

## Evaluating Effectiveness of Floodplain Reconnection Sites along the Lamoille Valley Rail Trail: A Blueprint for Future Rail/ River Projects

### PROJECT TITLE

Evaluating Effectiveness of Floodplain Reconnection Sites along the Lamoille Valley Rail Trail: A Blueprint for Future Rail/ River Projects

### STUDY TIMELINE

September 2018 – August 2020

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More information about the VTrans Research Program, including additional Fact Sheets, can be found at:  
<http://vtrans.vermont.gov/planning/research>

### Problem Statement

Modification of historic rail beds to reconnect floodplains is a river restoration practice with great potential, but which must also consider the multiple uses and functions of river and rail corridors, along with the potential impacts and benefits to adjacent infrastructure, life safety and health, and the environment.

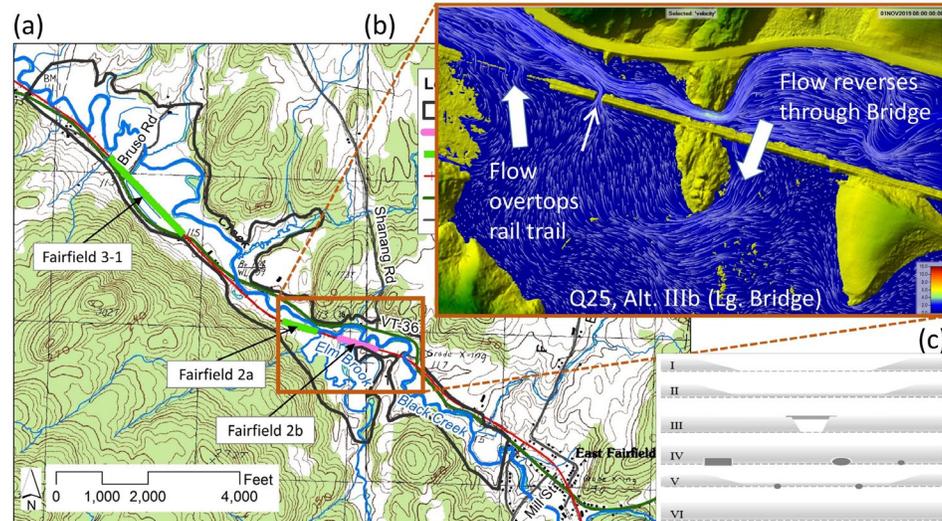


Figure 1. (a) Hydraulic modeling extent along the Lamoille Valley Rail Trail and VT Route 36, East Fairfield, VT. (b) Simulation of enhanced cross connection between Black Creek and Elm Brook floodplains during a flood of 25-year recurrence interval. (c) Six modeled rail modification alternatives.

### Methodology

We used a 2D hydraulic model (HEC-RAS) to simulate various rail berm modifications (e.g., bridges, culverts, rail berm lowering) at the Fairfield 2b demonstration site.

### Next Steps

The modeled reconnection alternatives resulted in modest changes in floodplain inundation depths and velocities in both the Black Creek and Elm Brook floodplains. Historical research revealed an unexpected, existing degree of cross connection between these floodplains, which supports these findings. Results are informing an adjacent wetland restoration project in the Elm Brook floodplain. A framework for a holistic analysis of reconnection opportunities has been developed, which could be widely applied to floodplain reconnection sites across Vermont and beyond.

### Potential Impacts and VTrans Benefits

The hydraulic model will be used to support quantification of potential sediment and phosphorus attenuation under floods of various recurrence intervals in the three-mile model domain under VTrans' Phosphorus Control Plan. A screening protocol has also been developed for stakeholders to identify and prioritize potential floodplain reconnection sites along river & rail corridors.