

Functioning Floodplain Initiative

Presented by: Staci Pomeroy, VT's DEC River Program

Trout River confluence with Missisquoi, photo by Staci Pomeroy

Hello, My Name is Staci Pomeroy; I work for Agency of Natural Resources, Department of Environmental Conservations, Rivers Program; I lead our Physical Science Section.

Today I will provide an overview of our Functioning Floodplain Initiative work.


Functioning Floodplains & Rivers

Meet Our Objectives for:

- Water Quality
- Flood Resiliency
- Ecological Integrity

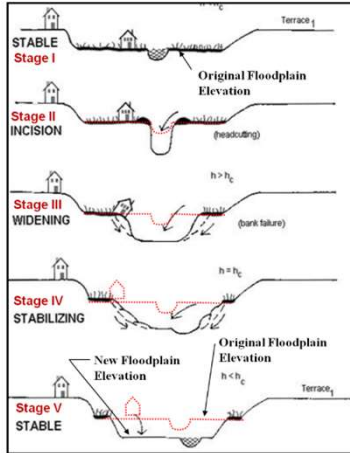
Link to Learn More: <https://dec.vermont.gov/rivers/ffi>

February 7, 2025 | 2

 VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

At a high level, the Functioning Floodplain Initiative work is focused on, protecting, restoring, and enhancing the natural functions of VT’s rivers and floodplains; to be able to meet our goals of water quality, flood resiliency, and ecological integrity.

What Happens?



Schumm Channel Evolution Model (1977)

February 7, 2025 | 3



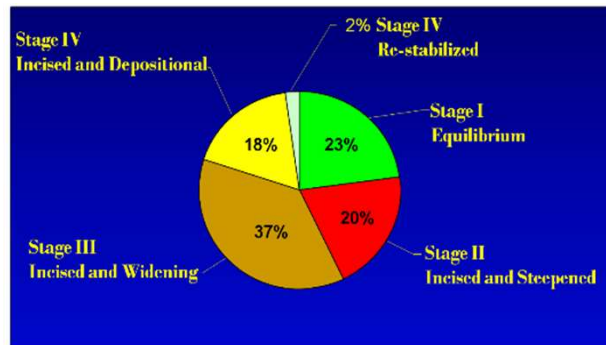
When the river and floodplain are no longer connected, the channel is asked to hold more water during bigger floods.

This creates more power in the channel and causes the river to adjust to this new level of power; through erosion of bed and banks.

The Schumm Channel Evolution Model demonstrates the type of channel process we often see in VT's rivers when they have lost access to their floodplains.

Why does this matter?

- 2,000 VT river miles assessed.
- 75% undergoing Channel Adjustment and Loss of Floodplain Access.



February 7, 2025 | 4



From Stream Geomorphic Assessment work done throughout VT, we see that around 75% of our rivers are in some state of adjustment.

These streams are more sensitive to changes in the watershed inputs to the system and, during flooding events.

How do we make changes?

