

Town of Dummerston Local Hazard Mitigation Plan



The West River During Tropical Storm Irene



FEMA Approval Pending Adoption Date:
Town Adoption Date:
FEMA Final Approval Date:

**THIS DRAFT DOCUMENT IS OPEN FOR PUBLIC COMMENT UNTIL
March 20, 2024. Comments can be provided to
asabetto@windhamregional.org or 802-257-4547 ext. 113.**

**Technical Assistance for the Plan development provided by the
Windham Regional Commission**



In cooperation with

**Vermont Emergency Management and the
Federal Emergency Management Agency**



FEMA

Certificate of Adoption
Town of Dummerston, VT

A Resolution Adopting the
Town of Dummerston Local Hazard Mitigation Plan

WHEREAS, the Town of Dummerston, VT has worked with the Windham Regional Commission to identify natural hazards, analyze past and potential future damages due to natural disasters, and identify strategies for mitigating future damages; and

WHEREAS, The *Town of Dummerston Local Hazard Mitigation Plan* analyzes natural hazards and assesses risks within the community; and

WHEREAS, the *Town of Dummerston Local Hazard Mitigation Plan* recommends the implementation of action(s) specific to the community to mitigate against damage from natural hazard events; and

WHEREAS, the Town of Dummerston authorizes responsible agencies to execute their responsibilities to implement this plan for the purposes of long-term risk reduction and increased community resiliency and;

WHEREAS, the Town of Dummerston, VT will follow the Plan Maintenance Process outlined in herein to assure that the *Town of Dummerston Local Hazard Mitigation Plan* stays up to date and compliant; and

NOW, THEREFORE BE IT RESOLVED that the Town of Dummerston adopts the *Town of Dummerston Local Hazard Mitigation Plan*. While content related to the Town of Dummerston may require revisions to meet the plan approval, changes occurring after adoption will not require the Town of Dummerston to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this _____ day of _____, _____.
month, year

Selectboard

ATTEST

Contents

Contents.....	1
INTRODUCTION AND PURPOSE	1
WINDHAM REGION GEOGRAPHY	1
COMMUNITY PROFILE	2
Geography and Land Use	2
Development and Population Trends	2
Emergency Services and Resources	4
Public Water and Sanitary Sewer Infrastructure	5
Transportation Infrastructure and Act 64.....	5
Communication Coverage	5
PLANNING PROCESS	5
Plan Developers.....	6
Update Process	6
Data Sources.....	8
HAZARD IDENTIFICATION AND RISK ASSESSMENT	1
Community Assets	1
VTrans Transportation Infrastructure Vulnerability Mapping	2
Federal Disaster Declarations for Windham County	5
Severe Storms, Flooding, Landslides, and Mudslides	5
Climate Trends.....	6
Power Outage Statistics	7
Hazard Ranking Process	7
Highest Risk Hazard Profiles.....	9
High Winds	9
Wind Hazard Summary Table.....	13
Fluvial Erosion and Inundation Flooding	13
Structures in Mapped Flood Hazard Areas	17
Flood Hazard Summary Table.....	19
Ice, Snow, and Extreme Cold	19
Ice, Snow, and Extreme Cold Summary Table	20
Invasive Species: Plants and Insects.....	29
Invasive Species Summary Table.....	35
Heat	36
Heat Summary Table	37
Drought	37
Drought Summary Table	38
Infectious Disease Outbreak.....	39

Infectious Disease Summary Table	39
Landslide.....	40
Landslide Summary Table	41
Mitigation Strategy	41
Goals of Mitigation.....	41
Community Capabilities.....	42
NFIP Compliance.....	44
State Incentives for Flood Mitigation	45
Identification of Mitigation Actions	45
Mitigation Action Evaluation.....	51
Crosby Brook Stream Corridor Restoration Plan Actions	55
Incorporating Mitigation into Other Local Planning Mechanisms	56
PLAN MAINTENANCE PROCESS	59
Yearly Review and Plan Monitoring	59
Five-Year Update Process	59
Post-Disaster Review/Update Procedure.....	60
Ongoing Public Participation	60
APPENDIX	62

INTRODUCTION AND PURPOSE

The impact of expected, but unpredictable natural events can be reduced through community planning and action. The goal of this Plan is to provide a natural hazards local mitigation strategy that makes Dummerston (the Town) more disaster resistant and more resilient after a disaster.

Hazard mitigation is any sustained action that reduces or eliminates risk to people and property from natural hazards and their effects. Based on the results of previous project impact studies, FEMA and state agencies have come to recognize that it is more cost effective to prevent damage from disasters than to repeatedly repair damage after a disaster has struck. This Plan recognizes that communities also have opportunities to identify mitigation strategies and measures during all phases of emergency management – prevention, preparedness, response and recovery. Hazards cannot be eliminated, but it is possible to understand the potential of hazards and the risk facing the community, and to identify what local actions can be taken to reduce the severity of hazard-related damage.

The purpose of this Plan is to assist the Town in identifying all natural hazards facing the community, ranking them according to local vulnerabilities, and developing strategies to reduce risks from those hazards. Once adopted, this Plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property.

The benefits of mitigation planning include:

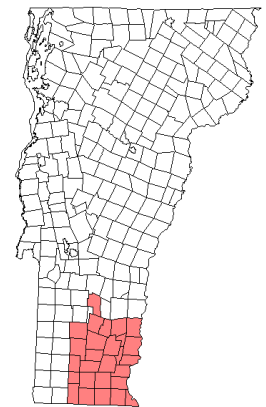
- Identifying actions for risk reduction that are agreed upon by stakeholders and the public.
- Focusing resources on the greatest risks and vulnerabilities.
- Increasing education and awareness of threats and hazards, as well as their risks.
- Reducing the degree of injury and inconvenience to the townspeople and their private and municipal property.
- Communicating priorities to State and Federal officials.
- Aligning risk reduction with other community objectives.

Adoption and maintenance of this Hazard Mitigation Plan will:

- Make certain funding sources available to complete the identified mitigation initiatives that would not otherwise be available if the plan were not in place;
- Support effective pre- and post-disaster decision making efforts;
- Lessen each local government's vulnerability to disasters by focusing limited financial resources to specifically identified initiatives whose importance have been ranked; and
- Connect hazard mitigation planning to community planning where possible.

WINDHAM REGION GEOGRAPHY

Situated in Vermont's southeastern corner, the Windham Region consists of 23 towns in Windham County, the neighboring towns of Readsboro, Searsburg, and Winhall in Bennington County, and Weston in Windsor County. The region is bordered by Massachusetts to the south and New Hampshire to the east. At over 920 square miles (590,000 acres), the region accounts for roughly 9.6% of the State's total land area. The Windham Region has several distinctive identities, largely defined by the diverse natural environment.

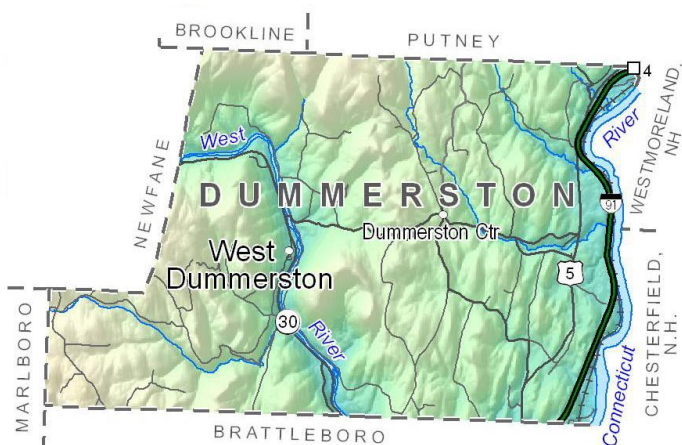


The Region's topography is relatively flat or gently rolling land in the Connecticut River valley in the east, while the western part of the region is characterized by the Green Mountain ridges and peaks with narrow stream valleys. Stratton Mountain is the highest point in the region at 3,936 feet. The lowest point is along the Connecticut River in Vernon, at 200 feet.

In addition to the Connecticut, other major rivers of the region are the Deerfield, Green, North, Saxtons, West, and Williams, all tributaries of the Connecticut. There are two major flood control reservoirs on the West River, Ball Mountain and Townshend, and two major storage reservoirs for hydropower generation on the Deerfield River, Somerset and Harriman.

COMMUNITY PROFILE

Geography and Land Use



The Town of Dummerston is a rural Southern Vermont hill town of 19,815 acres or 31 square miles in the eastern foothills of the Green Mountains in Windham County. Dummerston is bordered to the north by Brookline and Putney, to the west by Newfane and Marlboro, to the south by Brattleboro and to the east by the Connecticut River and Westmoreland, NH and Chesterfield, NH. State Route 91 runs north south through Dummerston on the eastern edge, Route 5 runs just west of 91 and Route 30 goes through Dummerston along the West River corridor.

The physical characteristics of Dummerston are dominated by two rivers: the Connecticut River and the West River. The West River serves to divide Dummerston and West Dummerston which lies just

west of the river. The West River flows south to join with the Connecticut River in Brattleboro. There are only two crossings over the West River in Dummerston, both of which are one lane bridges. The iron bridge cannot accommodate large vehicles, such as fire trucks or school buses. If something were to happen to the covered bridge to make unusable, all vehicles would have to go south on either Route 30 or Route 5 in Brattleboro, and back north to reach either side of the town. This would cause a significant delay in response time.

The topography of Dummerston is varied, being relatively flat in the Connecticut River Valley and quite hilly elsewhere in town. Black Mountain, at 382 meters or 1253 feet, is a dominant landmark located between the river valleys in the southern part of Town. Other prominent high points include Prospect Hill, Dummerston Hill, and Wickopee Hill¹¹. The majority of the landscape of Dummerston is forested, with compact settlements interspersed throughout the landscape chiefly in West Dummerston, Dummerston Center, and Slab Hollow. Elsewhere homes and commercial establishments are located along rural routes in a linear pattern. Woodlands are predominant in Dummerston and cover a vast acreage of land. These forestlands provide the scenic backdrop for the town and provide wood products, wildlife, maple products and recreation. Most forestland is private, non-industrial ownership. Approximately 6,600 acres are actively managed under the Vermont Current Use Value Appraisal Program.

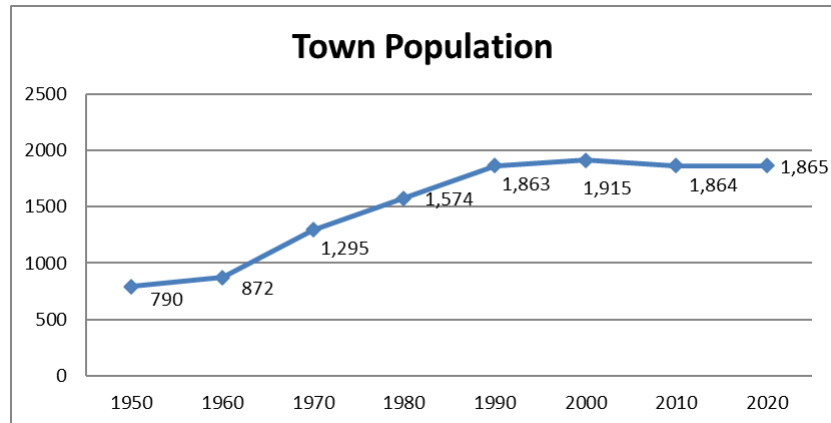
The climate is generally temperate with moderately cool summers and cold winters, as in the rest of Vermont. The weather is unpredictable, and large variations in temperature, precipitation, and other conditions may occur both within and between seasons.

