

North River Valley Park – Low Head Dam Improvements 2017-2020

Client: City of Ames, Water & Pollution Control Department

Owner: City of Ames, Iowa

Project Location: South Skunk River, Ames, Iowa

Name of Project Manager/Engineer: Quinn Donnelly, PE

Brief Description of Project: The primary purpose of the North River Valley Park project was to modify a low head dam that created a major hazard for river recreation and blocked upstream fish passage. The dam was originally built to increase water depths over the City’s aquifer recharge area which is located upstream of the site. However, the structure created a dangerous recirculating hydraulic at high flows, a common occurrence at traditional low head dams sometimes referred to as “drowning machine”. The City desired a modification to the structure that maintained the upstream pool elevation and eliminated the dangerous hydraulic while providing in-channel recreation opportunities and improved fish passage through the project reach. Flood conveyance was also a design concern.

To address the project goals, the team worked with the stakeholders to develop proposed improvements that included two channels, one channel with seven drops for fish and boat passage and one channel with four drops for whitewater recreation. The whitewater recreation was designed for beginner to intermediate level boaters and provides areas for practicing fundamentals such as ferrying, side surfing, getting in and out of eddies. The design incorporated grouted boulder in select areas for added stability and improved whitewater performance. In addition to the in-channel work, the design created a lowered floodplain bench that allowed easier access to the river from the adjacent park and added flood conveyance. Take-out/put-in ramps were added above and below the features for river users that want to portage around the project.

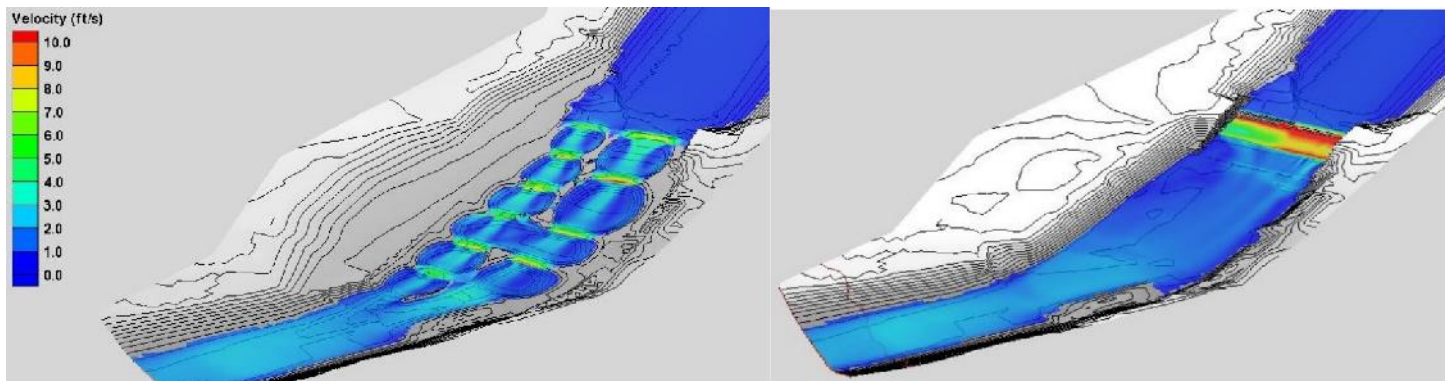
The team utilized 1-dimensional and 2-dimensional hydraulic models to dial in the upstream pool elevation and determine the flow split between the two channels at a wide range of flowrates. The models provided valuable insight into the project’s performance and became a great tool for communicating the project design to stake holders and regulators.



Low head structure prior to construction



Upper half of project post-construction



SRH-2D Hydraulic Model of Project – Completed Project on Left, Existing on Right

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The project team worked on all aspects of the project, including concept designs, stakeholder and river user coordination, fundraising, hydraulic design, 404 Permit with the Iowa Department of Natural Resources and the USACE, local floodplain and grading permits, construction documents, and bid support. RiverRestoration also provided support throughout construction, working with the City of Ames, Iowa DNR, and the contractor to overcome numerous challenges related to excessive sand present in the existing channel, weather, and long periods of high streamflow.



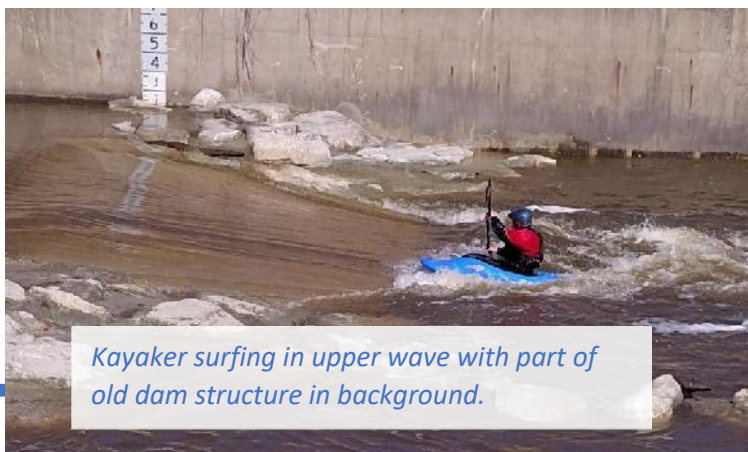
Working with the contractor during construction.



In its first season, the project has already seen a lot of activity and feedback from the local paddling community has been positive. The finished project has turned a hazardous section of the river fenced off from the public into a community amenity that encourages interactions with the river and provides a local spot for paddling, fishing, or relaxing on the bank.



The complete project in 1st season. Vegetation in early stages of establishment on new bench.



Kayaker surfing in upper wave with part of old dam structure in background.



Kayak surf lesson in lower waves