Corridor Planning, Protection, Restoration, and Regulatory



RIVER CORRIDOR PLANNING



RIVER CORRIDOR PROTECTION



RIVER RESTORATION



STATE PERMITS

February 7, 2025 | 5



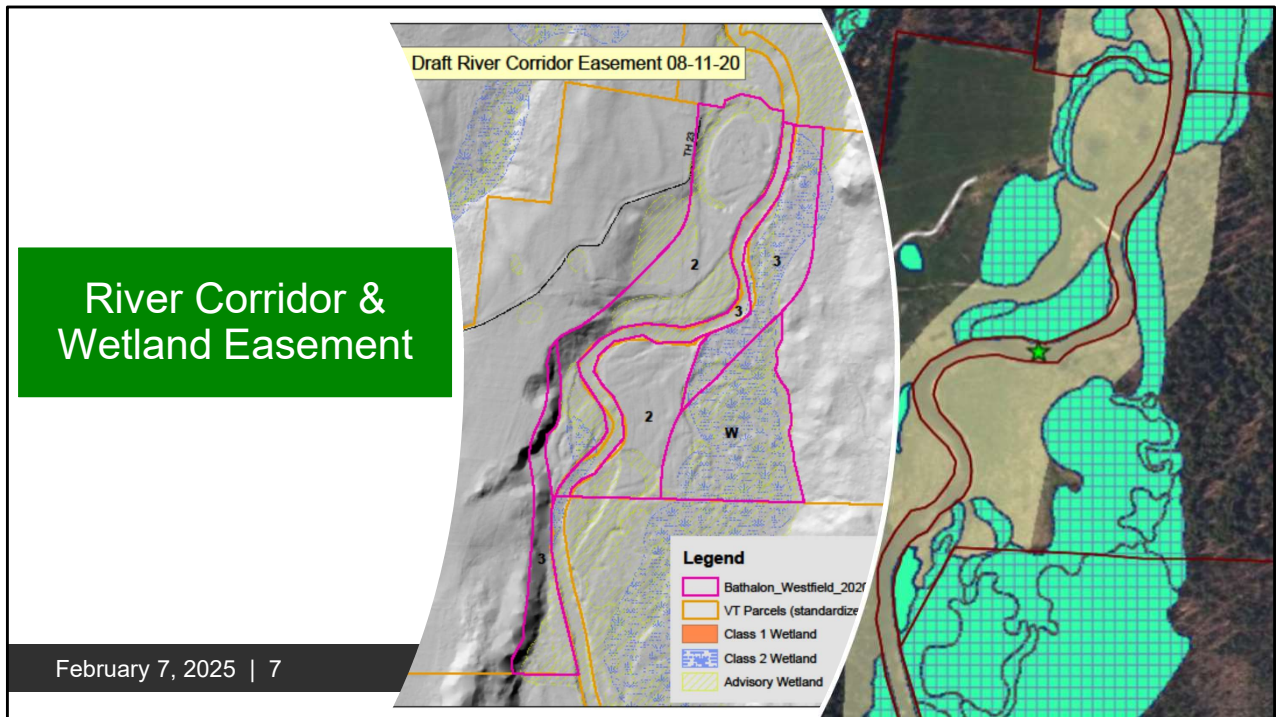
It takes many strategies, including corridor planning, protection, restoration, and regulatory efforts to keep our floodplains and rivers connected.

What types of efforts are happening?

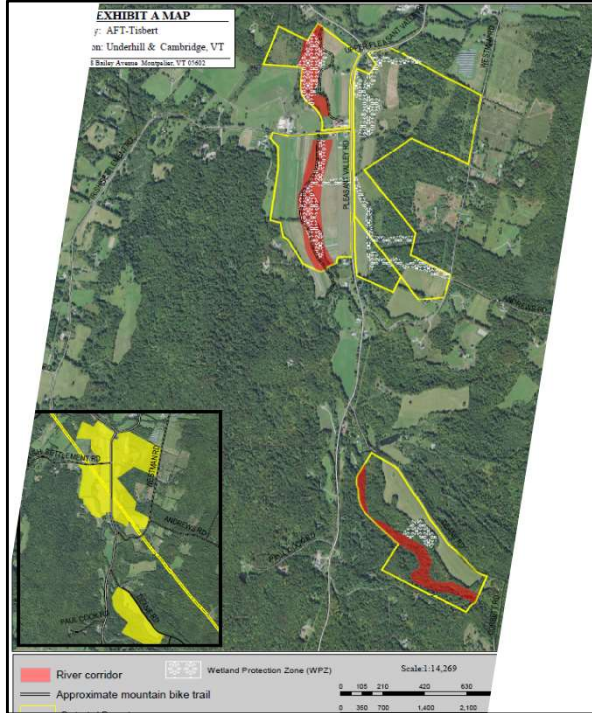
February 7, 2025 | 6



I'd like to share with you some examples of the work happening across VT to meet the goals of the Functioning Floodplain Initiative.



River Corridor and Wetland Easements are a key strategy to provide long-term protection of areas that provide floodplain and wetland water quality, wildlife and habitat, and flood resiliency benefits.



