Gully Brook Floodplain Restoration Project Retrospective

Project Sponsors:

- Poultney Mettowee NRCD
- Vermont DEC – Water Quality Division
- US Fish and Wildlife – Partners for Wildlife Program
- USDA-NRCS
- The Traverse Farm and Family

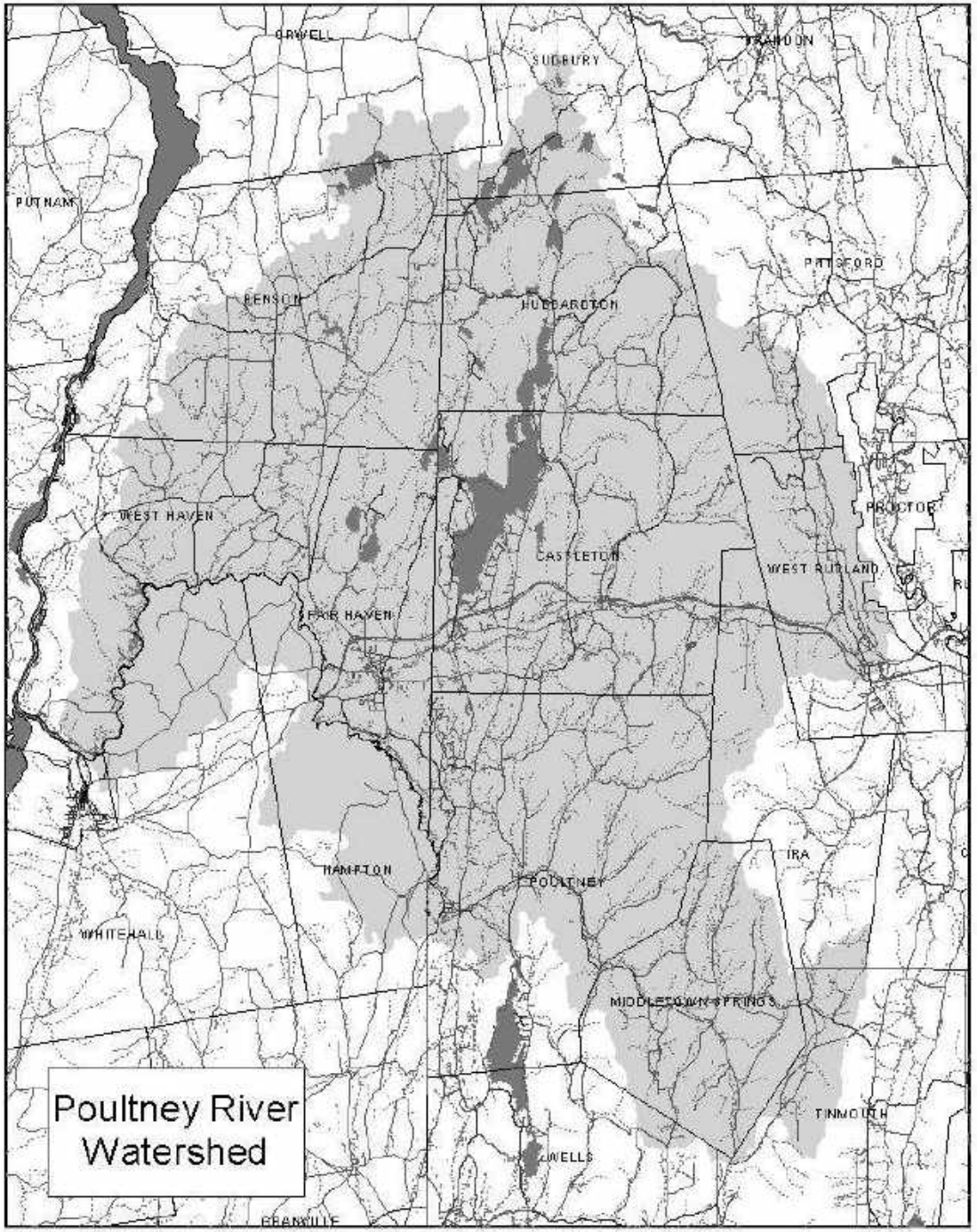
Project Funded through:

- EPA 319 Grant
- Partners for Wildlife Program (USFWS)

