

Public Abstract

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Title:A STUDY OF THE ABUNDANCE, DIVERSITY, AND RECRUITMENT STATUS OF FRESHWATER MUSSELS IN THE MARAIS DES CYGNES RIVER, KANSAS

Freshwater mussels have declined rapidly in North America as a result of various factors including commercial exploitation, habitat degradation, impoundment and channelization, alterations of the natural flow regime, and the introduction of exotics (Williams et al. 1993). Many populations may be on the verge of functional extinction with little reproduction occurring throughout much of their former range. This study examines the status of a mussel assemblage located on the Marais des Cygnes River at the Marais des Cygnes National Wildlife Refuge in Kansas. Four long-term monitoring locations were selected on the river and data were collected at the sites on several parameters that indicate mussel bed quality: density, species richness, extent of the bed, recruitment status, and habitat availability. Total density within the mussel bed at the four sites ranged from 3.0 mussels per meter squared at Site 2 to 8.9 mussels per meter squared at Site 4. The threeridge (*Amblema plicata*) was the most abundant species at all four sites with densities ranging from 1.3 mussels per meter squared to 4.5 mussels per meter squared. Although ranking third among the sites in total mussel abundance and area, the mussel bed at Site 1 had the highest value of species evenness, a greater amount of medium and coarse gravel, and higher numbers of recent recruits in four aged species than the other sites. I determined that annual discharge during the breeding season did not have an impact on recent mussel recruitment of three common species at Site 1: threehorn wartyback (*Obliquaria reflexa*), pimpleback (*Quadrula pustulosa*), and threeridge (*Amblema plicata*) as the distribution of individuals was even across spawning years for each species. In contrast there was no evidence of butterfly (*Ellipsaria lineolata*) recruitment in years when mean monthly discharge was high from June to August, the months which coincide with the reported breeding season. Episodic recruitment associated with long periods of lower than average flows throughout the summer months may partially explain the rarity of the butterfly mussel on the River. Verifying the identity of the host fish for butterfly glochidia on the Marais des Cygnes River, the timing of early life cycle events, and studying the seasonal feeding ecology and movements of the host fish on the River is necessary to help guide future conservation efforts of this threatened species. Mussels generally occupied areas with high amounts of medium and coarse gravel and low depth within a particular site but other factors including local shear velocity and bed stability at higher flows may be limiting their distribution. Future studies on the Marais des Cygnes River should include repeating the survey protocol at the four sites to investigate changes in total abundance, species composition, habitat, and recruitment through time and examining the potential causes of successful mussel recruitment at Site 1 compared to the other locations.