

Flood Resilience & Recovery:

Actions in Vermont's Mad River Valley



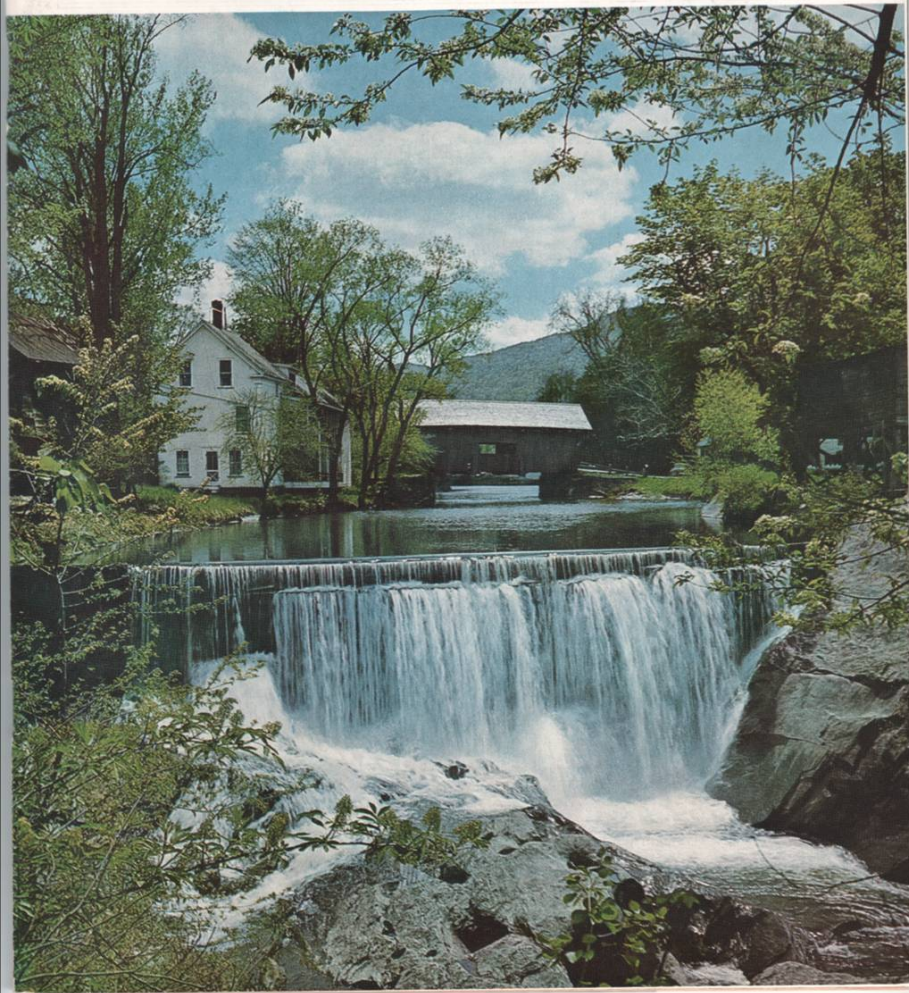
Joshua Schwartz
Executive Director
Mad River Valley Planning District