Poultney River drains 236 square miles in Vermont

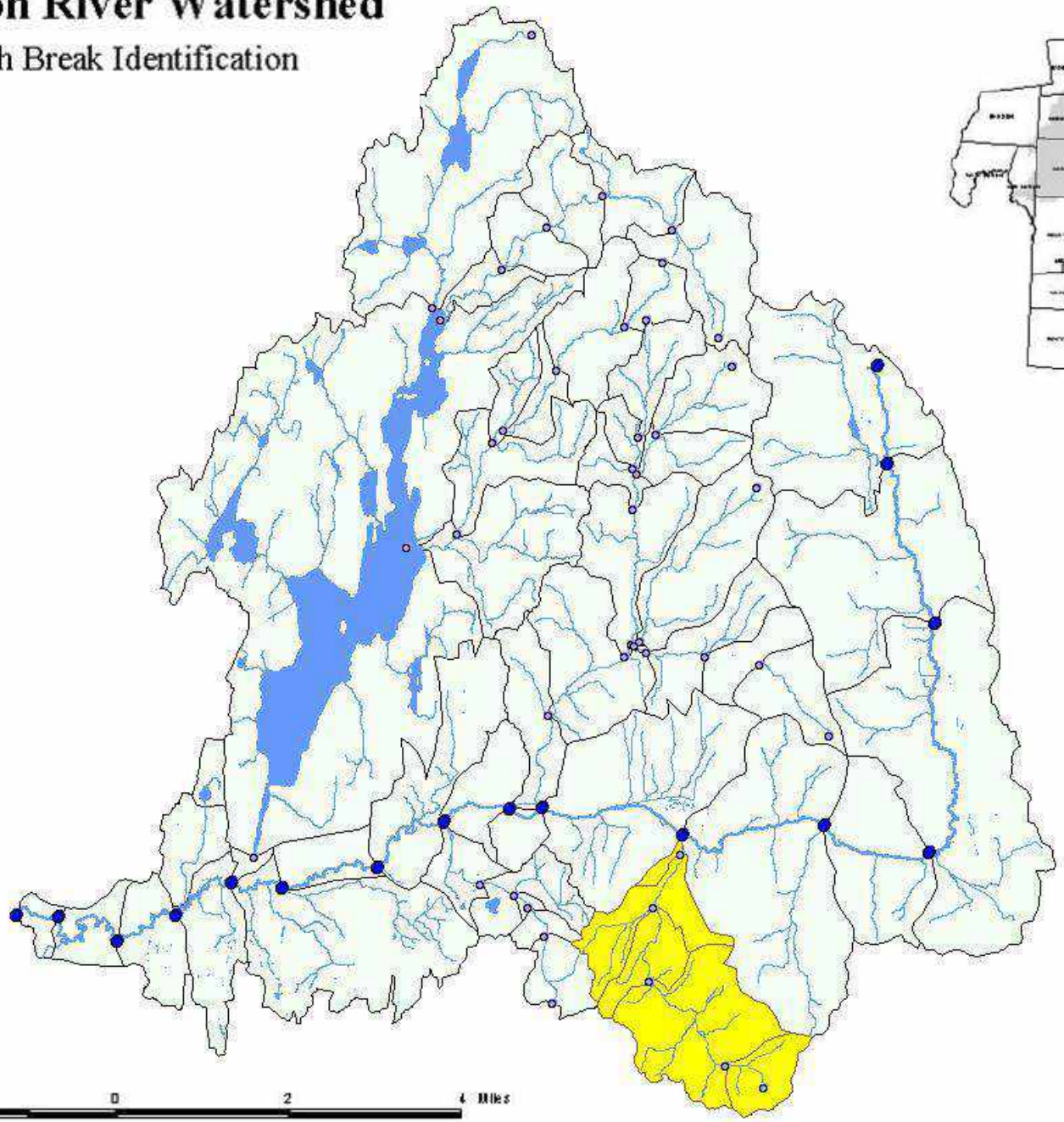
Castleton River (sub-basin) – 99 square miles - Moderately-sized mountain stream

Gully Brook – 5 square miles – small high gradient



Castleton River Watershed

Reach Break Identification



Site Plan overview –

confluence area (blue circle)

Floodplain restoration extent (red polygon)

