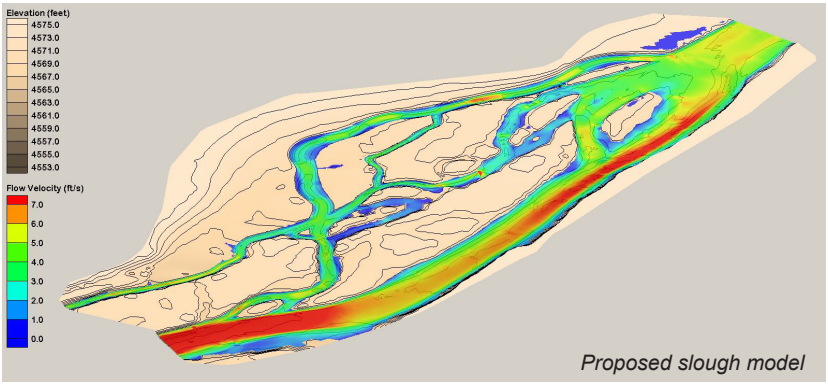
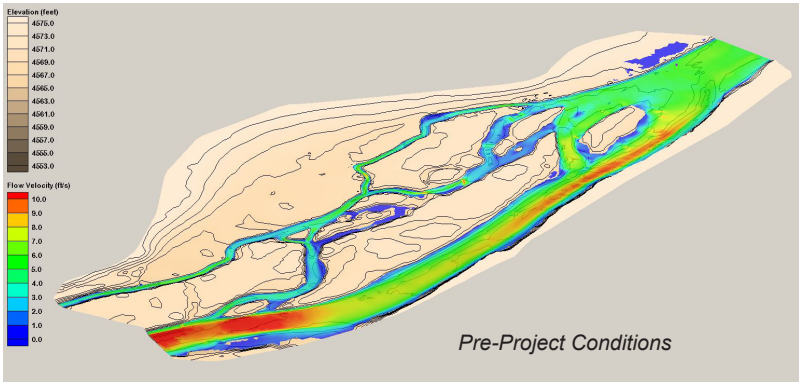
RiverRestoration was retained by the City of Grand Junction to enhance and restore the riparian and riverine function of the Colorado River within Las Colonias Park in Grand Juction, CO. A slough channel was designed to be realigned through the reclaimed fill of the Climax Uranium Mill and function with the current hydrologic conditions of the Colorado River. The proposed slough was hydraulically modeled to ensure that low flow targets in the main stem of the river would not be impacted by the project. Hydraulic modeling was also implemented to evaluate habitat metrics for endangered fish species Bonytail Chub (Gila elegans), Humpback Chub (Gila cypha), Colorado Pikeminnow (Ptychochelius lucius), and Razorback Sucker (Xyrauchen texanus). In addition, stagnate pooling was minimized with the proposed slough design in order to avoid increasing habitat for non-native fishes which have been shown to prey on and out-compete native populations of fish.





Numerical modeling of existing conditions within Las Colonias Park in Grand Junction, CO. Surface LiDAR data were combined with surveyed bathymetry and 2D hydraulics were modeled to serve as a baseline for design. Model parameters were calibrated based on surveyed water surface elevations over a range of flow rates.

The calibrated existing conditions model was used to develop an upstream rating curve for water surface elevation and flow rate within the Colorado River. The rating curve was referenced while designing the inlet structure for the proposed slough channel and provided confidence that the low flow targets in the main stem would remain un-affected by the project. Node strings were created in the mesh surface of the model to monitor flow rates in the existing and proposed sloughs and ensure that the flow distribution among existing sloughs and the main stem of the river would remain relatively unchanged with the project.

LAS COLONIAS SLOUGH RESTORATION

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RiverRestoration performed hydrographic survey of 2 miles of the Colorado River and side channels at high flows with a sounder integrated with RTK GPS. Additional hydrographic survey at low flows included bed material samples, vegetation charcteristics, water surface elevations, control structure inverts and pothole excavations to locate anchient river beds with stable cobble substrates.

The inlet structure was hydraulically designed to regulate high flows and to cutoff extreem low flows. High flow regulation was nessassary to reduce potential for significant uncontrolled ponding and head building in the adjacent park which could have scour and avulsion potential over the one-half mile realignment. Low flow regulation required that the channel be cutoff from the mainstem at a specific discharge to me etwater right restrictions and delivered flow releases from upstream reservoirs.

RiverRestoration performed all aspects of geomorphically sizing and designing the channel dimensions, distributing the gradient over a patterend riffle pool sequence and designing a meander planform to fit the morphology and bed substrate. Over the one-half mile distance 6 riffle pool sequences and accompanying meanders were installed. RiverRestoration provided construction oversight and field modifications to address unforseen circumstances in the exposed bed materials.

Riffle structures were designed with sized substrate to be stable through the range of flows. The final outlet control and channel structure were designed to convey the incomming flow rates without creating a flood hazard or excessive backwater at high flow rates. Bio-stabilization, riparian restoration and recreational access feature designs are ongoing.

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