VERMONT *Life*

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SPRING 1960

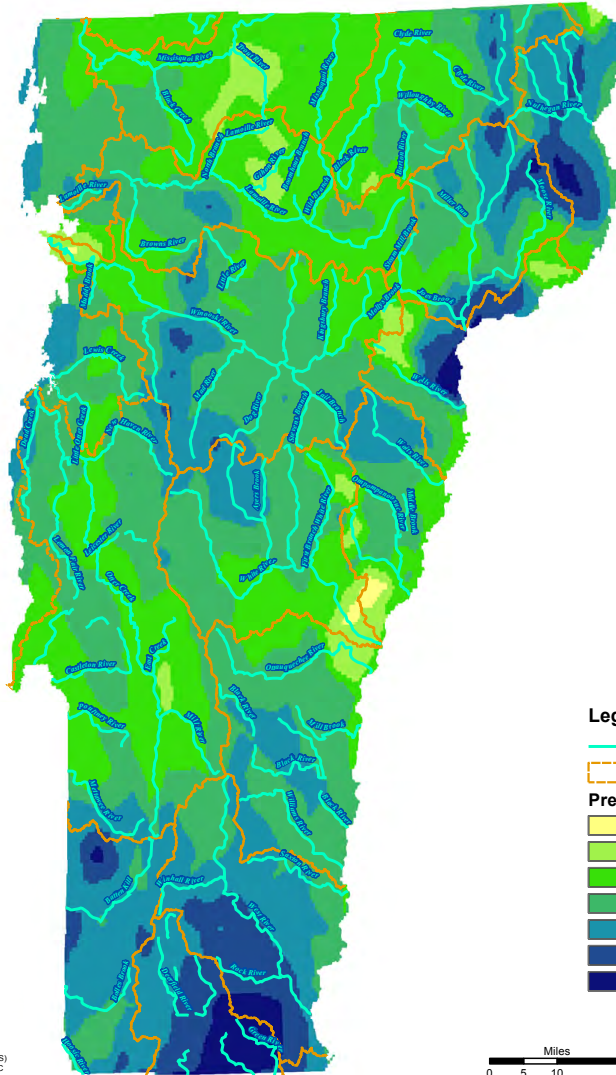






Above: about 3:30 pm. Below: water level around 530pm

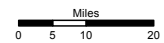
FEMA-4022-DR-VT TROPICAL STORM IRENE
Total Rainfall in Inches 27 August - 1 September 2011



Legend

- Flowlines
- HUC 8 Boundaries
- Precipitation in Inches**
 - 2.250 - 2.512
 - 2.512 - 3.316
 - 3.316 - 4.143
 - 4.143 - 4.947
 - 4.947 - 5.752
 - 5.752 - 6.579
 - 6.579 - 7.797

SOURCE - NATIONAL
WEATHER SERVICE (NWS)
ADVANCED HYDROLOGIC
PREDICTION SERVICE
GRIDDED RAINFALL DATA









Exploring pathways to transformations in post-disaster-event communities

A case study on the Mad River Valley, Vermont, USA



Vermont Downtown Action Team Report
August 1, 2014

**Waitsfield,
Vermont**

Hill Farming in the Mad River Valley

A 2013 Research Project for the Mad River Valley Planning District



Disaster Recovery and Long-Term Resilience Planning in Vermont
U.S. EPA Smart Growth Implementation Assistance Project
Policy Memo for the Mad River Valley
August 2013

ey
r Valley's hill farms. This
produced by Meg
the state of Vermont



Credits: (Top) Richard Amore, Courtesy of the State of Vermont; (Bottom) Lars Gange & Mansfield Heiflight.

Caption (Clockwise from Top Left): Downtown Waitsfield, Vermont; Moretown Town Hall; Flood damage in Waitsfield, Vermont from Tropical Storm Irene.