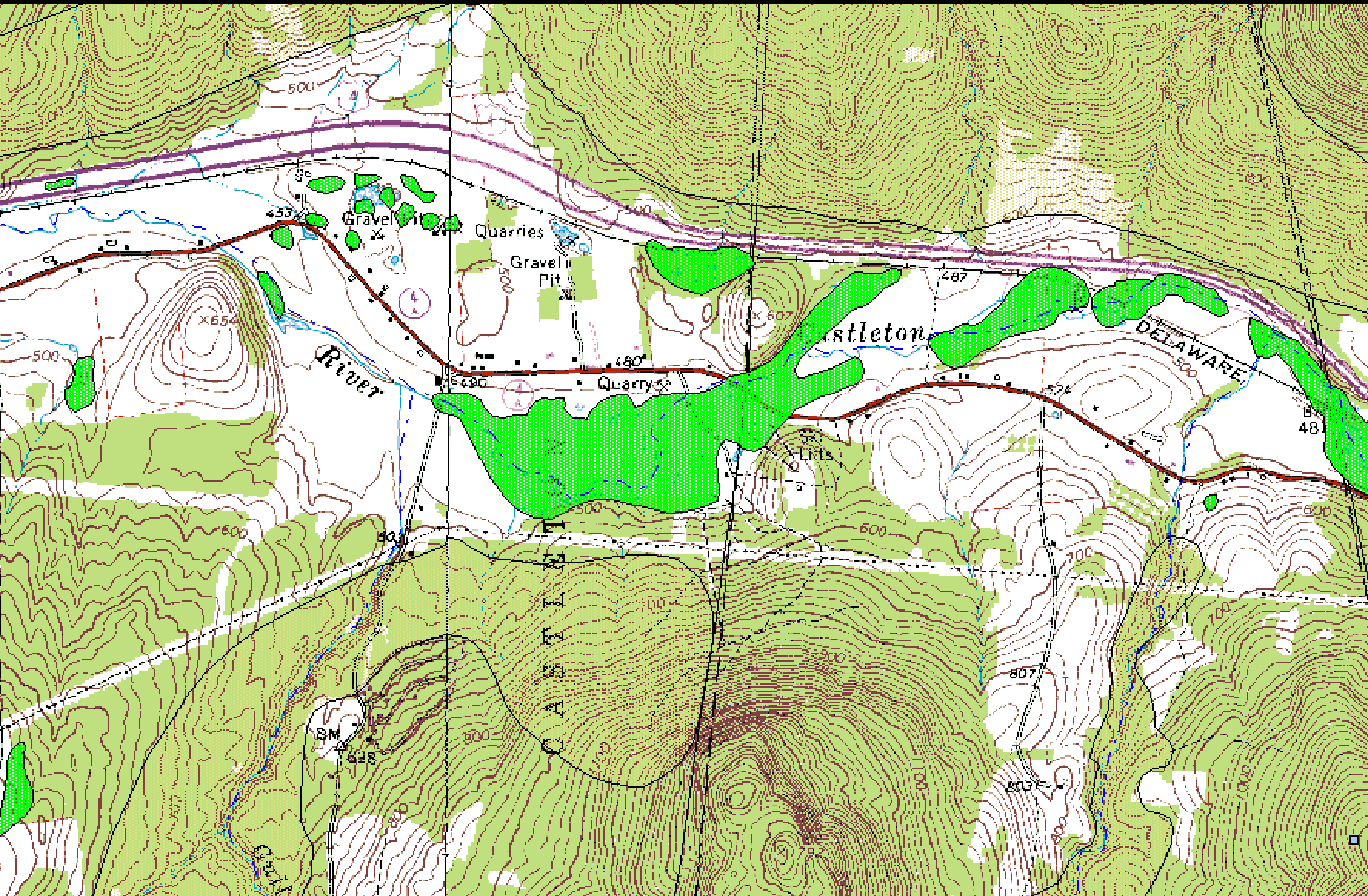

1942 Orthophoto


1962 Orthophoto


5578

Straight Channels

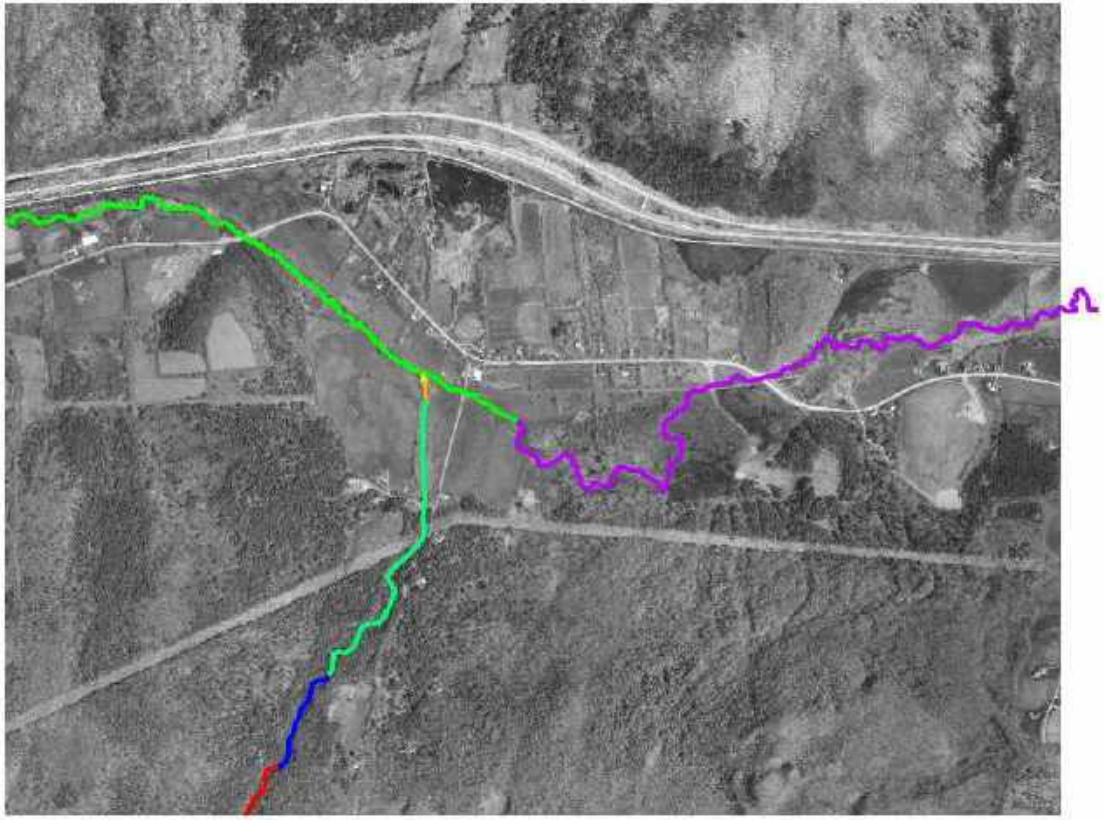
Post Flood Channelization Castleton River, Castleton, 1927



500
Gravel Pit
Quarries
Gravel Pit
453
x654
500
River
x490
480
Quarry
Castleton
487
DELAWARE
x507
Lifts
500
600
600
700
807
803
628
BM
600


