

FISH COMMUNITY RESPONSE TO HABITAT ALTERATION: IMPACTS OF SAND DREDGING IN THE KANSAS RIVER

by

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ABSTRACT

In-stream dredging is a common practice in rivers worldwide that can affect fish and fish habitat. We investigated the magnitude of these alterations and their influence on the fish community of the Kansas River, a large sand bed river. Fishes were collected monthly from June 2010 to June 2011 in Edwardsville and Lawrence, KS from 12, 1-km reaches (three actively dredged, two historically dredged that have not been dredged in at least one month, and seven control reaches) with bottom trawls, seines, and electrofishing. Water depths and velocities were measured with an acoustic doppler current profiler and interpolated in ArcGIS at all 12 reaches. Actively dredged reaches had proportionally more deep water habitat (> 3 m) and lower velocity (< 0.15 m/s) near the river bed than control reaches ($P < 0.01$ and $P = 0.04$, respectively). However, the mean proportion of shallow water habitat (< 0.5 m), high velocities near the river bed (> 0.30 m/s), low velocity habitat (< 0.25 m/s), and high velocity habitat (> 0.75 m/s) were similar among all reach types ($P_s > 0.05$). A canonical correspondence analysis was used to characterize relationships among habitat variables, reach types (actively dredged, historically dredged, and control), and catch per unit effort (CPUE) of fishes in the Kansas River. Mean velocity and depth explained a significant amount of variation in species CPUE; however, reach type was not a significant factor for any of the gear types for any season. Our results show that dredging in Great Plains Rivers can increase depths, but alterations to fish community structure was not evident, likely because many of these fishes are adapted to a range of habitat conditions and are highly mobile.