Development and Population Trends

As the following table shows, population in Dummerston has generally increased between 1950-1980, and has held steady since 1990. Dummerston has seen virtually no population change since the last Plan update.

¹¹ Dummerston 2014 Town Plan

This consistency has meant no change to vulnerability level since the last Plan. The Census Bureau has risk factors that increase vulnerability and provided that data at a county level. For Windham County that data shows that 13.1% of the population is below poverty, 27.4% has some type of disability, 5.9% are without a vehicle, and only 71.9% have broadband². For Dummerston, 13.4% of the population is in poverty, 17.2% are disabled, 5.9% are without a vehicle, and broadband statistics were not given at the town level. These statistics show that Dummerston compares similarly in vulnerability to other towns in Windham County.³



There is a significant aging population in Dummerston that the townspeople recognize and work to support. There is also a sector of the Dummerston population that is quite self-sufficient. There is another sector of the town's changing population that expects services that aren't always available in a small town. The Scott Farm and the Dummerston Apple Festival bring tourists to Dummerston. So, there are a wide variety of people in Dummerston, and each has their own set of needs and vulnerabilities.

The development pattern has not changed appreciably over the years or since the last Plan. Development trends noted by the Town are that more residents work from home than in prior years, and there are more home-based businesses. Residential development has been spreading into previously undeveloped areas located further off town roads. The densest concentration of residences can be found in West Dummerston, Dummerston Center, Slab Hollow-East Dummerston, Little Connecticut (upper Hague Road), and along Houghton Brook Road near the Putney border. There are a lot of people that have lived in town for many years and have land that has been passed down for generations. The land use pattern is predominantly single-family homes spread out into rural areas⁴. There are varying views of new development in town, which promotes healthy discussion when new development is proposed.

The Zoning Administrator provided statistics on the number of permits issued yearly since the last Plan update and that is shown below. Dummerston added Short Term Rentals as a Conditional Use (CU) in their Zoning in 2018 which has boosted CU permits by 3 to 5 per year. The ZA noted that the number of subdivisions is up (discounting the economic downturn in the past year). There has been growth in Accessory Dwelling Use permits as residents are housing aging parents, both in home additions and free-standing units. Overall, no development patterns have altered the vulnerability of the built environment to any measurable extent since the last Plan update.

² US Census Bureau, My Community Explorer tool, ACS 2017-2021: Windham County, Vermont statistics.

³ US Census Bureau, American Community Survey 5-Year Estimates 2017-2021.

⁴ 2018 Dummerston Town Plan, page 16.

Dummerston Zoning Permit Statistics

Date	Permits	Subdivisions	ADUs	Conditional Uses	Column1
2016	40	7	0	8	
2017	30	4	2	4	
2018	41	4	1	13	
2019	57	3	2	12	
2020	29	4	2	13	
2021	38	7	3	7	
2022	34	8	2	13	
2023	26	3	1	11	

Notes: Fiscal years ending June 30th.

Short Term Rental added as CU in 2018. This has boosted CU permits by 3 to 5 per year.

Commercial development is, for the most part, scattered along Route 5 and Route 30. There is some industrial development in the northeast corner of town, on Kathan Meadow Road, in the Connecticut River floodplain, and in the southeast corner of town, on Old Ferry Road. There is not a lot of growth in commercial development in Dummerston. There are numerous of home-based businesses, artisans, and creative individuals in town. A lot of people commute to the Brattleboro and Massachusetts or New Hampshire regional towns for work. Unless you're working for yourself, it can be difficult to get a job without working elsewhere out of the town.

Overall, while there have not been appreciable changes in Dummerston since the last Plan update, change has occurred in that the older/higher risk population has expanded with age, and the impacts and weather patterns linked to climate change have become more evident.

Emergency Services and Resources

Dummerston is served by the West Dummerston Volunteer Fire Department (WDVFD), a private, non-profit organization that formed in 1949 and operates solely through contributions of time and money. There are two fire stations, one in West Dummerston and one in Dummerston Center. The Department serves the entire town and has mutual aid agreements with surrounding towns. There are currently 22 active member volunteers that run the WDVFD. Given the constraints imposed by this type of support it has neither financial nor the human resources to provide the level of fire protection that would be required by large-scale development. As with many small-town fire departments in Vermont, there is a lack of younger volunteer firefighters. WDVFD aims to be the first to arrive on the scene in emergencies: medical calls and motor vehicle accidents comprise the vast majority of responses. WDVFD is a member of Windham County Firefighters, and is dispatched by Southwestern New Hampshire Mutual Aid. WDVFD is operated by a Board of Trustees, as well as the Fire Chief, and Deputy Fire Chief, and officers. WDVFC makes all efforts to recruit volunteer fire-fighting personnel to protect Dummerston residents. Members attend training courses sponsored by Vermont Fire Academy and the various mutual aid associations. The WDVFD operates out of the West Dummerston fire station on West Street in West Dummerston, and the Dummerston substation on East West Road in Dummerston Center.

Police protection is provided by the Vermont State Police and the police departments of surrounding towns. The Windham County Sheriff's Department is contracted to provide services on a part-time basis.

An emergency management team with a director appointed by the Selectboard coordinates emergency preparedness and response for the Town. The primary method of emergency notification is two-way radios and Vermont Alert. An Emergency Operations Center, located in the Town Office and served by a backup generator, is the command center for town officials and emergency operations staff. Backup generators are also available at West Dummerston Fire Department and Dummerston School if there is a need to shelter residents.

The Dummerston Congregational Church and the Dummerston Elementary School are the two designated emergency shelters in Dummerston. For EMS, Rescue Inc. of Brattleboro and Townshend serves the town. Additional ambulances and rescue vehicles are available through Mutual Aid Dispatch. The nearest hospital to Dummerston is the Brattleboro Memorial Hospital in Brattleboro, Grace Cottage in Townshend, and Dartmouth-Hitchcock Medical Center in Keene, NH, (Cheshire Medical Center) and Lebanon, NH.

Public Water and Sanitary Sewer Infrastructure

There are no municipal water or wastewater systems in Dummerston.

Transportation Infrastructure and Act 64

State Routes 30 and 5 are the main roads serving the community. Dummerston is served by I-91 both at the south and north ends of town (Exit 3 in Brattleboro and Exit 4, which is partly in Dummerston and partly in Putney). Dummerston is located only a few miles north of Route 9, the major east-west corridor linking Brattleboro with Bennington and Keene, New Hampshire. The East-West Road from Route 30 to Route 5 is also an important road used by both local and regional commuters.

There are 646 town owned culverts in Dummerston, of which 20 are in poor condition, 4 are in critical condition and 14 are in unknown condition. There are 11 town owned bridges, 5 short and 6 long.

There are approximately 16 miles of state highway, 12 miles of Class 2 town roads, 50 miles of Class 3 town roads, and 3 miles of Class 4 roads in Dummerston. Approximately 33.8 miles or 53.9% of total town road miles (excluding class 4) are hydrologically connected, which means the road is within 100 feet of a water resource (i.e., perennial/intermittent streams, wetlands, lakes or pond). Proximity to water resources can make these sections of road more vulnerable to flooding and fluvial erosion.

Act 64, the Vermont Clean Water Act, requires the state to develop a new Municipal Roads General Permit (MRGP). The MRGP requires Dummerston to conduct Road Erosion Inventories (REIs) for hydrologically connected municipal road segments. The ANR Natural Resources Atlas shows hundreds of road segments in the town that will be included in this regulation. Dummerston will also be required to develop Road Stormwater Management Plans for all hydrologically connected road segments not meeting MRGP standards. Dummerston would then be required to implement the Road Stormwater Management Plans over time, reaching full compliance by 2035. Road improvements, which generally consist of gravel resurfacing and stone-lined ditching, also can make the roads more resilient in conveying excess water. Roads that were brought up to standard generally fared well in the most recent flood. Ongoing compliance with MGRP will improve the flood resilience of our roads, which are most likely to be damaged in flooding.

Communication Coverage

Access to high-speed internet and cell service coverage are important parts of emergency communication capabilities in a town. The Windham Region, as in many rural areas, has a patchwork of coverage levels with some areas not having coverage. In Dummerston, Fairpoint Communications provides landline phone service as well as high-speed internet in some areas. High-speed internet and voice-over-internet phone service is also offered by cable companies. However, there are still residences in Dummerston that do not have access to high-speed internet service. The town library offers a wireless internet hotspot at the community center. Cell phone coverage fluctuates throughout Dummerston, with some areas getting better reception and some getting none.

PLANNING PROCESS

Plan Developers

Each core Planning Team member serves the community in a number of capacities, creating a balanced perspective:

- Zeke Goodband, Selectboard Chair (at the time of plan development)
- Terry Chapman, Selectboard (at the time of plan development)
- Maria Glabach, Selectboard (at the time of plan development)
- David Baxendale, Selectboard (at the time of plan development)
- Martin Forrett, Co-Emergency Management Director
- Lewis White, Co-Emergency Management Director
- Laurie Frechette, Dummerston Town Clerk
- Leon Chamberlain, Road Foreman
- Roger Jasaitis, Zoning and Floodplain Administrator
- Larry Pratt, Jr., Dummerston Fire Chief
- Paul Dery, Dummerston Fire Department Treasurer

Alyssa Sabetto, Senior Planner with the Windham Regional Commission, assisted the Town with this update to meet the standards and guidelines of the latest FEMA *Local Mitigation Plan Review Tool*. FEMA Pre-Disaster Mitigation funding supported this process.