Lake Traverse

Channel Morphology



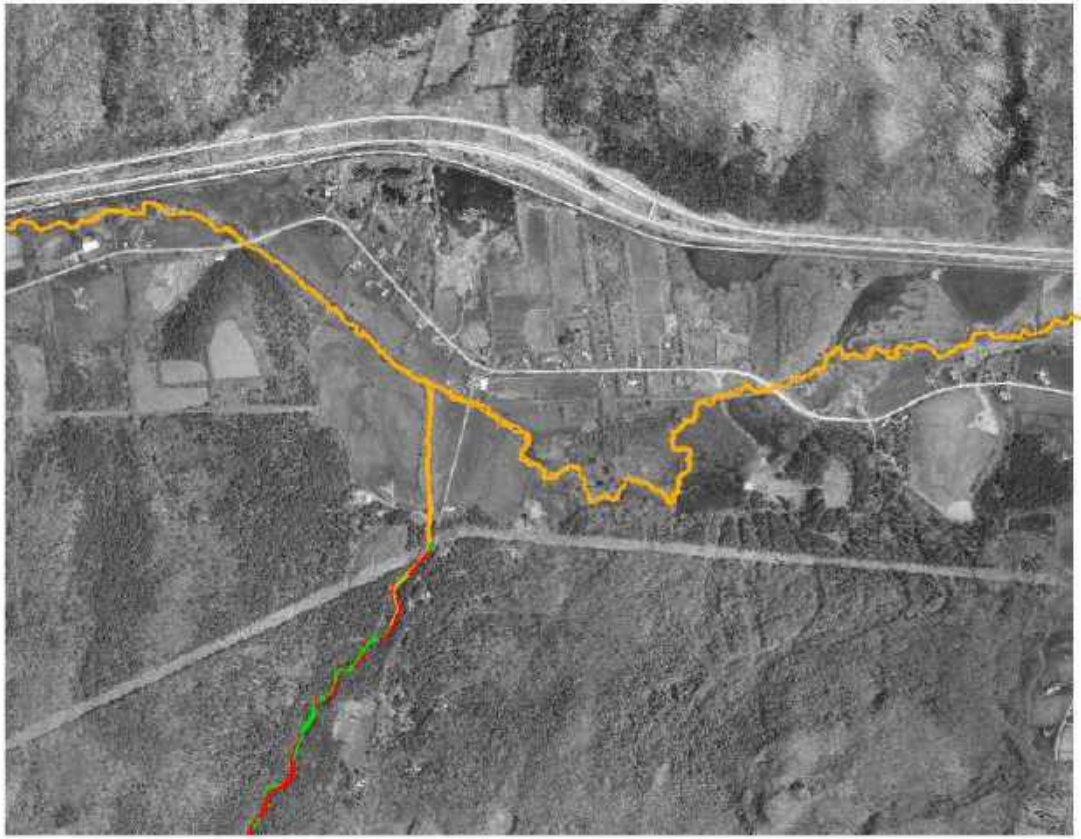
Legend

- cascade
- multi channel
- plane bed
- pool ripple
- step pool
- marsh

N
W E
S

0.5 0 0.5 1 Miles

Bank Classification



300 0 300 600 Feet

Traverse Project
Castleton, Vermont

Photo 1996


932

Gully Brook, Traverse Farm Marginal pasture converted to Flood Attenuation Area (2005)

