate with interested users, there are no restrictions on the use of this data set. However, we do request that those using the data for teaching or research purposes inform us of how they are doing so and cite this paper and the data archive when appropriate. Any publication using the data must also include a BDFFP Technical Series Number in the Acknowledgments. Authors can request this series number upon the acceptance of their article by contacting the BDFFP's Scientific Coordinator or E. M. Bruna.

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

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The complete data set is available as Supporting Information and in Dryad at https://doi.org/10.5061/dryad.stqjq2c8d. The version of the code used to review, correct, and prepare this archive (version 1.0.0) is available at Zenodo at https://doi.org/10.5281/zenodo.8284379. The code used to prepare this publication, including statistical summaries reported in the text, tables, and figures, is available at Zenodo at https://doi.org/10.5281/zenodo.8284430.

ORCID

Emilio M. Bruna https://orcid.org/0000-0003-3381-8477

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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