

**The New England Botanical Club
Graduate Student Research Awards
2019 AWARD WINNER**

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**Do density-dependent feedbacks drive New England
temperate tree seedling growth, survival, and diversity?**

The temperate forests of New England are home to a variety of tree species, but the drivers of local tree distributions and the mechanisms that maintain diversity in these forests remain unclear. While the role of habitat suitability factors such as climate, topography or soil physical and chemical properties in structuring tree distributions has long been appreciated, recent work points to the importance of community interactions. For example, both localized soil pathogens and strong intraspecific seedling competition can result in patterns where tree seedlings are less likely to survive when they grow nearby adults of the same species. The goal of this study is to quantify both these processes for three temperate tree species; *Prunus serotina*, *Betula lenta*, and *Acer rubrum*. We will experimentally plant seedlings beneath adult trees of each species, and measure whether the species identity of the neighboring adult tree influences each seedling's survival and growth. We will also compare the strength of competition between seedlings of the same species to competition between seedlings of different species by manipulating the composition of the seedling communities. Finally, we will track how differences in survival due to these two processes alter the diversity of the seedling communities. Together this will help us envision the potential future demographics and diversity of New England forests.

The New England Botanical Club offers each year up to \$6,000 total in support of botanical research to be conducted by graduate students. The awards are made to stimulate and encourage botanical research on the New England flora, and to make possible visits to the New England region by those who would not otherwise be able to do so. It is anticipated that two to three awards will be given, although the actual number and amount of awards will depend on the proposals received. The awards are given to the graduate student(s) submitting the best research proposal dealing with systematic botany, biosystematics, plant ecology, or plant conservation biology.