

Grant Report: Long-term Survivorship and Species Invasion on a Restored Urban Stream  
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I did my fieldwork on Rocky Branch, a restored urban stream completed in three phases on North Carolina State's campus, providing a unique opportunity to examine plant communities 21 (Phase I), 17 (Phase II), and 13 (Phase III) years post-restoration. At every third 10-meter transect along the stream, we did stem counts, species classification (planted, native volunteer, non-native volunteer, or invasive), and cover class by invasive species and by strata. Planted species were noted in every transect. For planted species, we assessed survivorship and well-performing species and for invasive species, we identified the highest-impact species. The most common planted species by number of stems was *Morella cerifera* (wax myrtle), *Calycanthus floridus* (Carolina allspice), *Ulmus americana* (American elm) *Sambucus canadensis* (American elderberry), and *Liriodendron tulipifera* (tulip-poplar). Importance values additionally showed *Celtis laevigata* (hackberry), *Platanus occidentalis* (sycamore), and *Betula nigra* (river birch) to be common planted species. Shared traits amongst these species include having facultative status, medium to high abundance of fruit and seed, and spreading vegetatively. These high-performing native plants as well as other species that are functionally similar to and share traits with should be considered for future planting lists. Cover class data suggests that the highest impact invasive species are *Hedera helix* (English ivy), *Ligustrum lucidum* (glossy privet), *Microstegium vimineum* (Japanese stiltgrass), *Pyrus calleryana* (Callery pear), and *Ligustrum sinense* (Chinese privet). Indicator species analysis and ordinations of invasive species across phases/successional stages were also conducted. Based on the successional stage, additional species to target will vary assuming resource availability. Overall, future planting lists in the southeastern U.S. should consider facultative species with medium to high abundance of fruit/seed and vegetative growth capabilities. Furthermore, considering the study area has nearly 60% invasive cover, long-term management should be incorporated into all restoration efforts, including assessment of planted species and continued, targeted management of high-impact invasives to ensure long-term success of the restored native plant communities.



Photos: Lauren Willhite conducting vegetation surveys at Rocky Branch, Raleigh, NC.





Photos: Lauren Willhite with her advisor. Dr. Steph Jeffries, (left) and field assistant. Kaya Rosselle, (right)