Update Process

This Local Hazard Mitigation Plan ('LHMP' or 'Plan') is an update to a Plan approved for the Town of Dummerston by the Federal Emergency Management Agency (FEMA) effective 12/22/2017 and expired on 12/21/2022. The below table lists the stakeholders that were provided an opportunity for engagement in this Plan update and how that opportunity was provided:

Stakeholder involvement	In addition to the above listed Planning Team stakeholders, the team recommended speaking with the Conservation Commission to get their input into this update. The Dummerston Conservation Commission was heavily involved with the 2017 Hazard Mitigation Plan. Alyssa met with the Chair in January 2024 to gather input on local impacts and plan actions related to invasive species.
General public involvement	An online survey was conducted for several weeks in November and December 2022 to gather input on lived experience of natural hazards in Dummerston and ideas for mitigation actions that the town could consider. Survey results are contained in this plan. Advertisement of the survey and public meetings was posted on the town website, the WRC website and went out in the electronic town newsletter which has a wide audience. Two public meetings were held.
Businesses, academia, and other private and non-profit interests	The draft plan was provided to the following entities for their review and comment via email (see appendix): <ul style="list-style-type: none">• Green Mountain Power – Electric Utility. Consulted via email on loss of power statistics and other resiliency projects planned for Dummerston.• Brattleboro Memorial Hospital – largest medical provider in the immediate region.• Dummerston Elementary School – they are also a local emergency shelter
Neighboring communities, local and regional agencies involved in hazard mitigation activities, and	The draft plan was provided via email for review and comment to: <ul style="list-style-type: none">• The Planning Commissions and Emergency Management Directors of the adjacent towns of: Brattleboro, Newfane, Marlboro, Brookline and Putney, VT and Chesterfield, NH

agencies that have the authority to regulate development	<ul style="list-style-type: none"> • Basin Planner for the Agency of Natural Resources Department of Environmental Conservation. • The plan was also sent to VEM for initial review, so the comments and input from all of the above-mentioned contacts and outreach strategies continued to be incorporated into the plan.
Representatives of nonprofit organizations, including community-based organizations that work directly with or provide support to vulnerable populations or frontline communities	<p>While this list is not exhaustive, here are a number of groups that serve vulnerable residents that received the draft plan for review and input (see appendix for outreach email):</p> <ul style="list-style-type: none"> • Dummerston Cares is a local organization that helps residents in need through a non-emergency phone referral service staffed by volunteers, assistance with minor home repairs for needy residents, an emergency fuel fund, a medical equipment loan program and more. • Dummerston Congregational Church • Senior Solutions – resource for aging Vermonters • MOOver – Provides regional bus and shared ride transport service. • The Gathering Place – Safe space for people with physical or cognitive impairments. • Groundworks Collaborative – Based in Brattleboro. Serves people who are facing housing and food insecurity. • Brattleboro Area Hospice – Provides programs to dying and grieving community members. • Health Care & Rehabilitation Services (HCRS) – A comprehensive community mental health provider. • Southeastern Vermont Community Action (SEVCA) – Anti-poverty, community-based non-profit. • Visiting Nurse and Hospice for VT & NH – Home, health, hospice and pediatric services. • Women's Freedom Center – Based in Brattleboro and working to end physical, sexual and emotional violence against women. • VT211 – non-emergency information resource for those facing crisis or are in need of guidance on available resources.

The planning process overview:

- Mid-2022 – Kick-off call to set up the public meetings and develop the Planning Team. The Emergency Management Director (EMD) was the local lead and invited team members.
- November 16, 2022 - The Committee reviewed the prior plan, completed the hazard assessment and reviewed hazard mapping at a Selectboard meeting.
- November-December 2022 – A public survey was advertised and linked on the town website, at the televised November Selectboard meeting and via the Town email Newsletter.
- December 2, 2022 – Alyssa met privately with the Road Foreman and the Co-EMDs to update the mitigation action progress from the 2017 Plan.
- December 13, 2022 – A virtual public meeting of the Planning Team that focused on development of mitigation actions.

**PLEASE COMPLETE THIS
LOCAL HAZARD SURVEY!**

The Town of Dummerston has begun the update process for the Town's Local Hazard Mitigation Plan. In an effort to gather information from the public for this Plan, please take a few minutes to complete [this brief survey](#). We value your input!

*Then, [click here for details](#)
on the 12/13 public meeting.*

- The draft was presented for internal town review by the Committee and other town personnel and appointees on February 7, 2024. This internal town review period was from Feb 7-22. One comment was received. Alyssa then finalized the draft for public comment which took place June 22, 2023 through July 10, 2023.
- A draft of the Plan was posted from June 22-July 10, 2023 on the town website for public comment.⁵
- Physical copies of the draft Plan were available for review in-person at the Town Office and the Community Library.
- No comments were received. Inter-town and provider communication will repeat for future revisions of this Plan.
- Flyers were put up around town for public comment on the draft.⁶

Advertisements for all public meetings were on the town website, the town Facebook page, Front Porch Forum, and at the three designated physical posting locations in town as required by State statute for all public documents. Each meeting lasted for a couple of hours and over the course of both meetings the group completed and discussed:

- **Update of the 2017 Dummerston Local Hazard Mitigation Plan**
 - Purpose
 - Process
- **Hazard assessment included:**
 - Discussion of hazard events that have occurred since the last Plan
 - Discussion of online public survey results
 - Review and update of hazard assessment
 - Marking up of the physical map and/or the online Vermont Natural Resources Atlas with local hazard notes
- **Mitigation Goals and Actions**
 - Review/edit prior plan goals
 - Update of prior mitigation actions
 - Create an updated Mitigation Actions Table
 - Identify current gaps and capabilities with implementation
 - Identify any changes in hazard or action prioritization
- **Other Updates**
 - Discussion of recent mitigation work completed by the town
 - Discussion of development trends – new developments, upcoming developments and vulnerability impacts
 - Overall resiliency concerns or ideas

Dummerston Hazard Mitigation / Resiliency Plan Public Meeting Announcement



Date: Tuesday, December 13

Time: 5:00-7:30 PM

Via Zoom: See Town website or use link
<https://us02web.zoom.us/j/82625027752>

Meeting ID: 826 2502 7752

Phone in: +1 646 558 8656 US

Help update Dummerston's Local Hazard Mitigation Plan!
What actions can the town take now to lower vulnerability to
flooding, fluvial erosion and invasive species?

For more information, contact
Alyssa Sabetto at 802-257-4547 x113



Data Sources

Information was gathered for this update through a variety of sources listed below. A summary of data sources is provided here with some additional specific references cited elsewhere throughout:

⁵ See appendix for posting.

⁶ See appendix for flyer.

- Surveys and warned, public meetings collecting public comment (issues raised were addressed in plan and the public meeting)
- 2023 Local Emergency Management Plan – local emergency resources
- Local knowledge of Planning Team members and other stakeholders – community impacts, priorities, trends, and overall plan guidance
- 2017 Dummerston Local Hazard Mitigation Plan – prior actions, goals, hazard assessment, and hazard profile information
- Flood Ready Vermont Community reports – NFIP participation data
- Flood Insurance Study (most recent is 2007) – FEMA flood hazard location information
- 2018 Dummerston Town Plan – community profile, mitigation related actions and goals
- US Drought Monitor to quantify historic periods of drought in Windham County
- Dummerston Zoning, Subdivision, and Flood Hazard Regulations - existing and desired land development patterns
- US Center for Disease Control – understanding of the risk of heat-related illness
- National Weather Services, including NOAA Events Data, NOW Data, and Climate at a Glance - climate trends, climate records, and special weather events
- 2020 US Census and American Community Survey 5-Year Estimates - population data
- VTrans Town Highway Bridge Inspection Reports – transportation infrastructure statistics
- Vermont Statewide Highway Flood Vulnerability and Risk Map
- Green Mountain Power - outage data and information on the power infrastructure
- 2023 draft State of Vermont Hazard Mitigation Plan – hazard profile information, state goals, and hazard extent data
- FEMA Disaster Declarations for Vermont – county level declared disasters
- VT ANR Atlas – location of River Corridors and Special Flood Hazard Areas
- FEMA Flood Insurance Rate Maps (effective 12/2/2015) - location of Special Flood Hazard Area
- U.S. Geological Survey National Water Information System - flood extent data
- WRC Local Liaison Reports of Storm Damage – local event impacts
- CRREL Ice Jam Database – mapped ice jams
- Review and input from Dover Conservation Commission Chair – invasive species section
- Local invasive plant list from Peter Bergstrom of the Rockingham Conservation Commission, sent 8/21/2021
- Communication with VT State Forester, Jim Esden, and Windham County Forester, Sam Schneski, on 2/21/20 – invasive species information specific to Windham region
- VT Fish and Wildlife website – invasive species section
- VTinvasives.org – invasive plant and insect data
- Vermont Department of Health – Heat data

HAZARD IDENTIFICATION AND RISK ASSESSMENT

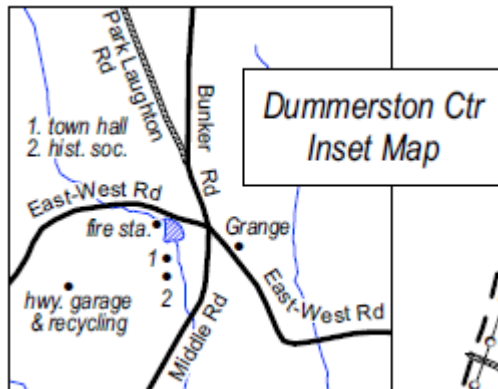
Community Assets

In addition to people, community assets relate to town owned buildings and infrastructure. The municipal buildings are all located on high ground that hasn't experienced flooding. Even though there are streams

close to municipal assets in Dummerston Center, the buildings are considered to be safely located. The assets in West Dummerston are clustered in an area uphill and across Route 30 from the West River. The primary assets are:

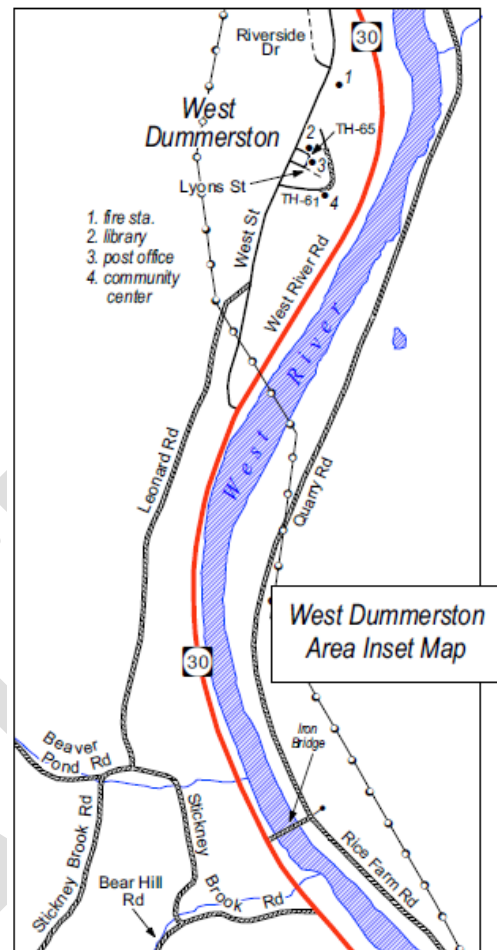
West of West River (in West Dummerston):

- West Dummerston Fire Station
- Library
- Post Office
- Community Center
- Store / Gas station



East of West River (in Dummerston Center):

- Town Hall
- Historical Society
- Grange
- Highway Garage
- Dummerston Congregational Church (shelter)
- Dummerston Center Fire Station
- Dummerston Elementary School (shelter)



