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Warm Springs Creek Flow and Sediment Study

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Abstract Text:

The Toston Irrigation District (TID), located six miles southwest of Toston, Montana, comprises approximately 6,500 acres of full irrigation service lands in Broadwater County. Warm Springs Creek (WSC) runs along the western edge of the district and the Toston Canal runs along the south-eastern portion. Water for irrigation is diverted to the project from the Missouri River by way of a pumping station and is typically delivered April through October. The U.S. Bureau of Reclamation (Reclamation) initiated compliance with mitigation measures outlined by a Finding of No Significant Impact (FONSI) and contracted Montana State University Extension Water Quality (MSUEWQ) to assess current flow and sediment patterns in TID. The overall goal of the project was to attempt to measure or estimate irrigation season amounts of water and sediment contributed to WSC by TID and attempt to define fluctuations within the Toston Canal itself. The majority of water diverted from the Missouri River into the Toston Canal is diverted from the canal along the upper reaches of the district. Therefore, a significantly smaller quantity of diverted water actually makes it into WSC via the Toston Canal under normal circumstances. However, greater seasonal flow in the north end of the district is likely due to contributions to WSC from sources outside the district and TID return flow. Defining base flow of WSC and non-irrigation and irrigation season flow and sediment loads, allowed a more accurate definition of contributions to WSC from TID on a yearly basis. Increased sediment loads downstream are more likely a result of changing soil types, increased muskrat activity and livestock access to WSC than irrigation practices. A similar trend of increasing sediment after WSC leaves TID is seen regardless of irrigation. Although TID is not a major source of sediment data suggest the canal contributes over half the flow in WSC. However, large fluctuations outside the district are more likely a factor of precipitation events.

Impact Statement:

MSUEWQ provided a valuable service in answering concerns raised during completion of environmental studies related to converting water service contracts to repayment contracts. Data gathered by MSUEWQ was used to craft appropriate solutions to concerns related to agricultural, fisheries, and other water quality issues in the Toston Irrigation District.