

**REMEDIATING EFFECTS OF HUMAN THREATS ON LOTIC FISH ASSEMBLAGES
WITHIN THE MISSOURI RIVER BASIN: HOW EFFECTIVE ARE CONSERVATION
PRACTICES?**

Jeffrey D Fore

Drs. Scott P Sowa and David L Galat, Dissertation Supervisors

ABSTRACT

To develop tools that can improve agricultural conservation, I: 1) assessed total watershed condition and where agricultural conservation practices (CPs) are likely to be effective (hereafter primary management capacity) of stream segments in Missouri River basin by conducting a threat assessment, 2) assessed agricultural soil CP effectiveness, and 3) developed a decision support framework to improve strategic conservation planning. Agricultural threats were the most prevalent source of potential ecological stress, and 60% of stream segments were classified as under primary management capacity of U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). Modeled relationships among NRCS soil CPs and fish guild abundance indicate CPs have the potential to reduce impacts of agricultural sources of stream sedimentation. Applied NRCS soil CPs were predicted to improve fish assemblage condition in 2% of evaluated watersheds and additional CPs were needed to improve fish assemblage condition in up to 11 and 17% of stream segments in evaluated ecoregions. The decision support framework was used in a case study to identify a subset of watersheds with degraded fish assemblages under NRCS primary management capacity. In these 2,633 watersheds, I estimated the amount and cost of CPs required to meet ecological objectives so that managers can make strategic conservation decisions and appropriately allocate conservation resources.