

As created wetlands are becoming more common due to compensatory mitigation under section 404 of the Clean Water Act, it has become important to understand how the vegetation community and the soil nutrient availability develop over time in these wetlands. For a created wetland to replace the function of the destroyed natural wetland, the biogeochemical cycling and vegetation community must replicate the natural system. In this study, I sampled the vegetation community as well as the soil and porewater nutrient availability in four created wetlands in southeastern Virginia, all constructed and managed by the Virginia Department of Transportation. All the sites used in this study had areas of dense *Typha* spp. (cattail) stands, which had been identified as problem areas by the site managers. In many of the study sites, the *Typha* populations were removed by cutting and herbicide spraying, due to the assumption that the dense *Typha* stands hinder the biodiversity and therefore reduce the functionality of the created wetlands. This was based on inferences from previous research that indicated *Typha* was an invasive plant in other types of disturbed wetlands. No research had been done to investigate the effect of dense *Typha* stands in created wetlands and whether or not they could be defined as invasive species. The definition of an invasive species that was used throughout this research project, is a population that is able to establish, proliferate, and persist in a new or expanded range or density to the detriment of the endemic community. Invasion often results in lower species diversity and richness. Therefore, I attempted to compare the diversity of the vegetation community in *Typha* dominated assemblages and areas not dominated by *Typha*.

As part of this study, I sampled the composition of the vegetation community and soil nutrient availability both within *Typha* stands and in areas dominated by other species in four created mitigation wetlands. Two of the wetlands were less than 5 years old and two were 15 years old. This allowed comparisons across different types of vegetation assemblages and also between wetlands of different ages. The vegetation community data was used to calculate the Shannon index of diversity and the species richness for each sampling location.

From the data that I collected I was able to show that the dense *Typha* stands do not lower the species richness or the Shannon diversity index of the vegetation community and that no consistent trend can be correlated to dense *Typha* stands. This seems to suggest that *Typha* is not an invasive species in these types of wetlands. However, the species richness and Shannon diversity throughout the created wetlands was lower than what is commonly seen in natural wetlands. This indicates that the problem of low diversity is not related to *Typha* dominance, but is found across various vegetation assemblages in created wetlands. Hopefully the results of this research will result in more management emphasis placed on increasing the diversity of the entire vegetation community, through multiple year plantings, and increased microtopographic relief, instead of management aimed only at *Typha* removal.

I completed and successfully defended my master's thesis in December of 2007 and plan to publish the results of my research in the next year. I will be starting a position as lab manager in the Wetland Biogeochemistry Lab at Louisiana State University in February 2008. I very much appreciate the support of the Garden Club of America and the assistance they gave me in completing my master's degree. I plan to continue to study the ecology of coastal and headwater wetlands throughout my career and hopefully help to inspire other young scientists in the future.