DATA PAPER

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

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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.stqij2c8d](https://doi.org/10.5061/dryad.stqij2c8d). 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](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](https://doi.org/10.5281/zenodo.8284430).

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**SUPPORTING INFORMATION**
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