

The role of herbaceous woodland perennial diversity for improving nutrient uptake of riparian areas – Phase II

Abstract:

Investigation of disturbed and intact woodlands herbaceous understories provided information on species present, biomass production and nutrient capture in preserved and secondary forests.

The number, frequency, and abundance of different understory herbaceous species, especially spring-growing species, are greater in preserved forests than in secondary or disturbed forests, and are important for maintaining biodiversity and contributing to nutrient capture. Certain spring-growing species produce large amounts of biomass and substantially increase nutrient capture in the understory. Including these species in riparian woodland restoration should lead to increased effectiveness for nutrient capture.



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What was done and why?

This research extended an earlier pilot project funded by the Leopold Center to examine nutrient uptake by herbaceous vegetation in intact woodlands compared to disturbed woodlands in central Iowa. For this project, the objectives were to expand on previous work by specifically examining secondary forests, and including a larger number of sites in order to:

- Identify specific perennial herbaceous species that are missing from secondary forests;
- Determine nutrient uptake by herbaceous perennials in intact vs. secondary forest systems, at the plot level for harvested plant material, and develop estimates for the landscape level;
- Identify key functional species with potential for introduction in newly-constructed buffers and in degraded secondary riparian forest areas; and
- Test the establishment potential of different species and species mixes.

What did we learn?

First, findings related to the distinctive nature of flora in systems that are intact versus those that are early-successional, including important differences for spring-growing herbaceous species, extend earlier findings of differences between relatively intact systems and those disturbed by grazing. Second, in this study, which included a wider range of preserved sites, investigators learned that even relatively “preserved” forests may benefit from some restoration of important perennial herbaceous species to improve their function. Finally, the suite of spring-growing species that were studied to assess their biomass production and nutrient content show great promise for reintroduction via restoration efforts to enhance forest function in terms of nutrient capture.

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More details:

www.leopold.iastate.edu/research/grants/2009-1/E2006-03.pdf