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Organization: University of Florida

Review #1

Proposal Number: 1754741
NSF Program: POP & COMMUNITY ECOL PROG
Principal Investigator: Bruna, Emilio M
Proposal Title: SG: Are there synergistic effects of habitat fragmentation and drought on tropical plant demography?
Rating: Very Good

REVIEW:

In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.

For years, issues of land use and habitat fragmentation were at the center of conservation-oriented studies of population and community dynamics. With the advent of climate change, however, focus switched to climate effects while those of land-use may still be strong in many systems. The PIs propose to study the interactive and even synergistic population-level effects of these two dimensions of anthropogenic global change, which is greatly needed. The chosen understory herb is ideal for studying the proposed questions (little immigration and emigration, perfect detection, etc.). Moreover, the backdrop of long-term demographic monitoring in an experimentally fragmented forest system is also ideal.

In addition to the strengths of the data and study system, the team proposes rigorous analytical approaches to addressing the study questions and they have the skills to do so. The recruited post-doc will receive excellent training. The existing experience and infrastructures will greatly facilitate success of the proposed study.

Lacking from the proposal are ways to deal with potential density- and frequency-dependent effects on demography and how these might vary among 1 ha patches, 10 ha patches, and contiguous forest (e.g., the relative density of mature flowering plants in a local population and how this might interact with attraction of pollinators and seed dispersers). I thought this was the primary deficiency in scientific merit of the otherwise strong proposal.

In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to broader impacts.

The Broader Impacts were nothing out of the ordinary, and I felt some opportunities were missed here. Are local youth or aspiring scientists from Brazil given opportunities to learn about the study system or even gain important field experience? Moreover, I thought a huge opportunity was missed to explain the important benefits of how the study results might be used to guide land-use management and conservation strategies to better ensure sustainable populations amidst climate change (i.e., how might land-use be managed to offset or buffer detrimental effects of drought). It seems the study could have direct, tangible benefits for the focal and similar species, as well as benefits for guiding future studies on other taxa.

Please evaluate the strengths and

weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if applicable

Summary Statement

Despite a smattering of typos in the proposal, I thought it was generally well written and the questions well posed. The study will provide an important and robust test of the interactive and synergistic effects of drought and habitat fragmentation on plant demography, population dynamics, and population viability. However, I would have liked the introductory parts of the proposal to be more general. There are needs to study interactive effects of climate change and land use across many taxa, and the proposal focused too quickly on plants. But the questions are good, the study system is fantastic, the team is highly skilled, and the proposed budget is a great deal relative to the potential impacts of the research.

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National Science Foundation
2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA
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