MULTI-SCALE RESOURCE SELECTION OF NIANGUA DARTERS IN THE OSAGE RIVER BASIN, MISSOURI

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ABSTRACT

Understanding temporal and spatial habitat relationships is important to the recovery of the federally threatened Niangua darter *Etheostoma nianguae*, and other imperiled freshwater fishes. We evaluated resource selection of Niangua darters at four spatial scales within the Osage River Basin in Missouri in 2010 and 2011. At the macrohabitat- and reach-scale, depth and velocity had the greatest influence on Niangua darter presence. Niangua darters occupied macrohabitats with depths of 41.4 cm and velocities of 0.20 m s^{-1} and reaches with depths of 38.5 cm and water velocities of 0.26 m s^{-1}. At the watershed-scale, soil and geology characteristics had the greatest influence on the presence of Niangua darters. Streams originating from watersheds dominated by: limestone and dolomite bedrock geology, soils with relatively greater infiltration rates and lower transmission rates, and greater relief have the greatest likelihood of containing Niangua darters. We also evaluated microhabitat-scale selection of adult Niangua darters among seasons in two Missouri Ozark streams from July 2011 to May 2012. Overall Niangua darters selected relatively shallower depths during summer compared to spring and fall. Substrate embeddedness and habitat type also fell within the 90% confidence set of candidate models along with depth in spring and fall, respectively, however results differed between streams. We were unable to detect Niangua darters during winter as they may be using subsurface refugia or migrating outside of sample reaches.