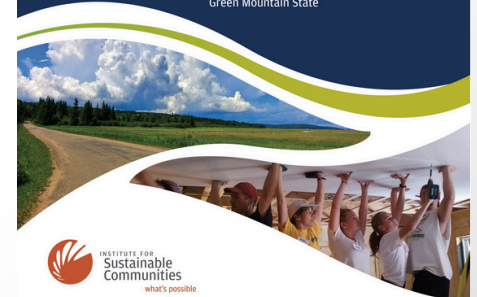


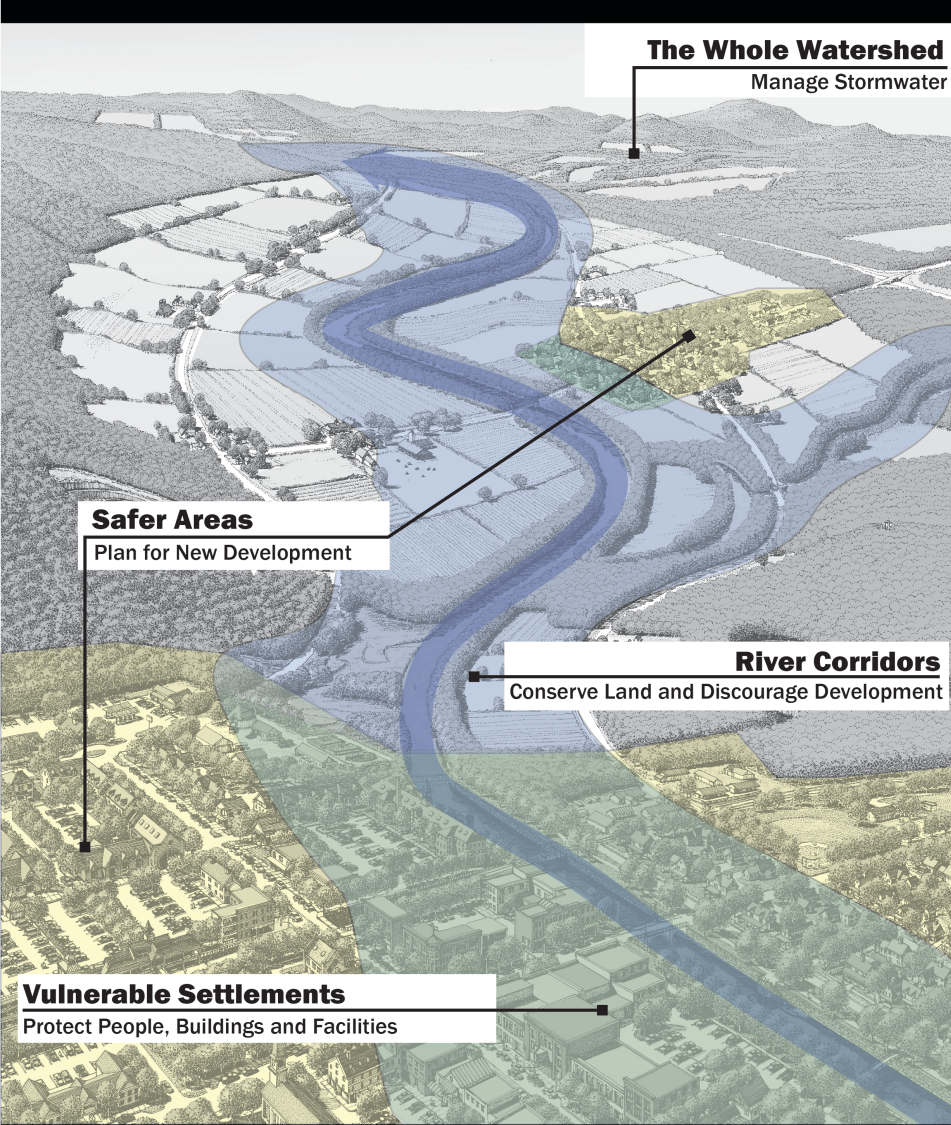
Vermont Downtown Action Team Report
August 1, 2014

**Warren,
Vermont**

VERMONT'S ROADMAP TO RESILIENCE

Preparing for Natural Disasters and the
Effects of Climate Change in the
Green Mountain State





The Whole Watershed

Manage Stormwater

Safer Areas

Plan for New Development

River Corridors

Conserve Land and Discourage Development

Vulnerable Settlements

Protect People, Buildings and Facilities

Planning for Flood Recovery & Long-Term Resilience in Vermont: Smart Growth Approaches for Disaster-Resilient Communities

