1st NSERC HydroNet Symposium, Winnipeg Delta

April 29thand 30th, 2011

**Response of Arid River Fish Assemblages to Environmental Flow Regulation.**

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Abstract

Data collected from 1993 to 2010 in the San Juan River, New Mexico and Utah was used to quantify interactions among native and nonnative fishes and their responses to flow regime attributes. Discharge in the San Juan River was partially manipulated by dam releases to simulate naturally high spring flows in this snowmelt-driven river system. Daily discharge, water temperature and catch rates of a dominant nonnative predator, channel catfish *Ictalurus punctatus*, were obtained from the primary channel. Annual autumn monitoring of fish assemblages in secondary channels, which primarily characterized abundance of young-of-year fishes, was conducted over the same period. An information theoretic approach was used to rank candidate models that predicted species densities based upon selected combinations of abiotic and biotic factors. Annual variation in densities of native fishes was less than that of nonnative fishes. Top ranked models for native species included positive associations with small-bodied nonnative fishes but negative associations with abundance of adult *I*. *punctatus*. Mean spring discharge was positively associated with densities of native speckled dace *Rhinichthys osculus* and flannelmouth sucker *Catostomus latipinnis*, but not bluehead sucker *C. discobolus*. With the exception of juvenile *I*. *punctatus*, the top candidate models predicting densities of nonnative fishes all included duration of low summer flows. Our results demonstrated different responses of native and nonnative fishes to flows, but densities of all fishes were generally lower in years with greater abundance of adult *I*. *punctatus*. Flow management in the San Juan River over the past 18 years has maintained stable populations of common native fishes, but managers should consider manipulations of seasonal flows as well as developing novel approaches to suppress nonnative predator populations to restore and maintain the entire native fish community.