

Effects of Water Willow Establishment on Littoral Assemblages in Kansas Reservoirs: Focus on Age-0 Largemouth Bass

by

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ABSTRACT

A large scale habitat manipulation was conducted to assess the effects of establishing an emergent macrophyte, American water willow *Justicia americana*, on littoral reservoir assemblages. Coves in three large (>1,800 ha) Kansas impoundments were chosen and half planted with water willow. Sampling was conducted during the summer from 2001 to 2004. I found that water willow coves had more complex habitat as well as higher abundance and diversity of fishes, macroinvertebrates, and zooplankton than control coves. However, strong temporal variation in water levels influenced the amount of inundated water willow available in these systems. The effects of water willow on density, growth, condition, and diet of age-0 largemouth bass *Micropterus salmoides* were assessed. Significantly higher densities of age-0 largemouth bass were found in water willow coves, but growth, condition, and diet did not differ between water willow and control coves. Therefore, water willow was able to support higher abundances of age-0 largemouth bass than control coves without affecting growth, condition, or diet. Characteristics of age-0 largemouth bass from the water willow coves were compared to those from two small impoundments (<80 ha) with abundant macrophyte and healthy largemouth bass populations. Small impoundments had higher densities of age-0 largemouth bass than water willow coves in the three large impoundments, but individuals on average also had lower growth, condition, and fewer fish in their diet. Thus, largemouth bass populations in small impoundments may be more regulated by density dependent factors than populations in large impoundments. Overall, water willow is beneficial to littoral areas, supporting an increase in both abundance and diversity of assemblages. Finally, I used a field experiment to test the inundation and desiccation tolerance of water willow for different depths and durations. Water willow was susceptible to inundation, but resistant to desiccation. My findings provide information that can be used to select candidate reservoirs for water willow establishment based on expected water-level fluctuations.