www.epa.gov/smartgrowth

FLOOD RESILIENCE CHECKLIST

Overall Strategies to Enhance Flood Resilience

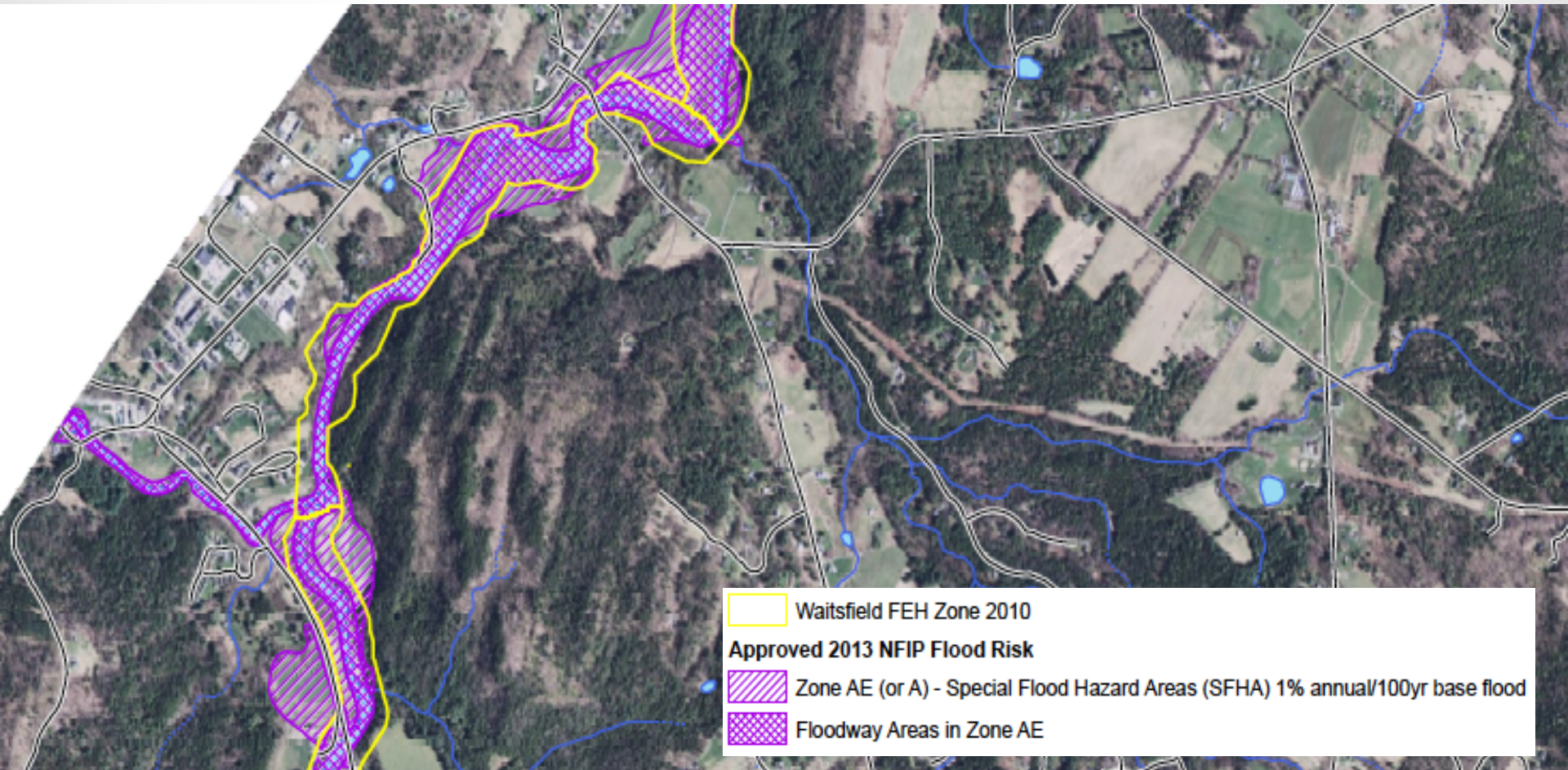
(Learn more in Section 2, pp. 9-11 of

[Planning for Flood Recovery and Long-Term Resilience in Vermont](#))