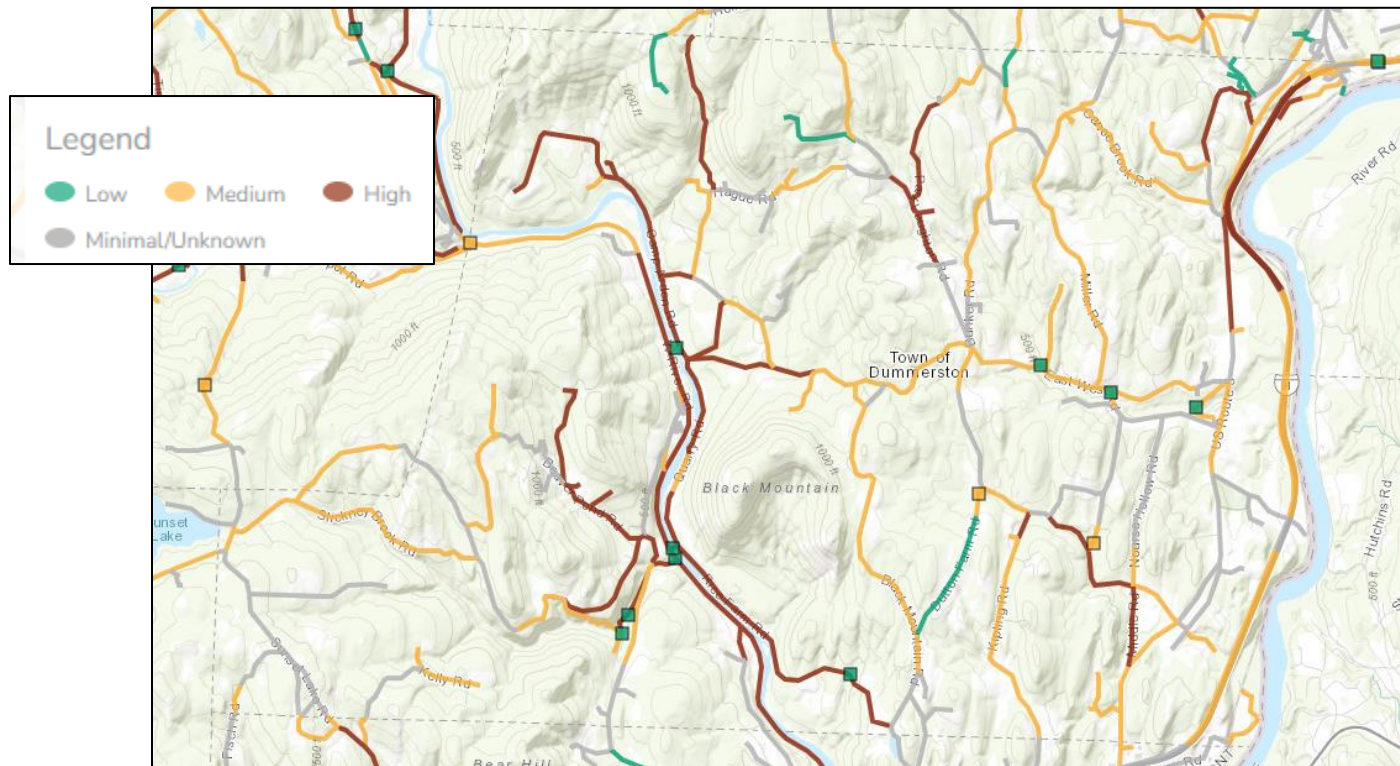
VTrans Transportation Infrastructure Vulnerability Mapping

The Vermont Department of Transportation has developed a 'Transportation Resilience Planning Tool' to quantify the flood vulnerability and risk of bridges, culverts, and road embankments throughout the state.⁷ Vulnerability assessments were completed for the following infrastructure:

- Road/river embankments along state and town highways
- All long structures (spans greater than 20 feet) on state and town highways
- All culverts and short structures on the state highway system

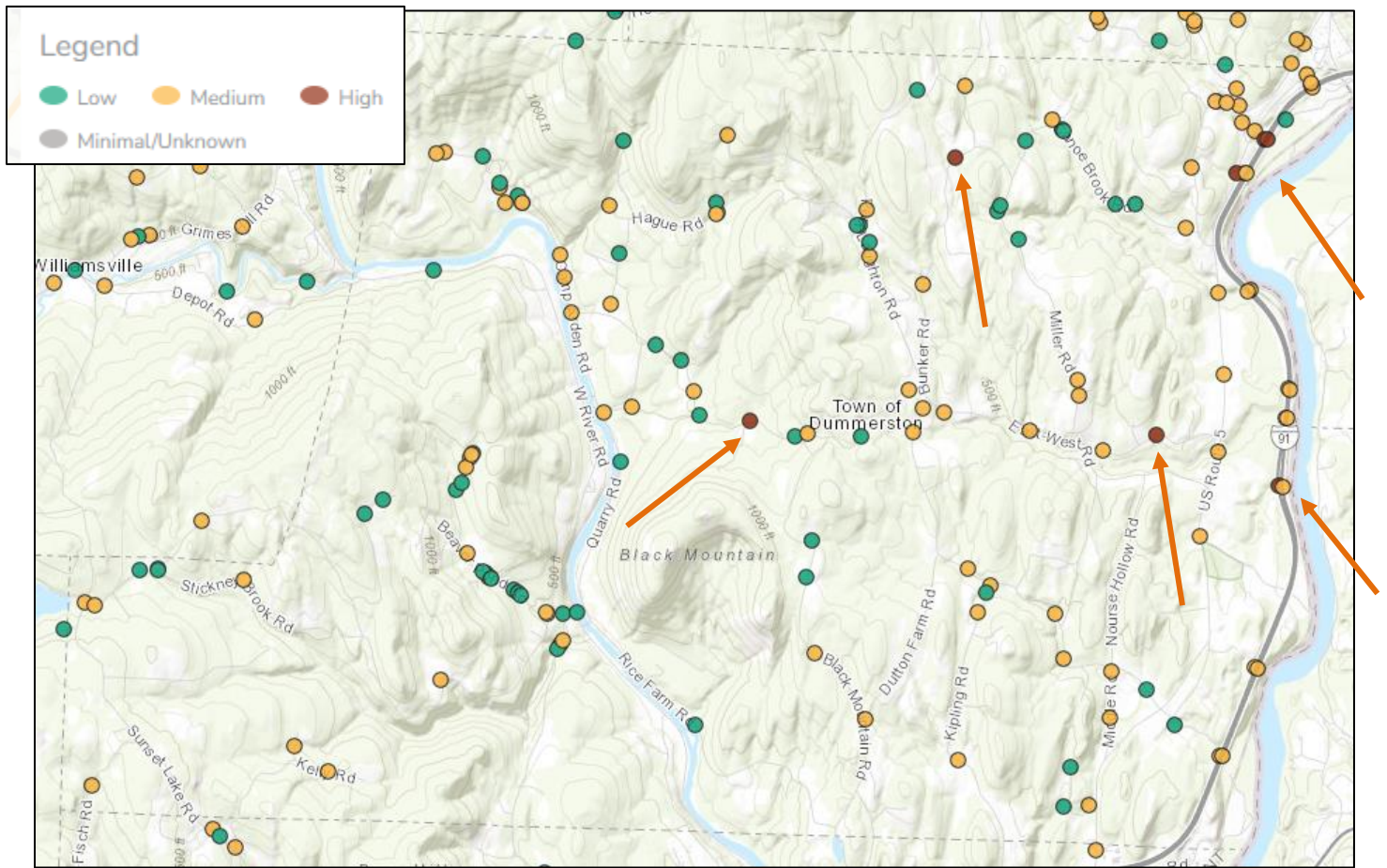
The map shown here provides a vulnerability analysis of roads and bridges that are at risk of inundation, erosion, or deposition related to a 100-year flood event. The Tool combines river science, hydraulics and transportation planning methods and is applied at a watershed scale. This data can be used to inform project scoping, capital programming, and hazard mitigation planning for state and local highways. The map shown here shows the vulnerability ranking of roads and bridges in the Town.

⁷ VTrans Statewide Highway Flood Vulnerability and Risk Website: <https://vtrans.vermont.gov/planning/transportation-resilience/statewide>



The map above identifies sections of Route 30, Beaver Pond Road, Middle Road, Route 5, and even a portion of I-91 as being highly vulnerable road segments, particularly due to erosion. No structures are ranked as highly vulnerable, but the maps shows 3 ranked as medium risk.

The below map is the same data, but showing culverts. There are a few highly vulnerable culverts, one on Bunker Road, one on East-West Road, one on Schoolhouse Road, and several underlying I-91.



The Transportation Resilience Planning Tool is a publicly accessible tool that can be accessed [here](#) or by searching for it online.

Federal Disaster Declarations for Windham County

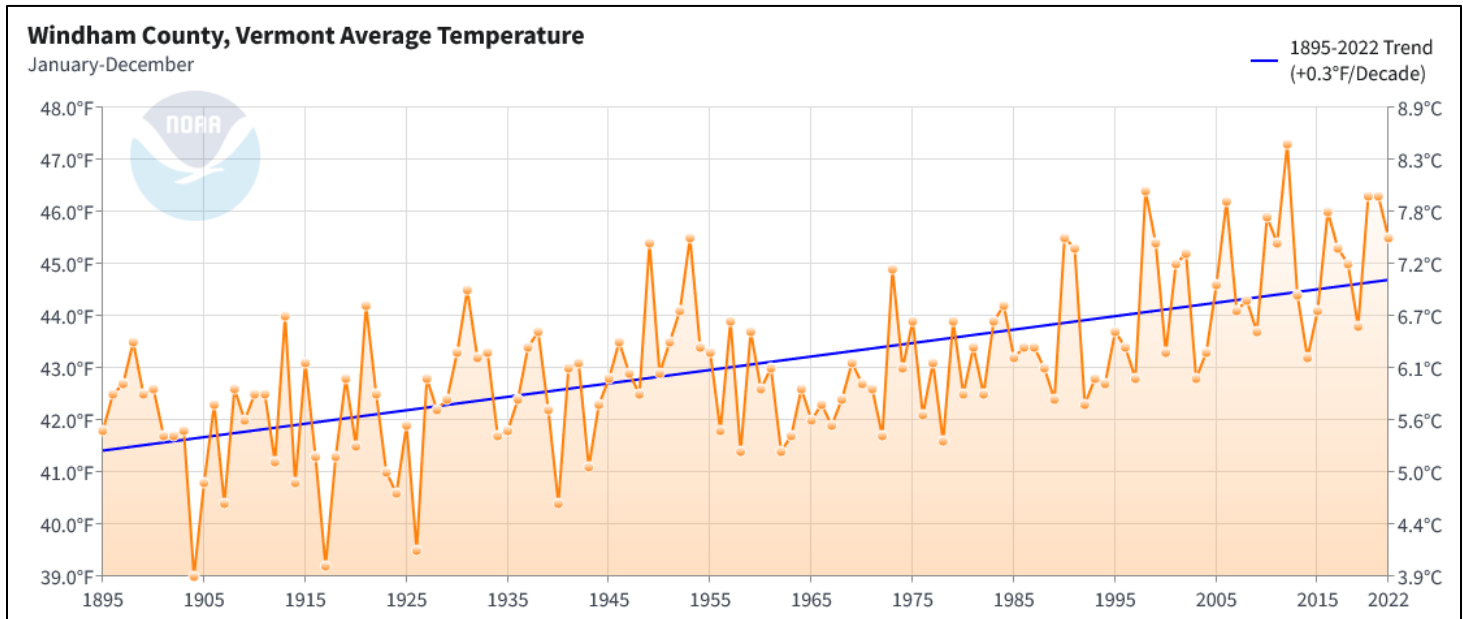
There have been 22 Presidential Disaster Declarations in Windham County since 1953: 8 Floods, 7 Severe Storms, 3 Hurricanes, 2 Biological Incidents (both Covid-19 related), 1 Snowstorm, and 1 Severe Ice Storm.⁸ July, August and September are the months that historically have seen the highest number of declarations.

