26 October 2016

National Science Foundation  
Division of Environmental Biology

Dear NSF-PRFB panel

**Subject: Sponsoring scientist statement for PRFB application of Robert E. Clark.**

I am delighted to provide my support for Robert Clark’s application for an NSF-PRFB based in my group at UConn. I believe that Rob will contribute much to the ongoing research in my group on the effects of forest fragmentation in Connecticut on species interactions while broadening his own research horizon and gaining skills in experimental design and statistical analysis that will advance his career. The research that Rob proposes will establish how modification of disperser communities in forest fragments in Connecticut will disrupt seed dispersal and consequently affect plant population structure and persistence and lead to microevolutionary change. Rob’s research will make extensive use of the biological collections available in herbaria at UConn that provide data on plant locality information and physical specimens. These historical records are critical to understanding the long-term impacts of habitat fragmentation on plant populations.

The key features of Rob’s proposal that enthuse me are 1) the integrative nature of the work, examining the consequences of altered species interactions on population persistence, structure and microevolution; 2) the parallel examination of temporal variation by examining biological collections data and spatial variation using multiple contemporary forest fragments; 3) the likelihood that his work will open up a new angle to ongoing research in my lab on ecological networks in fragmented landscapes. Additionally, I believe that Rob’s intimate knowledge of the natural history of New England’s forests, a system I’m relatively new to, will complement my own expertise in quantitative ecology very well.

Relationship of proposal to ongoing research  
 The research Rob proposes will benefit from synergies with our NSF-funded project (NSF-DEB 1557086, start date December 2016) on how forest fragmentation disrupts food webs involving herbivorous Lepidoptera, their host-plants and avian predators (Fragmented Ecological Networks, FEN). The FEN project will collect detailed data on the effects of fragmentation on antagonistic interaction networks, and Rob’s work on beneficial interaction networks will be an excellent complement to that system. In addition, Rob’s research will benefit from the infrastructure that we are building for the FEN project, including GIS databases on forest fragments in Connecticut including information on accessibility and historical and current use, permits, trained undergraduate research teams, transport and outreach activities. The complementary nature of the two projects will provide excellent opportunities for collaboration and peer-support between Rob and the PDRA employed on the FEN project. Rob has experience providing outreach programs to education, environmental and professional organizations in Connecticut, that will allow Rob to effectively take part in the outreach components of the FEN project that facilitate the outreach goals of the PRFB. This includes talks at local schools and natural history societies, a biodiversity camp for grade 5-9 students in Hartford and insect zoos for parents and children, with programs specific to the topics of the proposal (i.e. biology of ants and forest wildflowers).

Additional projects in my group have developed tools for modeling spatial structures of plant populations as functions of covariates (Replicated Point Pattern Models, RPPMs, Bagchi & Illian, 2015) and we are currently using RPPMs to contrast the effects of hunting on the spatial structures of Amazonian trees with different dispersal syndromes (Bagchi *et al*., in prep). This technique would benefit from being further applied to new systems, such as the ant-mediated seed dispersal in temperate forest understory communities. I therefore expect Rob to use RPPMs as he addresses his second hypothesis that ant-dispersed plants will become more spatially aggregated in small forest fragments.

### Current and pending research support

I am currently supported as the lead PI on NSF-DEB-1557086 (Effects of forest fragmentation on Lepidopteran herbivores of contrasting diet breadth, 2016-19, $610,420). I am also the lead PI on a Swiss-funded project (ETH Research Grant ETH-42 13-1, *The influence of forest fragmentation on biotic interactions involved in tree establishment and recruitment: the consequences for tree species diversity in tropical forests*, 2013-2016,CHF 196,800). I have a proposal pending as an external collaborator (ETH Research Grant, FORESTeR: Functioning and Resilience of Ecosystem Services in Tropical Rainforests, CHF 249,300). As outlined above, there are substantial opportunities for synergies between Rob’s research and NSF-DEB 1557086, but little redundancy because Rob proposes to work on dispersal mutualisms, not antagonistic interactions. There is no funding for an additional PDRA on any current or pending projects.

### Identifying and meeting mentoring needs

Rob will complete a self-assessment (AAAS’s MyIDP career planning tool) on arriving at UConn to outline a mentoring plan for the project and beyond. At the start of his position, we will meet to discuss the following topics: (i) independence required of a post-doc, (ii) research accountability, replicability and transparency, (iii) safety requirements, (iv) productivity and importance of scientific publications and (v) work-life balance. He will be encouraged to participate in seminars in the department on career development in EEB, grant proposal preparation and in the departmental internal peer-review panel for NSF applications (preliminary and full proposals). The Graduate School at UConn arranges regular events for postdocs including workshops on preparing job and grant applications (e.g. by Grant Writer’s Seminars and Workshops), career development and a university-wide postdoc seminar series. Rob and I will identify conferences for him to attend to present results of his research and expand his research network at the start of his position, with an aim to develop both his local and international profile. Progression towards his career goals, as outlined in his mentoring plan, will be evaluated in 6-monthly meetings with me.

### Sponsor’s role in research and training and additional resources

Rob will meet with me nearly daily on an *ad hoc* basis and in scheduled biweekly meetings. He will also participate in biweekly lab meetings. One reason that Rob is particularly keen on joining my group is to learn about experimental design and statistics and I will train him to use R effectively, including mixed-effects models, Bayesian methods (using JAGS and INLA), spatial statistics and simulation-based approaches. I will encourage Rob to simulate the expected responses in each of his experiments and surveys under multiple scenarios prior to collecting data and to optimize protocols and statistical analyses in the light of these simulations. Rob will help me organize the weekly *Statistics in Ecology* seminar, in which participants (graduate students, post-docs and faculty) present their statistical analysis and elicit feedback from their colleagues. This will broaden his statistical toolbox and also give him experience in teaching quantitative techniques to graduate students. I will guide him through the process of writing and submitting manuscripts and, eventually, making job applications.

Rob is enthusiastic about joining a dedicated EEB department at a large R1 institution and the opportunities for collaboration and interaction it provides. The contrast between UConn and the liberal arts environments that Rob has become familiar with to date will broaden his experience of university cultures. The UConn herbarium, which houses the biological collections that will be used in this project, lies within the department and the curator, Dr. Robert Capers, is excited by this proposal. In addition to interacting with me and the PIs, PDRA and collaborators on the FEN project, Rob will interact with the diverse faculty in the EEB department. In particular, Rob will use species distribution models in his research and will benefit from interacting with Prof. Tingley who is an expert on Bayesian species distribution models, including presence-only models that incorporate biological collections data. Rob will also interact with Prof. Urban’s group: Prof. Urban is a leading expert on the consequences of environmental change for microevolution. Both Prof. Tingley and Prof. Urban are aware of Rob’s application are looking forward to collaborating with him.

Limitations regarding the research following fellowship conclusion  
None.

In summary, I am looking forward to collaborating with Rob on this very exciting project. I believe that the hypotheses and approaches that Rob has developed will help us better understand how environmental change modifies species interactions and what the consequences of altered interactions will be for population and evolutionary dynamics. I hope that you agree with me.

Yours sincerely

Robert Bagchi