1. Does the community's comprehensive plan have a hazard element or flood planning section? April 2011 Town Plan (pre-Irene)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
a. Does the comprehensive plan cross-reference the local Hazard Mitigation Plan and any disaster recovery plans?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
b. Does the comprehensive plan identify flood- and erosion-prone areas, including river corridor and fluvial erosion hazard areas, if applicable? FEH suggested but no map included.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Did the local government emergency response personnel, flood plain manager, and department of public works participate in developing/updating the comprehensive plan?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
2. Does the community have a local Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) and the state emergency management agency? Updated 2013	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
a. Does the Hazard Mitigation Plan cross-reference the local comprehensive plan?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b. Was the local government planner or zoning administrator involved in developing/updating the Hazard Mitigation Plan?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Were groups such as local businesses, schools, hospitals/medical facilities, agricultural landowners, and others who could be affected by floods involved in the Hazard Mitigation Plan drafting process?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
d. Were other local governments in the watershed involved to coordinate responses and strategies?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
e. Does the Hazard Mitigation Plan emphasize non-structural pre-disaster mitigation measures such as acquiring flood-prone lands and adopting No Adverse Impact flood plain regulations?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
f. Does the Hazard Mitigation Plan encourage using green infrastructure techniques to help prevent flooding?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
g. Does the Hazard Mitigation Plan identify projects that could be included in pre-disaster grant applications and does it expedite the application process for post-disaster Hazard Mitigation Grant Program acquisitions?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
3. Do other community plans (e.g., open space or parks plans) require or encourage green infrastructure techniques? NA. No relevant plans.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

River Corridors:

Conserve Land & Discourage Development



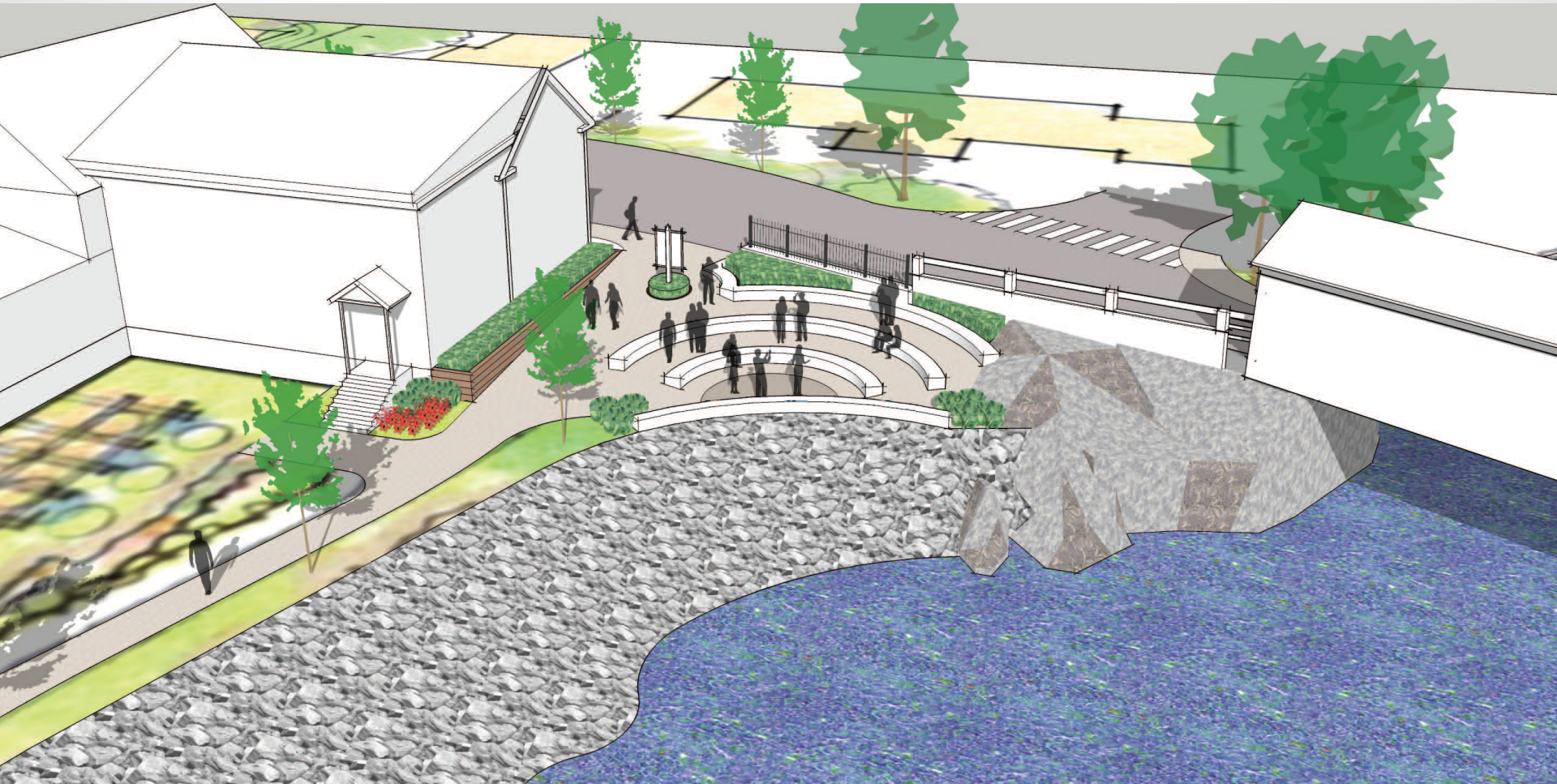
Vulnerable Settlements:

