

**SCIENCE AND MANAGEMENT OF RIVER-FLOODPLAIN CONNECTIVITY
FOR FISH MOVEMENT AND RECRUITMENT: A CASE STUDY OF A
MANAGED WETLAND ON THE LOWER MISSOURI RIVER**

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ABSTRACT

Two wetlands at Eagle Bluffs Conservation Area (EBCA) with water-control structures designed for fish passage between the lower Missouri River (LMOR) and wetlands were studied. 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). Thirty-eight species were predicted, with the majority of those starting to spawn between 10 to 21 °C (4 April to 1 June). Over 60 species used the wetlands during the two consecutive 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 wetlands to annual recruitment of riverine fishes. Restoration and management that enables long duration, large magnitude river-floodplain connections in late spring followed by short-to-moderate duration wetland inundation and isolation fosters young-of-year fish recruitment of a rich variety of taxa on LMOR.