

# FISH BYPASS CHANNEL DESIGN AND EVALUATION AT HUNTLEY DIVERSION DAM, YELLOWSTONE RIVER, MONTANA <sup>AFS</sup>

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Huntley Diversion Dam was built by the Bureau of Reclamation in 1906 to convert an arid region east of Billings, Montana into a sustainable agricultural land. This irrigation diversion dam, which diverts water from the Yellowstone River, is constructed of a concrete capped weir with a hydraulic height of eight feet. The differential water height created by the dam results in a nearly vertical plunging flow and is considered a total barrier to upstream fish migration. In 1998 the Huntley Irrigation District initiated a study to design a fish pass for the dam to coincide with some major dam reconstruction related to dam safety measures. The design for fish passage is a rip-rap roughened channel built around the north abutment of the dam. The fish passage channel was constructed under the premise that it would operate over the wide range of river stages experienced at the dam site and provide favorable attraction conditions for migratory fish species attempting to move upstream. An ongoing evaluation of the fish passage at the Huntley Diversion Dam is investigating whether and how fish are utilizing this channel and possible changes that could be employed to improve passage. Results from the first year of study indicate that fish are found throughout the channel with high densities of native flathead chub and silvery minnows present in the lower section of the channel. A variety of techniques and methods used to measure passage of fish within the channel have been utilized, including fyke nets, trap nets, side-scanning hydroacoustics, time-lapse videography and electrofishing. Evaluations in 2002 will include increased efforts to determine fish movement through the channel with a new fish counting device designed for use in flowing water.