Disaster Declarations for Windham County, VT						
Disaster Number	Incident Begin Date	Incident End Date	Declaration Date	Incident Type	Title	Disaster Close Out Date
3595 / 4720	7/7/2023	7/21/2023	7/14/2023	Severe Storms, Flooding, Landslides, and Mudslides	July 2023 Flooding	
4621	7/29/2021	7/30/2021	9/29/2021	Severe Storm and Flooding	SEVERE STORMS AND FLOODING	
3567	8/22/2021		8/22/2021	Hurricane	Tropical Storm Henri	
4532/ 3437	01/20/2020	5/11/2023	04/08/2020	Biological	Covid-19 Pandemic	
4356	10/29/2017	10/30/2017	01/02/2018	Severe Storm and Flooding	SEVERE STORMS AND FLOODING	
4043	5/20/2011	5/20/2011	11/8/2011	Severe Storm(s)	SEVERE STORMS AND FLOODING	1/14/2020
4022	8/27/2011	9/2/2011	9/1/2011	Hurricane	TROPICAL STORM IRENE	
3338	8/26/2011	9/2/2011	8/29/2011	Hurricane	HURRICANE IRENE	3/10/2014
1816	12/11/2008	12/18/2008	1/14/2009	Severe Ice Storm	SEVERE WINTER STORM	10/15/2014
1698	4/15/2007	4/21/2007	5/4/2007	Severe Storm(s)	SEVERE STORMS AND FLOODING	3/13/2013
1559	8/12/2004	9/12/2004	9/23/2004	Severe Storm(s)	SEVERE STORMS AND FLOODING	1/4/2011
1488	7/21/2003	8/18/2003	9/12/2003	Severe Storm(s)	SEVERE STORMS AND FLOODING	1/4/2011
3167	3/5/2001	3/7/2001	4/10/2001	Snow	SNOW	2/28/2005
1336	7/14/2000	7/18/2000	7/27/2000	Severe Storm(s)	SEVERE STORMS AND FLOODING	6/30/2008
1307	9/16/1999	9/21/1999	11/10/1999	Severe Storm(s)	TROPICAL STORM FLOYD	6/30/2008
1124	6/12/1996	6/14/1996	6/27/1996	Flood	EXTREME RAINFALL AND FLOODING	2/23/2005
1101	1/19/1996	2/2/1996	2/13/1996	Flood	ICE JAMS AND FLOODING	2/17/2005
518	8/5/1976	8/5/1976	8/5/1976	Flood	SEVERE STORMS, HIGH WINDS & FLOODING	4/16/1981
397	7/6/1973	7/6/1973	7/6/1973	Flood	SEVERE STORMS, FLOODING, & LANDSLIDES	11/12/1976
277	8/30/1969	8/30/1969	8/30/1969	Flood	SEVERE STORMS & FLOODING	5/26/1972

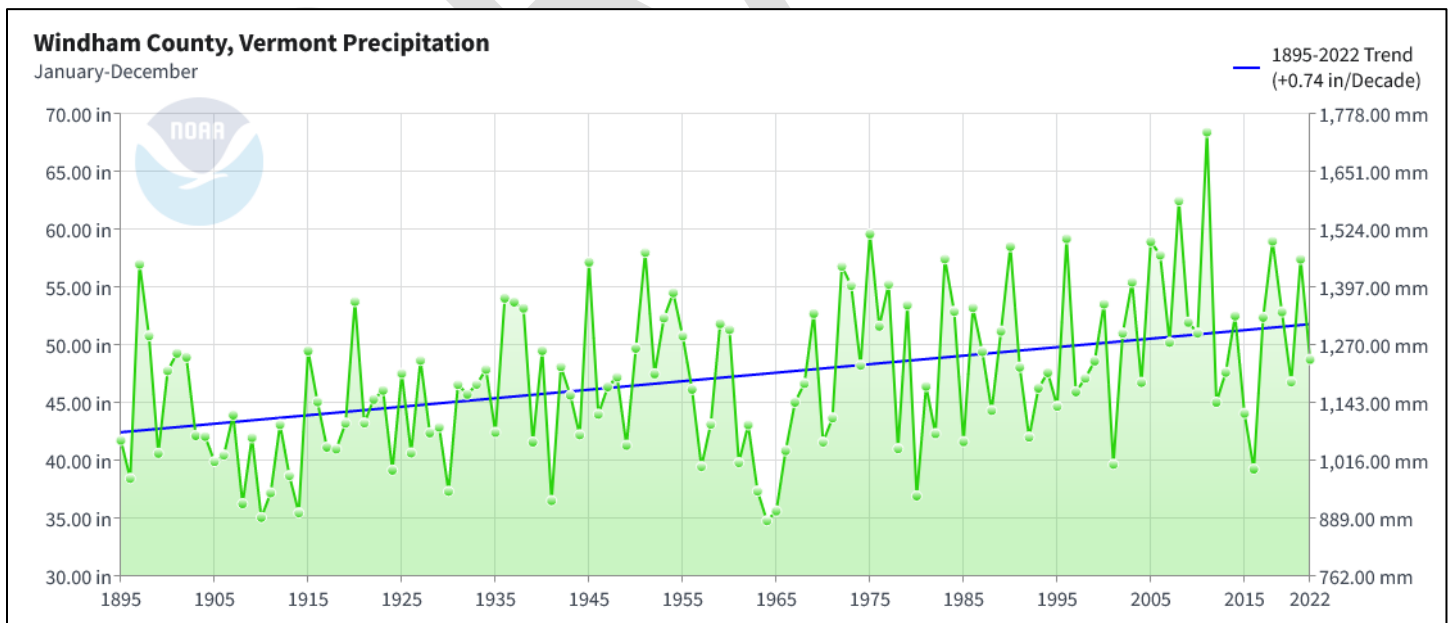
⁸ FEMA tool: Data Visualization: Disaster Declarations for States and Counties: Windham County, VT <http://www.fema.gov/data-visualization-disaster-declarations-states-and-counties> Accessed 9/15/2021

Climate Trends

In recent years, it has become evident that human activities, mostly associated with the combustion of fossil fuel, have added to the natural concentration of greenhouse gases in the atmosphere and are contributing to rapid climate change on a global scale. An analysis of average annual temperature in Windham County shows that temperatures are rising on an average of .3°F per decade (see below graph).



Annual precipitation is rising at a rate of about .74" per decade (see below graph). While projections of the effects of climate change vary, it is generally predicted that the region can expect to have warmer temperatures year-round, with warmer, wetter winters, and increasingly erratic patterns of precipitation.



Power Outage Statistics⁹

Green Mountain Power provided power outage statistics for the last 5 full years. Power outages present a vulnerability for those without backup power or that rely exclusively on electric for their heating or cooling. The data shows an upward trend over time in the 'number of times a customer was without power per year'.

	Avg Length of Outages in Hours Per Year	Avg # of Times a Customer was Without Power Per Year	# of Hours the Typical Customer was Without Power Per Year
2022	2.55	5.76	14.68
2021	3.28	5.06	16.59
2020	2.07	3.70	7.66
2019	2.86	2.56	7.34
2018	3.17	4.94	15.66
Annual Average 2018-2022	2.81	0.88	2.48


When a power outage occurs, communication systems become compromised. Landline phone service that has been converted from copper wire to fiber relies on an in-home battery back-up. The battery life is typically less than eight hours, whether the phone is used or not. Though most residents use cell phones, service in Dummerston is spotty, further complicating the problem of contacting emergency services during power outages.

To mitigate the impacts of power outages, the following public buildings/critical facilities have been equipped with back-up power or generator hook-up: Town office (serves as the EOC); Town Garage; both fire stations; Dummerston Elementary School (shelter); and a portable generator for the Congregational Church (town shelter). During a disaster, municipal response is managed by the EOC, this would include all communications – from phone calls to internet browsing and 2-way radio.

Connectivity is crucial in times of crisis. Telecommunications are needed for warning systems before disaster, as well as for response during and recovery after.

Hazard Ranking Process

A public survey was conducted to understand what natural hazards are of concern to people in Dummerston. The survey was on the Town website for several weeks and was advertised in the Town newsletter and at two Selectboard meetings. There were 10 responses to the survey. The hazards of highest concern are severe weather (major thunderstorms and winter storms, followed by high winds, drought, extreme temperatures, and invasive species.



**PLEASE COMPLETE THIS
LOCAL HAZARD SURVEY!**

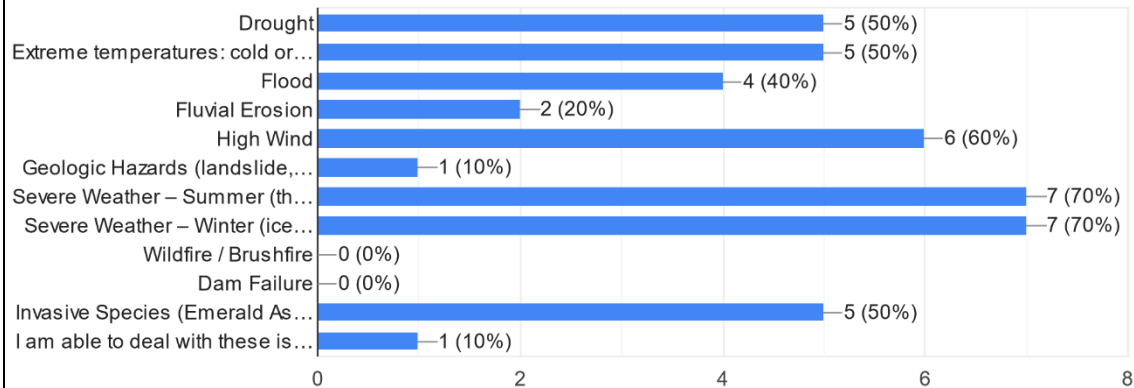
The Town of Dummerston has begun the update process for the Town's Local Hazard Mitigation Plan. In an effort to gather information from the public for this Plan, please take a few minutes to complete this brief survey. We value your input!

Then, [click here for details](#) on the 12/13 public meeting.

⁹ Data provided by Ken Couture of Green Mountain Power via email 11/3/2023.

7. Which of the following natural hazards have you or someone you know experienced while living or doing business in Dummerston? (select all that apply)

10 responses



The hazard ranking process has been revised since the 2019 plan was developed. The hazards considered now only include natural hazards and align with what is contained in the State Hazard Mitigation Plan. The rankings below are based on data in terms of previous occurrences, probability of future events, and links to climate change. Community input is provided for measuring vulnerability specific to assets and residents. The combination of these factors in a quantified measure produces a score. **Hazards receiving a score of 8 or higher considered medium or high and are profiled in this Plan. For Dummerston, this includes: Wind (including tropical storms), Fluvial Erosion and Inundation Flooding (combined, and including ice jams), Ice, Snow and Cold (combined), Invasive Species, Heat, Drought, Infectious Disease Outbreak and Landslide.** These hazards are inclusive of the hazards of concern to respondents of the public survey.