River Corridor & Wetland Easement Program

Easement Stats:


- ▶ **118** RCE projects completed
- ▶ Covering **2,808** acres
- ▶ Along **70** miles of stream



The State's Rivers Program, supports the River Corridor Easement program funding that helps our land trust partners implement these projects across the state.

We have closed on 118 projects, that cover 2,808 acres, and 70 miles of stream.

Encroachment Removal


FEMA
MITIGATION POLICY – FP-108-024-01

III. POLICY STATEMENT:
 FEMA will allow the inclusion of environmental benefits in benefit-cost analyses (BCA) to determine cost effectiveness of acquisition projects.

IV. PURPOSE:
 The purpose of this policy is to identify and quantify the types of environmental benefits that FEMA will consider in the BCA for acquisition projects.

Table I. Annual Estimated Monetary Benefits per Acre per Year

| Environmental Benefit | Green Open Space | Riparian |
|---------------------------------|------------------|-----------------|
| Aesthetic Value | \$1,823 | \$582 |
| Air Quality | \$204 | \$215 |
| Biological Control | -- | \$164 |
| Climate Regulation | \$13 | \$204 |
| Erosion Control | \$65 | \$11,447 |
| Flood Hazard Reduction | -- | \$4,007 |
| Food Provisioning | -- | \$609 |
| Habitat | -- | \$835 |
| Pollination | \$290 | -- |
| Recreation/Tourism | \$5,365 | \$15,178 |
| Storm Water Retention | \$293 | -- |
| Water Filtration | -- | \$4,252 |
| Total Estimated Benefits | \$7,853 | \$37,493 |

Background



February 7, 2025 | 9



There is a lot of benefits to continuing to look at our floodplains and river corridors for flood resiliency.

FEMA’s mitigation policy now allows for Environmental benefits as part of our cost/benefit analysis (BCA); making many projects better able to meet the BCA and be funded through Federal mitigation funds.

Encroachment removal can help reduce people being at risk during flooding and providing areas where floodplain restoration could happen to help reduce impacts during future floods.



The removal of dams no longer in use, and the upgrading of our culvert and bridge infrastructure allows for: better transport of water, sediment and debris across the stream network; reduces risks during flooding of structures failing; and improves the passage of fish and other wildlife along the river and floodplain corridor.



Process Based & Wood Restoration

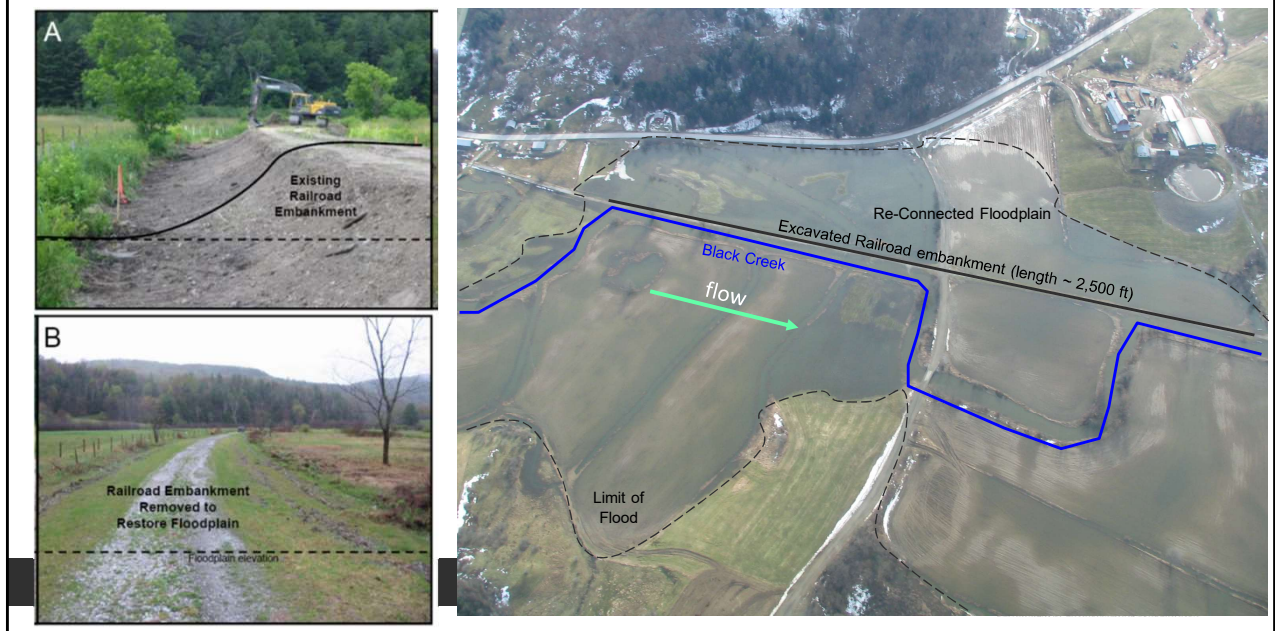
Before (2018) / After (2022) - Photos by Jud Kratzer – VT FW
Spaulding and Stevens Brooks & West Branch Moose River



