

Public Abstract

First Name:Meagan

Middle Name:Denise

Last Name:Montgomery

Adviser's First Name:David

Adviser's Last Name:Galat

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2016

Department:Fisheries & Wildlife

Degree:MS

Title:Science and management of river-floodplain connectivity for fish movement and recruitment: a case study of a managed wetland on the lower Missouri River

Restoration projects along the lower Missouri River (LMOR), Missouri, are undertaken to mitigate past channelization and levee construction that severed river-floodplain connectivity and denied riverine fishes access to adjacent seasonally flooded wetlands. Two managed wetlands were constructed at Eagle Bluffs Conservation Area (EBCA) and designed with water-control structures to enable controlled fish passage between the lower Missouri River (LMOR) and wetlands as part of the Missouri River Recovery Program. Lateral fish movements during temporary connectivity events between LMOR and these wetlands were investigated during two consecutive spring-summers. Objectives were to model river-floodplain connectivity, predict fish use of floodplain wetlands, and evaluate lateral fish movement to assess benefits and management options of lateral connectivity for fish recruitment. Connectivity events over the 1993-2008 modeled period typically were frequent (median: 7 events per year), in late spring (median: 1 June start date), and of short duration (median: 4 days). Over 60 species used the wetlands during the two study years, but only 12 taxa composed >1% of the export fish assemblage either year. Fish biomass exported from EBCA to LMOR was high (2007: 509 kg/h; 2008: 1458 kg/h) and dominant fish lengths <200 mm demonstrated substantial recruitment of young-of-year and juvenile fishes during wetland inundation and isolation. This is one of the few studies to quantify biomass export to a large river from a floodplain wetland and demonstrates the value of managed floodplain wetlands to annual recruitment of riverine fishes. Results show how river-floodplain connections, especially those associated with large flood pulses, benefit recruitment of both favored native species and invasive Asian carps. Such knowledge can guide management and conservation efforts to promote or regulate targeted fish species.