Possible Hazard	Previous Occurrences	Probability of Future Occurrences	Linked to climate change (add 1 point)	Vulnerable Assets	Vulnerable Residents	Score:
Wind	4	4	1	3	3	15
Fluvial Erosion	4	4	1	3	3	15
Ice	3	4	1	3	4	15
Snow	3	4	1	3	4	15
Cold	3	4	1	3	4	15
Inundation Flooding	3	4	1	1	2	11
Invasive Species	2	4	1	2	1	10
Heat	2	3	1	0	4	10
Drought	3	3	1	1	2	10
Infectious Disease Outbreak	1	3	1	0	4	9
Landslide	3	2	1	1	1	8
Hail	3	3		0	0	6
Wildfire	1	3	1	0	0	5
Earthquake	0	1		0	4	5

The rankings are based on this scoring break down:

Previous Occurrences (data driven):

Score	Meaning
0	No previous occurrences on record
1	One occurrence in last 50 years
2	Once every 10 years
3	Once every 1-5 years
4	More than once per year on average

Probability of Future Occurrences (data driven):

Score	Meaning
1	Unlikely
2	Possible
3	Probable
4	Highly Likely

Community input is made less subjective by quantifying vulnerability in relation to assets at risk and proportion of residents at risk.

Vulnerable assets (Community information):

Score	Meaning
0	None
1	1 asset, no community lifelines
2	2 assets, no community lifelines
3	3 assets, no community lifelines
4	4 or more assets, or any community lifeline

Vulnerable residents (Community information, specific to hazard location not the community as a whole):

Score	Meaning
0	None known
1	Less than ¼ of population
2	Less than ½ of population
3	More than ½ of population
4	All residents, town-wide hazard

Hazards with a ranking below 8 are considered low risk either because of rare occurrence or lack of community exposure. For hazards not profiled in this Plan, the reader can refer to the State of Vermont Hazard Mitigation Plan.



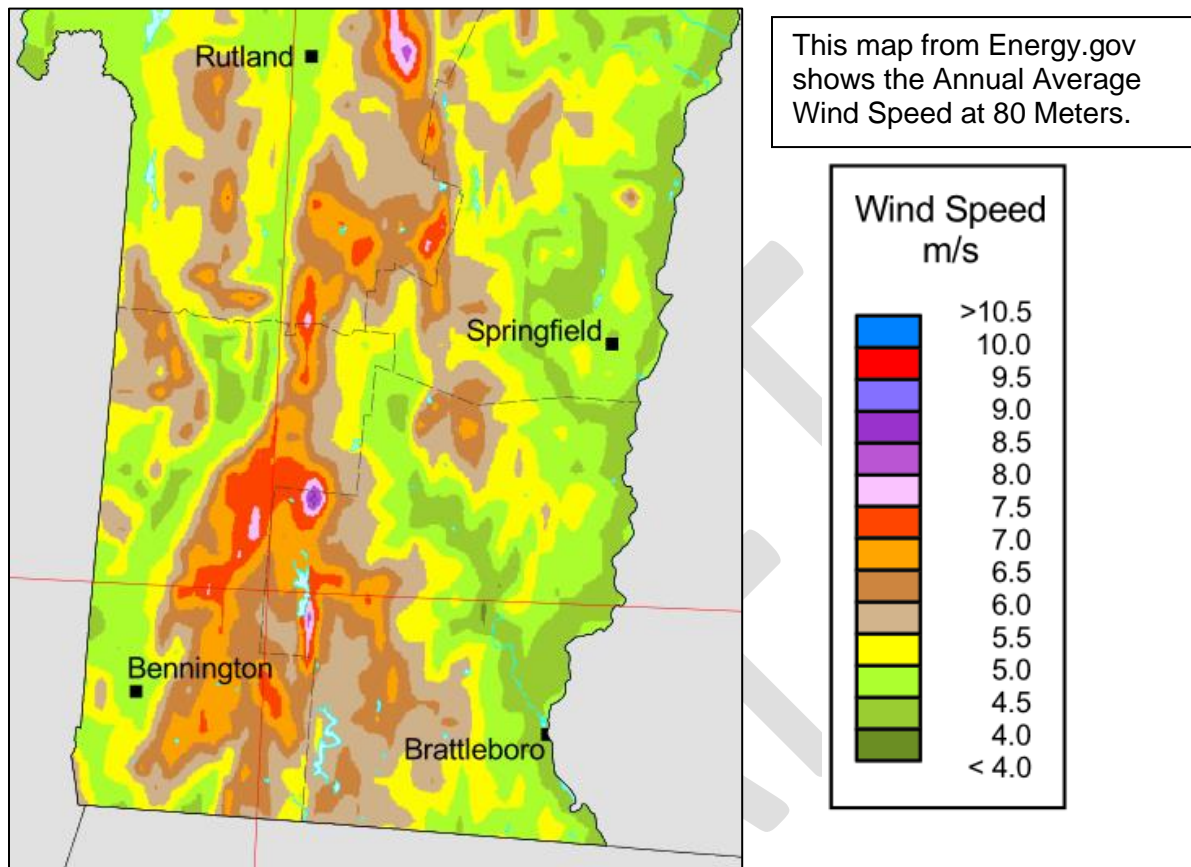
Highest Risk Hazard Profiles

High Winds

High winds in the region can be associated with thunderstorms, microbursts, straight-line winds, snowstorms, hurricanes, tropical storms or tornadoes. High winds tend to sweep through after the passage of a weather front. Power outage is primarily caused by high wind events taking trees down onto lines, even more so than ice. Trees downed by high winds can damage structures, block roads, and down power and communications lines. Mobile home parks and houses on ridge lines are at greater risk from wind damage. Blowing and accumulating snow is an issue of winds during winter months for open roadways.

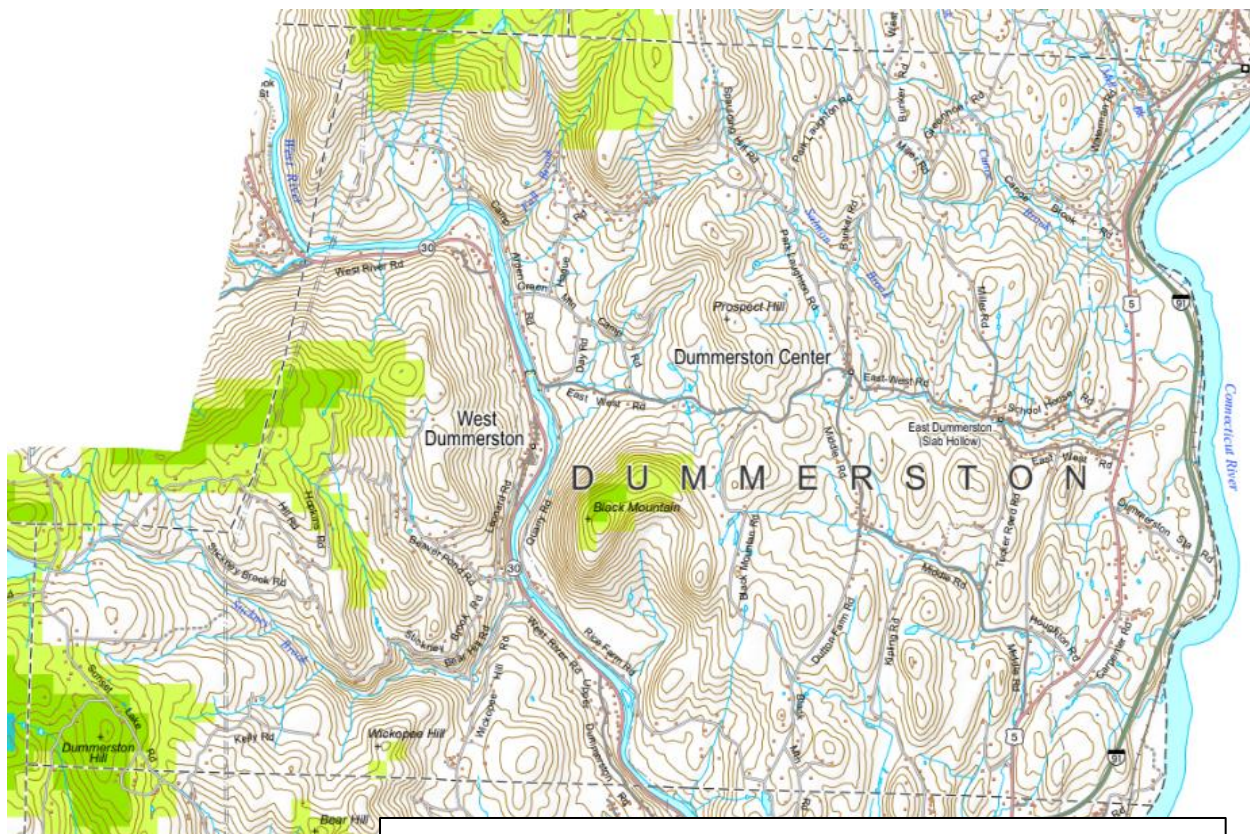
There are many trees in close proximity to roads, buildings and power lines. GMP trims trees near their lines only. There are areas where power lines go through the forest, so tree trimming is not as practical. Consolidated Communications does no tree maintenance. Town road crews generally do tree and limb cleanup, but there is not a lot of *preventative* tree maintenance at the town level.

High winds can affect any location, though higher elevations are at more risk. The below map shows annual average wind speeds for southern Vermont, and the spine of the Green Mountains predictably has the highest speeds. The purple area to the north of the highlighted square is Stratton Mountain, which gets particularly high winds and is the highest peak in the Windham Region.



For a more localized look at wind speed, the below map shows wind power opportunity correlated only to wind speed¹⁰. The higher elevations in town, areas such as Black Mountain and Dummerston Hill having the highest wind speeds.

¹⁰ This map was developed by the Windham Regional Commission for use by the Town and Region in energy planning efforts.



The Beaufort Wind Scale, one of the first scales to estimate wind speeds, was created by Britain's Admiral Sir Francis Beaufort in 1805 to help sailors estimate the winds via visual observations. The scale starts with 0 and goes to a force of 12. The Beaufort scale is still used today to estimate wind strengths. This scale is applicable to tropical storms within the 'Hurricane' scale wind speeds.