In many of our rivers, wood coming into the stream has been seen as an issue and has been removed.

Research throughout the US and in VT by our VT Fish & Wildlife Department, has shown that wood is important to streams to maintain habitat, help keep our streams connected to their floodplains, provide areas of sediment and debris storage throughout the system, create roughness in the channel to help slow velocities, and provide bed and bank stability along the channel.

Berm Removal & Floodplain Connection



Full or partial removal of berms, and other active floodplain restoration projects are aimed at reconnecting areas previously disconnected from the river.

These new areas of connected floodplain provide important areas of additional storage during for flood water, and sediment and nutrients in the watershed.

Riparian Plantings



Tree planting in our riparian and floodplains provides multiple benefits.

Trees take a long time to grow and need some help early on to be successful. Finding resources to support both the planting and maintenance during the early stages of the project, will ensure long-term success of these projects.

- * **Municipal River Corridor & Floodplain Bylaw Adoption**
- * **State Floodplain River Corridor Permit,**
- * **State Stream Alteration Permit**
- * **Act 250 / Section 248**
- * **Acts: 137** (1999), **110** (2010), **138** (2012), **121** (2024)



February 7, 2025 | 14



Municipal bylaws, State Permits, Act 250 & Section 248; and many of the Acts past after historic flooding events, all contribute to maintaining and enhancing the connections between our rivers and floodplains.

- 1999 - Act 137 explored the type of damage experienced, reasons behind the different types of damage, what worked and didn't work, and what are ways we may prevent that damage in the future
- In 2010 the state passed Act 110 to further efforts around flood resiliency planning. It created a State policy to protect river corridors in order to reduce property loss & damage, promote public safety, control water pollution and protect fish and wildlife habitat
- Act 138, was passed in 2012.: ANR - regulate activities exempt from municipal regulation; develops and make available river corridor maps for all municipalities and incentives for adoption; Stream Alteration Rule – Emergency protective measures standards and covers berms; and develops training to improve response and reduce impact from future flooding

- Flood Safety Act 121 – In response to historic flooding in 2023 and 2024 – State will regulate River Corridors for streams greater than 2 sq. miles

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How do we track our progress?

February 7, 2025 | 15

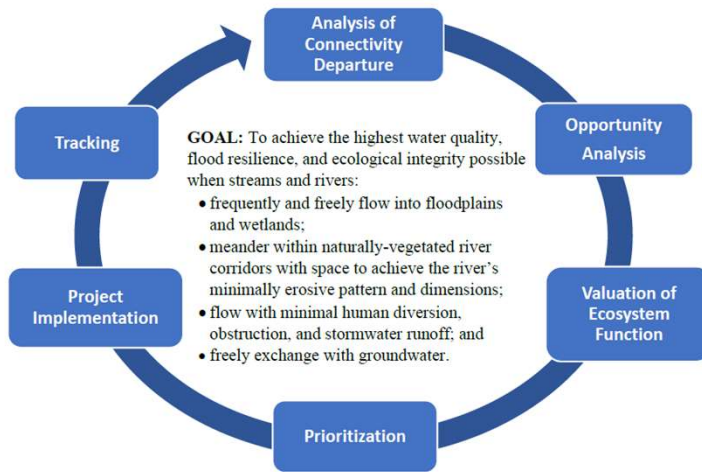


To understand how we are reaching our goals there is a need to track our progress.