Protect People, Buildings & Facilities

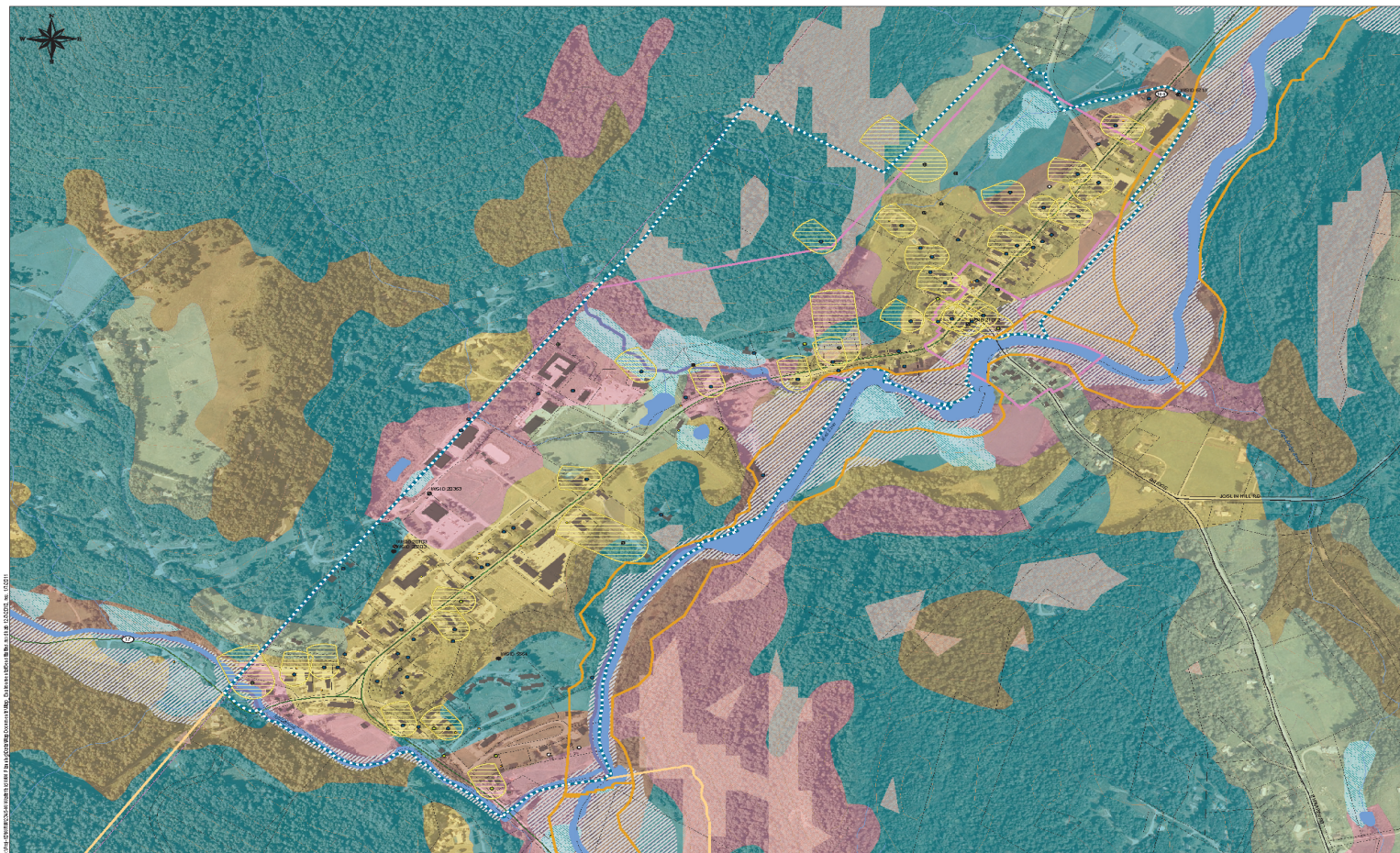


Vulnerable Settlements:

Protect People, Buildings & Facilities



Safer Areas: Plan for New Development



**Figure 3
Environmental Sensitivities**

**Decentralized Wastewater
Treatment Options**
Waitsfield Village and Irasville, Vermont

- Study Area
- Fluvial Erosion Hazard
- Zoning Districts (2010)**
 - Village Commercial
 - Village Residential
 - Irasville Village
 - Commercial Lodging District
- Underground Storage Sites
 - Hazardous Sites
- Water Supply Wells**
 - Drilled
 - Drilled shared
 - Drilled - non potable
 - Dug Well or Spring
 - Public Water Supply Well
- 50 ft Contour
- Building
- Status**
 - Well Shield
 - Parcel Boundary
 - Slope > 30%
 - FEMA 100-Year Flood Zone
 - Wetlands
- Onsite System Suitability**
 - Conventional Subsurface
 - Conventional, Excessive Slope/Permeability
 - At-grade or Filtrate + Conventional
 - Mound or Filtrate + At-grade
 - Mound w/Curtain Drain or Filtrate + Mound
 - Filtrate + Mound w/Curtain Drain
 - Performance Based System or Not Suited
 - Not Ranked

Sources: VCGI: Streams, Water Bodies, Soils (NRCS), 50 ft contours, Structures, Underground Storage Sites, Hazardous Sites, Flood Zones (FEMA), VT AHR Wetlands, Town of Waitsfield: Parcel Boundaries, Zoning Districts, Stone: Onsite System Suitability Classification, Phelps and Stone: Well Shields, Water Supply Wells, Buildings, Central Vermont Regional Planning Commission (CVRPC) Fluvial Erosion Hazard

Note: Well shields are the "future case" after the water project is completed, based on municipal water connection status as of November 19, 2015.

0 250 500 1,000
Feet

Vulnerable Settlements: Protect People, Buildings & Facilities



Master Development Plan for the Irasville Growth Center *A Vision for a New Village*

Prepared for:
The Town of Waitsfield, Vermont
and the
Mad River Valley Planning District

September 2002



Prepared by:
Lamoureux and Dickinson Consulting Engineers, Inc.
Essex Junction, Vermont

The Office of Robert A. White, ASLA
Norwich, Vermont

The Whole Watershed:

Manage Stormwater (*Slow it, Spread it, Sink it*)



The Whole Watershed:

Manage Stormwater (*Slow it, Spread it, Sink it*)





RESILIENCE

THANK YOU

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