Force	Speed		Land Conditions
	knots	mph	
0	<1	<1	Calm, smoke rises vertically
1	1-3	1-3	Light air, direction of wind shown by smoke drift only
2	4-6	4-7	Light breeze, wind felt on face, leaves rustle, vanes moved by wind
3	7-10	8-12	Gentle breeze, leaves and small twigs in constant motion, wind extends light flag
4	11-16	13-18	Moderate breeze, raises dust, loose paper, small branches move
5	17-21	19-24	Fresh breeze, small trees in leaf begin to sway
6	22-27	25-31	Strong breeze, large branches in motion, umbrellas used with difficulty
7	28-33	32-38	Near gale, whole trees in motion, inconvenience felt walking against the wind
8	34-40	39-46	Gale, breaks twigs off trees, impedes progress
9	41-47	47-54	Strong gale, slight structural damage occurs
10	48-55	55-63	Storm, trees uprooted, considerable damage occurs
11	56-63	64-73	Violent storm, widespread damage
12	64+	74+	Hurricane, extreme destruction

The Enhanced Fujita Scale or EF Scale is used to assign a tornado a 'rating' based on estimated wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of Damage Indicators and Degrees of Damage which help estimate better the range of wind speeds the tornado likely produced. From that, a rating (from EF0 to EF5) is assigned¹¹. There have been 2 EF1 tornadoes and 1 EF2 tornado in Windham County since 1990.

EF SCALE	
EF Rating	3 Second Gust (mph)
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	Over 200

According to NOAA records, there have been 169 days with wind events since 1950 in Windham County, 66 of which caused property damage. Damage totals for these events together are \$1,411,400. Most record of wind events indicates in the 40-60 mile per hour range, with damages of several thousand dollars. More current and extreme events experienced in Windham County include:

5/16/2022	Wardsboro	70 mph	Thunderstorm winds
3/7/2022	Region-wide	40-50 mph	Thunderstorm winds
5/15/2020	West Dummerston	50 mph	Thunderstorm winds
8/21/2019	Windham	EF1	Tornado
7/28/2018	Regionwide	50-60 mph	Thunderstorm winds
11/10/2017	Region-wide	40-50 mph winds	High winds
9/5/2017	Region-wide	50-60 mph winds	Thunderstorm winds
6/8/2011	Northern Windham C.	50 mph	Thunderstorm winds
7/20/2008	Region-wide	50 mph	Thunderstorm winds
2/17/2006	Region-wide	60 mph generally; Stratton Mtn measured 143 mph gusts	High winds, likely snow storm

¹¹ National Weather Service < <https://www.weather.gov/oun/efscale> >

7/21/2003	Stratton	EF1	Tornado; \$100,000 in damages
6/5/2002	Windham	EF2	Tornado; \$75,000 in damages
9/16/1999	Region-wide	60 mph	Hurricane Floyd; \$175,000 in damages
7/6/1999	Guilford	90 mph	Microburst; \$150,000 in damages
7/3/1997	Eastern Windham C.	Not recorded	Thunderstorm winds caused \$100,000 in damages
9/21/1938	Region-wide	100+ mph	Hurricane Igor; \$400 million damages across southern Vermont; 600 lives lost; widespread destruction

Wind Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Downed trees, downed power lines, extended power outages; potential for injuries from falling debris or power lines; disruption to services and businesses	High winds in large storms are typically in the 40-60 mph range and in 1938 there was an extreme 100 mph event.	Camp Arden Road and Leonard Road, both along the West River, trees get knocked down in large storms; Overall trees lost, roads blocked, power outages, structural damage to houses	Score of 4; Highly Likely

Fluvial Erosion and Inundation Flooding

Flooding is the most widespread and destructive hazard in the United States and in the Windham Region. Flooding can occur anytime of the year as a result of heavy rains, thunderstorms, tropical storms, hurricanes, snow melt, or rain on snow. It can result from the overflow of major rivers and their smaller tributaries, or inadequate local drainage. Historically, floods have been a factor in over 80 percent of all federally declared disasters. People living in close proximity to bodies of water such as rivers, lakes, and streams are at greater risk from flooding than those not living in the floodplain. Municipal membership in the National Flood Insurance (NFIP) and having a compliant floodplain ordinance in place gives residents access to discount flood insurance and enables towns to regulate development within their regulated flood hazard area.

Much of the destruction from flooding in Vermont is due to fluvial erosion, which is the destruction of river banks caused by the movement of rivers and streams. This can range from gradual bank erosion to catastrophic changes in river channel location and dimension during flood events. This occurs when the stream has more energy than is needed to transport its sediment load, due to channel alterations or runoff events that increase water speed in the channel, leading to erosion. Major erosion events are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of

flooding that often accompany these events. The historic road network of many Vermont towns and villages typically follows waterways. This historic settlement pattern creates vulnerability for the road network, infrastructure and development in these areas. Climate change is leading to larger storms and larger flood and fluvial erosion events, putting more development at risk. This trend is discussed in the Climate Change section earlier in this Plan.



This photo shows the real connection of river and road during TS Irene, as the river reclaims its floodplain, edging in on the road. Photo courtesy of wilmingtonvtfloodrelief.com.

A waterway that is constrained or impinged by development is unable to reach geomorphic equilibrium which increases flooding in that area and puts increased pressure and larger flood loads on upstream and downstream sections, as well as causing more flooding damage. A river is in geomorphic equilibrium when its water, energy, sediment, and debris are in balance. In this condition a river is neither building up sediment in the channel nor losing sediment from its bed. Importantly, a river in equilibrium has not become overly deep and can continue to overflow onto its floodplains. The water that spills onto the floodplain slows down, and the velocity of the water still in the channel does not become excessively powerful. Mitigation actions that assist with achieving greater stream equilibrium will lessen or even eliminate flooding levels and damages to nearby buildings and infrastructure. Historic development patterns limit or complicate mitigation in some areas.

The biggest flood events in the Windham Region in recent years have been Tropical Storm Irene in 2011 and the July 2023 flooding. Irene (DR4022) caused \$31.9 million in public assistance damages for Windham County, \$7 million for Bennington County, and \$48.6 million for Windsor County. Total damage amounts for the July 2023 floods are still being tabulated as of this writing, but the amounts are expected exceed that of Irene. All FEMA received funds for Dummerston¹²:

DR #	Date of Declaration	Event Type	Awarded Amount
1307	11/10/1999	Severe Storm	\$ 6,440.84
1336	7/27/2000	Severe Storm	\$ 160,995.94
1559	9/23/2004	Severe Storm	\$ 165,428.61
3167	4/10/2001	Snowstorm	\$ 6,769.22
4022	(TS Irene) 9/1/2011	Hurricane	\$ 52,266.10
4621	9/29/2021	Flood	\$ 322,657.09
4720	(incomplete) 7/14/2023	Flood	\$ 4,582.37

Local Flooding Concerns and Experience

Dummerston has a very hilly/mountainous topography and is quite beautiful and remote. Because of its topography, nearly all the roads in Dummerston lie along waterways as these are the lower flatter areas of land in the town. Therefore, there are a lot of structures that also lie close to waterways. Some of the roads that the road crew monitors for washouts are the Spaulding Hill area, Bunker Road, Kipling Road,

¹² OpenFEMA Dataset: Public Assistance Grant Project Summaries

Tucker Reed Road, Old Ferry Road, Ryan Road, Rice Farm Road, Kelly Road, Sunset Lake Road, Hegg Road.

The hilly terrain leads to fast moving flood waters that don't have much opportunity to spread out into floodplains and slow their speeds. The *Crosby Brook Stream Corridor Restoration Plan*¹³ identified seven projects that will increase the Brooks floodplain access and stability. These projects are listed in this Plan after the Mitigation Actions Table.

FEMA floodplain lies along Salmon Brook, Canoe Brook, parts of North Branch of the Crosby Brook, South branch of the Crosby Brook, the West River and the Connecticut River. Though Dummerston Center is not in the FEMA defined floodplain, there is a brook there, with residences along it. Some of the highest hazard areas associated with flash floods are Dummerston and Spaulding Hills, Camp Arden Road, and areas on Camp Arden Road along the West River north of the covered bridge. These areas have seen flooding damage in recent years. Residences along the Connecticut River, and Kathan Meadow, and at the end of Dummerston Station Road are vulnerable to flooding. There is a low-lying area on Ferry Road north of C&S Wholesale near the Connecticut River that is also vulnerable.

There aren't chronic flooding spots in Dummerston. The Road Foreman has been very active in replacing undersized culverts, riprapping ditches and pitching the roads to mitigate damages. During Irene the West River rose significantly, but did not take out the bridges. The covered bridge is can hold large town vehicles but doesn't allow non-town heavy vehicles to pass without a permit, the green iron bridge can hold 20,000 lbs. If both bridges were taken out, West Dummerston would be separated from the rest of the town.

Flash floods typically occur in high elevation drainage areas as a result of summer thunderstorm activity. Drainage ditches and culverts are the biggest concern for local flash flooding events. Other areas of concern during flooding events are homes located along small brooks throughout town that are subject to rise during quick flash flooding events such as along Crosby Brook, Canoe Brook, Stickney Brook and Salmon Brook. Crosby Brook and Canoe Brook flooding mostly occurs in floodable open land. Canoe Brook doesn't have as much development on it. Crosby Brook headwaters are flatter and more developed.

Ice jam flooding is fairly common in the early springtime, generally around March. The heavy rainfall, combined with runoff from snowmelt due to the mild temperatures, results in flooding of rivers, streams and creeks, mainly from the formation of ice jams. Dummerston doesn't have mapped historic ice jams. However, sometimes jams will form on the West River south of Dummerston, and ice and snow fill the West River through Dummerston along Route 30. At times the ice buildup gets near to Route 30. Extent data is not available. These jams are monitored, but there has not been ice jam flooding that caused any damage to structures or infrastructure to date. Ice jam flooding has not reached onto Route 30 or caused damage to the road in Dummerston. Ice jam flooding is not an issue elsewhere in Dummerston. The probability of ice jam flooding is likely due to climate change increasing freeze/thaw cycles. Asset impacts are likely to increase due to the effects of climate change.



Flash flood on lower portion of Crosby Brook, July 2017. Photo taken by Zeke Goodband

¹³ *Crosby Brook Stream Corridor Restoration Plan* prepared by Fitzgerald Environmental Associates, LLC, June 1, 2009.