FFI Tool

Project Benefits
Water Quality,
Flood Resiliency
and Habitat

February 7, 2025 | 16



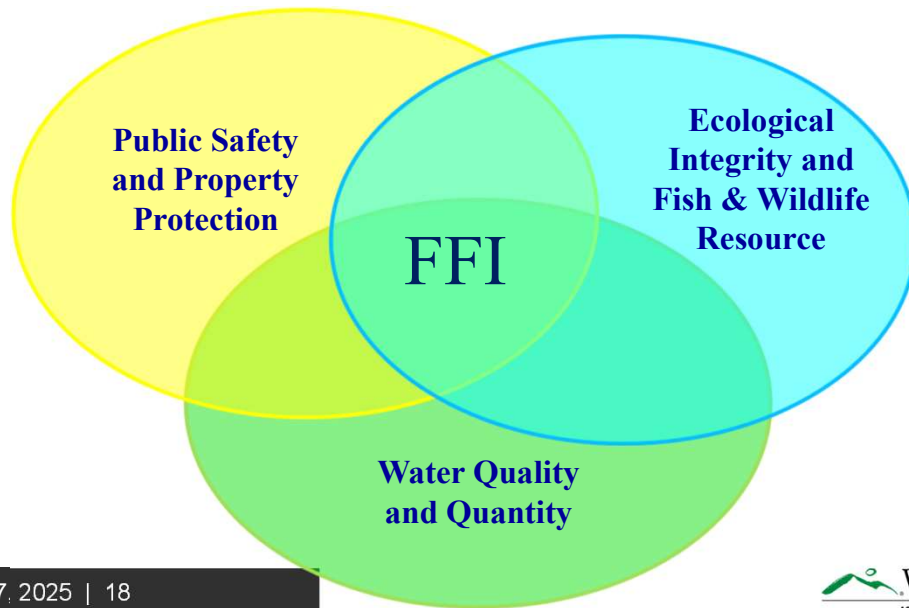
To help with planning, prioritizing, and tracking projects in the Lake Champlain Basin, the State's Rivers Program, and partners, worked to develop the Functioning Floodplain Initiative Tool.

FFI Tool – WQ, Flood Resiliency, & Habitat

The screenshot displays the FFI Tool web interface. At the top, the logo for the Functioning Floodplain Initiative (FFI) and the Vermont Department of Environmental Conservation are visible. The main navigation bar includes links for HOME, EXPLORE DATA, PROJECT PLANNING, WATERSHED REPORTING, and USER MANUAL. The central part of the interface is a map showing a river corridor with various data overlays, including floodplains and habitat areas. A sidebar on the right provides details for a selected feature, such as 'River Corridor Connectivity', 'FFI ID: 85_M01A_0_C00', and 'SGAT ID: 85_M01A'. Below the map, there are several tabs for different analysis components: PROJECT SCREENING, CALCULATION INPUTS, WATER QUALITY BENEFIT, FLOODPLAIN RESILIENCY BENEFIT, HABITAT BENEFIT, BENEFIT SUMMARY, and COST EFFECTIVENESS. At the bottom of the interface, there are buttons for EXPORT CSV, EXPAND ALL, and CLEAR RESULTS. A footer section includes the date 'February 7, 2025 | 17' and the Vermont Department of Environmental Conservation logo.

The web-based tool provides a format to calculate project benefits, such as phosphorus reduction and potential reductions in flood vulnerability,

Functioning Floodplain Initiative



February 7, 2025 | 18



By working together through the lens of the Function Floodplain Initiative we can achieve many of our goals for water quality, resiliency, and habitat.



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February 7, 2025 | 19



Thank you for your time.

Are there any questions?