Excavate berm and terrace for new floodplain

Mix of Passive and Active Restoration Techniques

2012 – 8 years post restoration

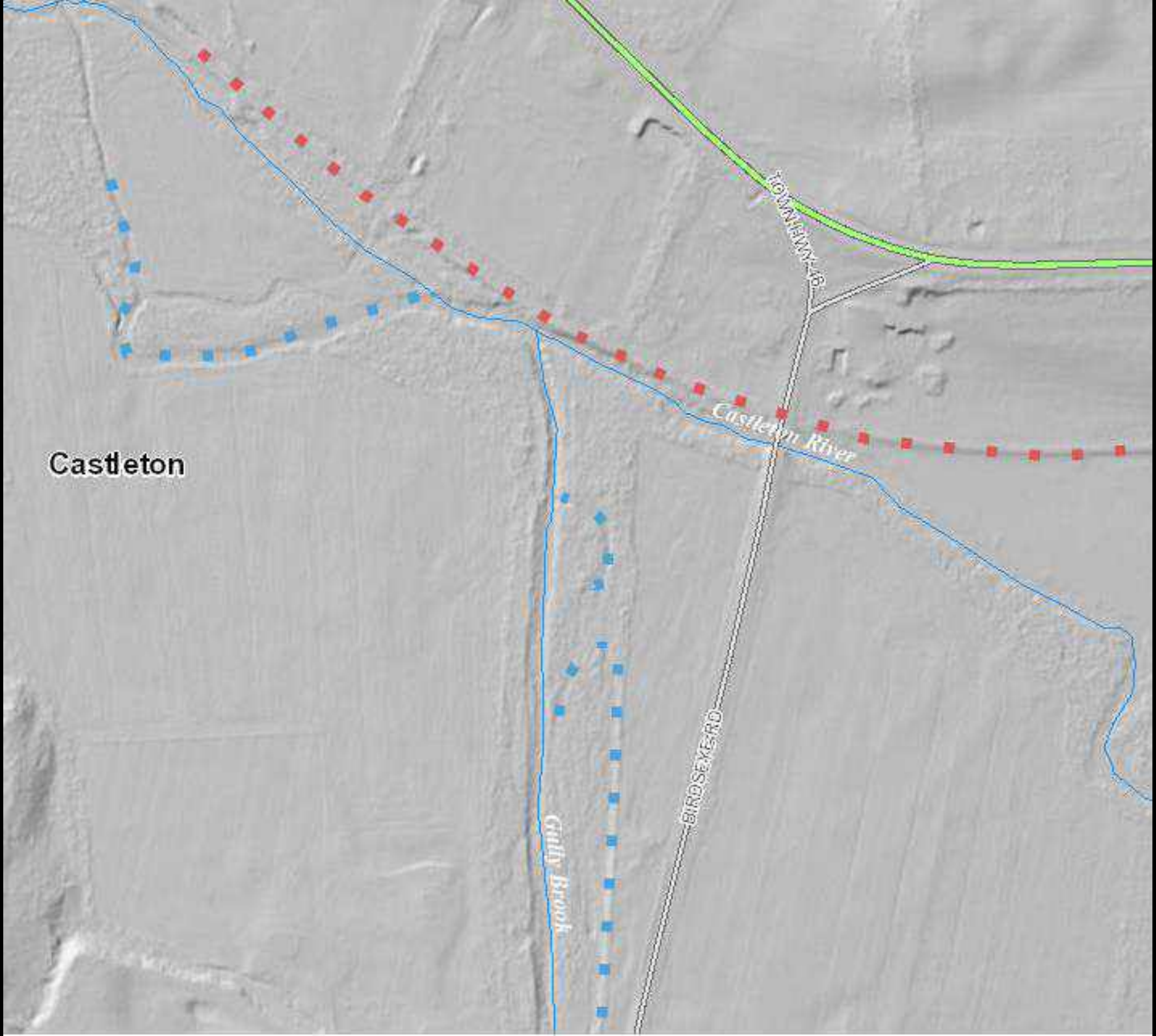
O&M Considerations

- Landowner stewardship agreements/ easement
- Channel management rights
- Encroachment prevention
- Riparian buffer plantings
- Invasive species management

- Stream geomorphic assessments – detecting morphological changes
- Biomonitoring
  - Bio-indices per stream eco-type
    - Bugs
    - Fish
- Riparian revegetation
  - Success rates
  - Replantings if needed
  - Invasive species management

Natural Regeneration


Castleton River
BIRDSEYE RD
Gully Brook
Castleton River
BIRDSEYE RD
Gully Brook
VCGI


Castleton
Castleton River
TOWNHWY 48
BIRDSEYE RD
Gully Brook

Floodplain/Stream Restoration - Implementation

Dog River Floodplain Restoration

AGENCY OF NATURAL RESOURCES

Towns: Northfield

County: Washington

Watershed: Winooski

State Funding: $242,039

Funding Source: Capital Fund

Description: The Town of Northfield acquired seven contiguous properties (~5 acres) between the Dog River and Water Street, just upstream of downtown, that were damaged during Tropical Storm Irene. The FEMA deed restrictions require that these properties be maintained as open space in perpetuity. This Dog River floodplain restoration project in Northfield will enhance the property's floodplain functions, establish a substantial vegetated buffer, and provide recreation amenities. The project is the culmination of several years of work by the Town of Northfield and the Friends of the Winooski River to examine opportunities to increase flood resiliency along the Dog River in Northfield.

Partner: Friends of the Winooski River

Before: Floodplain disconnected from Dog River due to berm

After: Restored floodplain with berm removed along Dog River in Northfield, VT

Project Status:

Funded SFY 2017

Completed SFY 2018

Results:

- 1 Acres of river corridor buffer planted or restored
- 3.1 Acres of floodplain reconnected or restored
- 1,210 Linear feet of riparian corridor buffer planted or restored
- 1.33 kg of phosphorous reduced annually, over 10 years

2019 - April flood event on the 1.3 acre floodplain restoration site in Northfield, VT (completed with FEMA/ERP funding).

After the flooding, the area and depth of sediments deposited was measured in the field and samples were tested at UVM for TP. From these measurement, it can be estimated that:

-313 tons of fine sediment deposited, and that there were 306 lbs of Total Phosphorus in deposited sediments

DEC is working with consultants to develop efficiency ratings for floodplains in the basin for sediment and nutrient storage during floods. Part of a network of sites to get empirical data to augment/validate modelling. This research will be included within the framework of our Functioning Floodplains Initiative.