

# Maybell Diversion Restoration and Headgate Modernization Project - 2021-2024

*Client:* The Nature Conservancy

*Owner:* Maybell Irrigation District

*Reference:* Jennifer Wellman, Freshwater Project Director – Northwest Colorado – [jennifer.wellman@tnc.org](mailto:jennifer.wellman@tnc.org)

*Project Location:* Yampa River, Maybell, Colorado

*Name of Project Manager/Engineer:* Quinn Donnelly, PE

*Total Project Costs:* \$6,800,000

**Brief Description of Project:** The project, led by The Nature Conservancy (TNC), and in collaboration with the Maybell Irrigation District (MID) sought to restore and improve the Maybell Diversion, a 120-year old diversion structure on the Yampa River in northwest Colorado. The existing diversion was a loose collection of boulders across the Yampa River in Juniper Canyon. Its unstable nature required rework occasionally after high water events and during extreme low flow periods. The structure was often a barrier for resident and migrating fish, including the listed Colorado Pike Minnow (*Ptychocheilus Lucius*). The configuration of the structure made boater navigation across the diversion difficult, especially at lower flows.

As a sub-consultant to J-U-B Engineers, RiverRestoration worked with TNC and MID collaboratively to develop a comprehensive design that met the project goals of improved ditch management to increase in-stream flow, automated water delivery, improved fish passage, and improved boat passage through the project reach. The project mitigated the 12 feet of head loss over the structure with a series of boulder weirs and roughened ramps. 2D hydraulic modeling was used to design the fish passage and boat passage elements. The design incorporated aquatic organism passage structures that negated the need for fish to jump between pools, which improved the chances of success for the native fish, including Colorado Pike Minnow and Razorback Sucker. Channel and bank stability was also a primary concern in the design process, as the Yampa River through Juniper Canyon can reach 17,000+ cfs during runoff, in a 90-120 wide channel with no

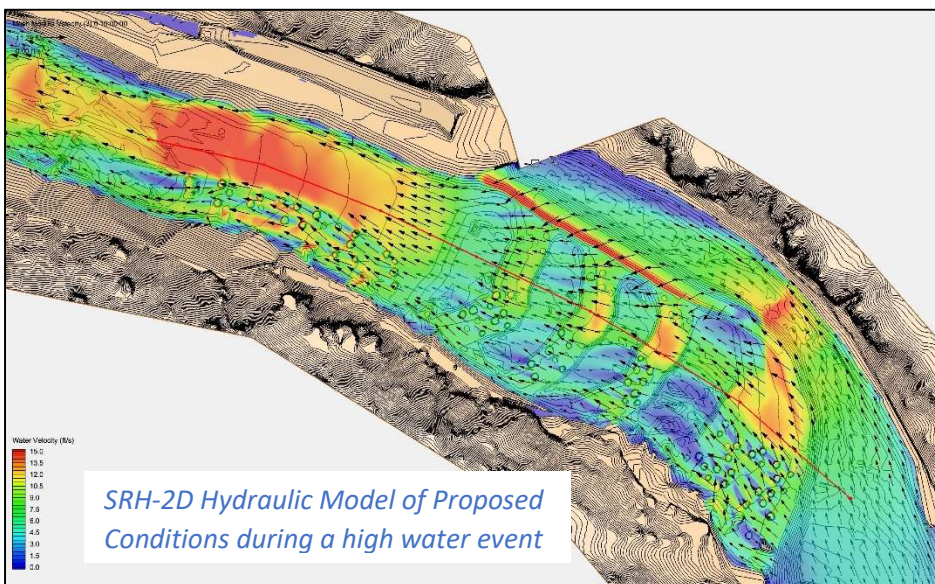


*Maybell Diversion structure prior to construction*



*Maybell Diversion at substantial completion*

floodplain, resulting in extreme channel velocities and shear stresses. RiverRestoration took the lead on the in-channel components, and worked on many aspects of the project, including site assessment, hydrographic survey, concept designs, stakeholder and river user coordination, hydraulic design using SRH-2D and HEC-RAS, local floodplain permits, construction documents, and bid support. RiverRestoration also played a key role during construction, providing technical guidance, performing observations, and ensuring the project was built to the plans and specifications.



*SRH-2D Hydraulic Model of Proposed Conditions during a high water event*