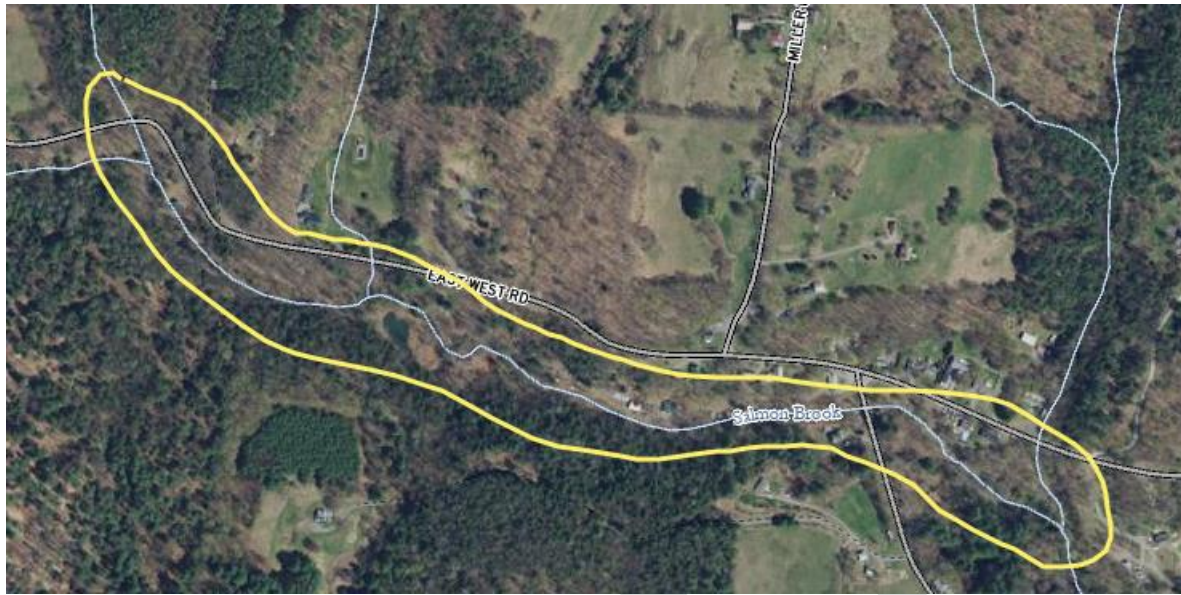
Events of the largest magnitude at the nearest recording station:

Highest Precipitation By Day: Marlboro, VT	
Date	Amount (inches)
10/30/2017 (DR 4356)	4.11
7/11/2023 (DR 3595/4720)	4.04
12/18/2023	2.99
6/27/2023	2.92
8/5/2020	2.89
9/19/2012	2.56
1/24/2024	2.53
3/14/2023	2.18
4/8/2022	2.17
5/1/2023	2.09
2/4/2022	1.85
11/3/2018	1.83
Period of record: 8/13/2003 to 1/11/2024	

There are a couple of areas in Dummerston where fluvial erosion is evident. Most issues are areas of gradual erosion where rivers and roads are close together. The first area is along East West Road near the intersection of Day Road (see the circled area). This area of concern is approximately 4.2 acres and there is a steep slope leading the waterway and the road is on the opposite bank, but erosion is causing trees to come down and lean, and for frequent edge erosion on the road during any larger rain event.

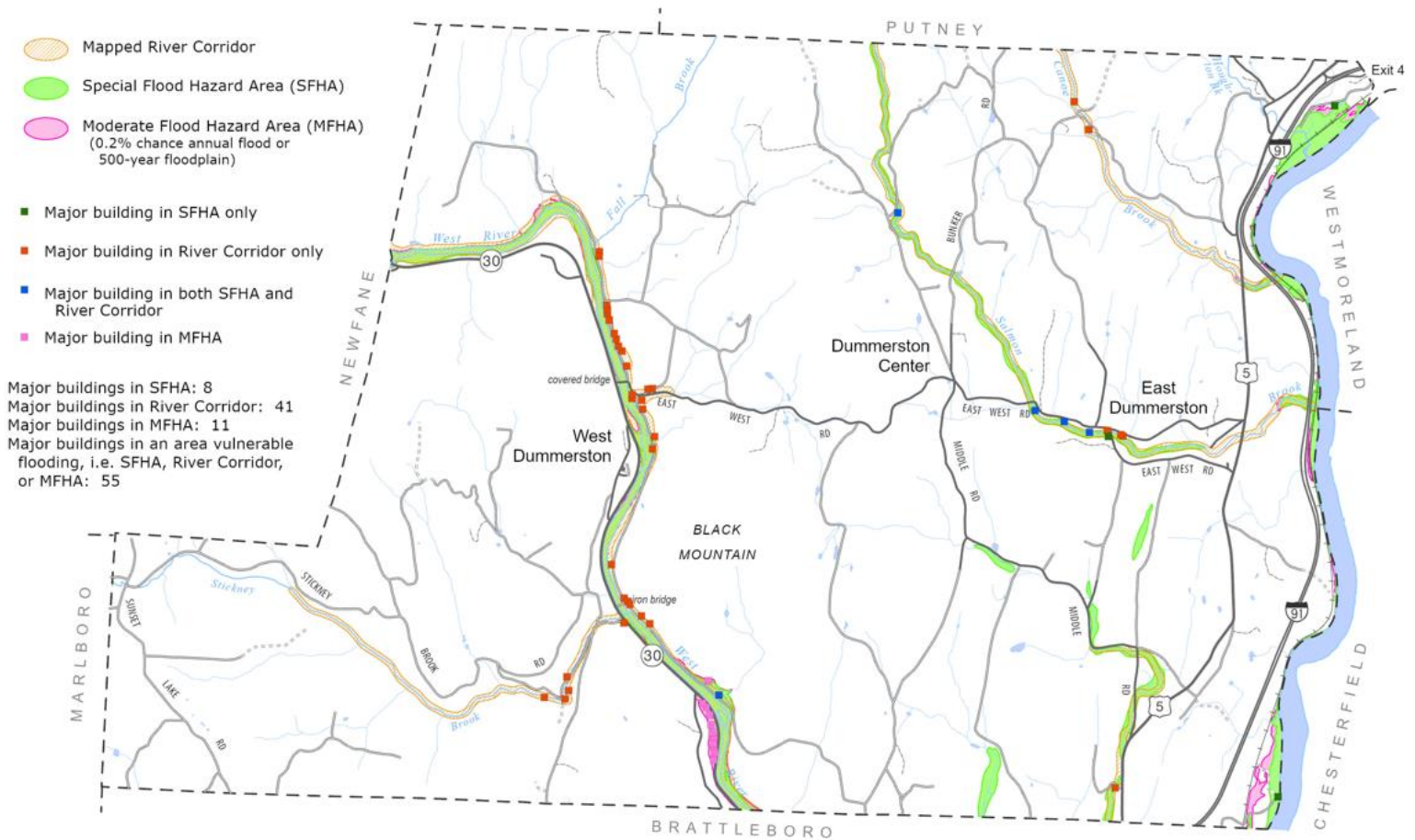


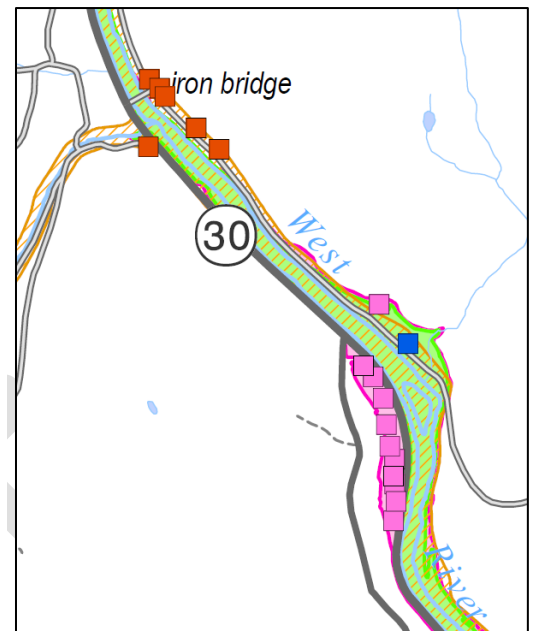
The second area of concern for fluvial erosion is along Salmon Brook where it lies close to East West Road and structures in this area. The area of concern is approximately 31.5 acres.



Structures in Mapped Flood Hazard Areas

The map here shows where structures are located in one or more flood hazard designated areas. Note the location of clusters of structures.





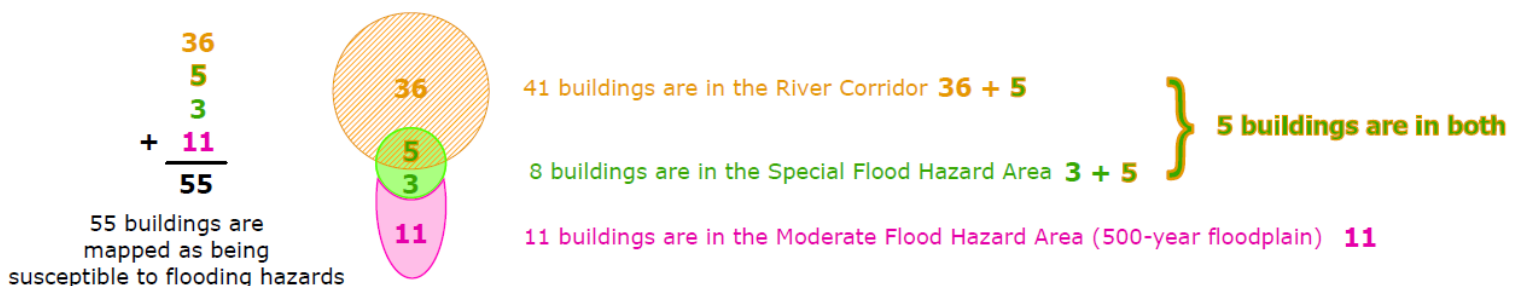
These inset views of the above map show the areas of Dummerston with the highest concentration of flood vulnerable structures. Note that two of these areas are also discussed in relation to fluvial erosion risk.

The FEMA mapped Special Flood Hazard Area or “SFHA” is the area subject to inundation by the 1% annual chance flood (100-year flood). FEMA also maps the .2% annual chance flood or the 500-year flood. To address the shifting dynamics of rivers in Vermont, the Vermont Agency of Natural Resources mapped River Corridors, which areas subject to fluvial erosion. Together this mapping can assist in creating an understanding of where flood hazards exist and where towns should consider limiting development and focusing mitigation strategies. Official flood mapping is viewable by accessing the [Vermont ANR Atlas](#), on the [FEMA Map Service Center](#), or by contacting your Town.

Fifty-five structures are in a mapped flood hazard area; including residential dwellings, and commercial properties. No publicly owned facilities are located in mapped flood hazard areas.

According to FEMA, 16% of these properties have flood insurance. In total, these 9 policies cover \$2,645,000 in value.

There are 0 repetitive loss properties.



Property owners with a federally backed mortgage on a building in the SFHA are required to purchase flood insurance. A town being a member of the National Flood Insurance Program (NFIP) provides residents with access to flood insurance through the NFIP. If a town is not a member of the NFIP, residents must buy the required insurance on the private market. Properties outside of the FEMA floodplain can optionally purchase flood insurance at a lesser expense, and it still covers damages resulting from fluvial erosion in events that damage multiple properties.

Flood Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
FEMA SFHA, FEMA 500-year floodplain, VT ANR mapped River Corridors	Culverts, bridges, dams; properties near rivers and streams; septic systems. 55 buildings are located in FEMA or ANR mapped flood hazard areas.	The largest rain event was 4.11 inches on 10/30/2017 (DR 4356). The largest area of fluvial erosion is along Salmon Brook near East West Road in East Dummerston (31.5 acres).	Ice jams can occur on the West River more in Brattleboro, but sometimes backing up to almost JB Auto. Flooding generally: Damage and debris to roads; flooding to residential properties; some stream bank collapse; streambank erosion.	Score of 4; Highly Likely

Ice, Snow, and Extreme Cold

Winter weather often results in temporary road closures, school and business delays, and even power outages. Given the high amount of snowfall this region experiences, the town and residents are generally well prepared to deal with normal winter weather conditions. Severe winter storms, however, have been shown to affect the entire region resulting in:

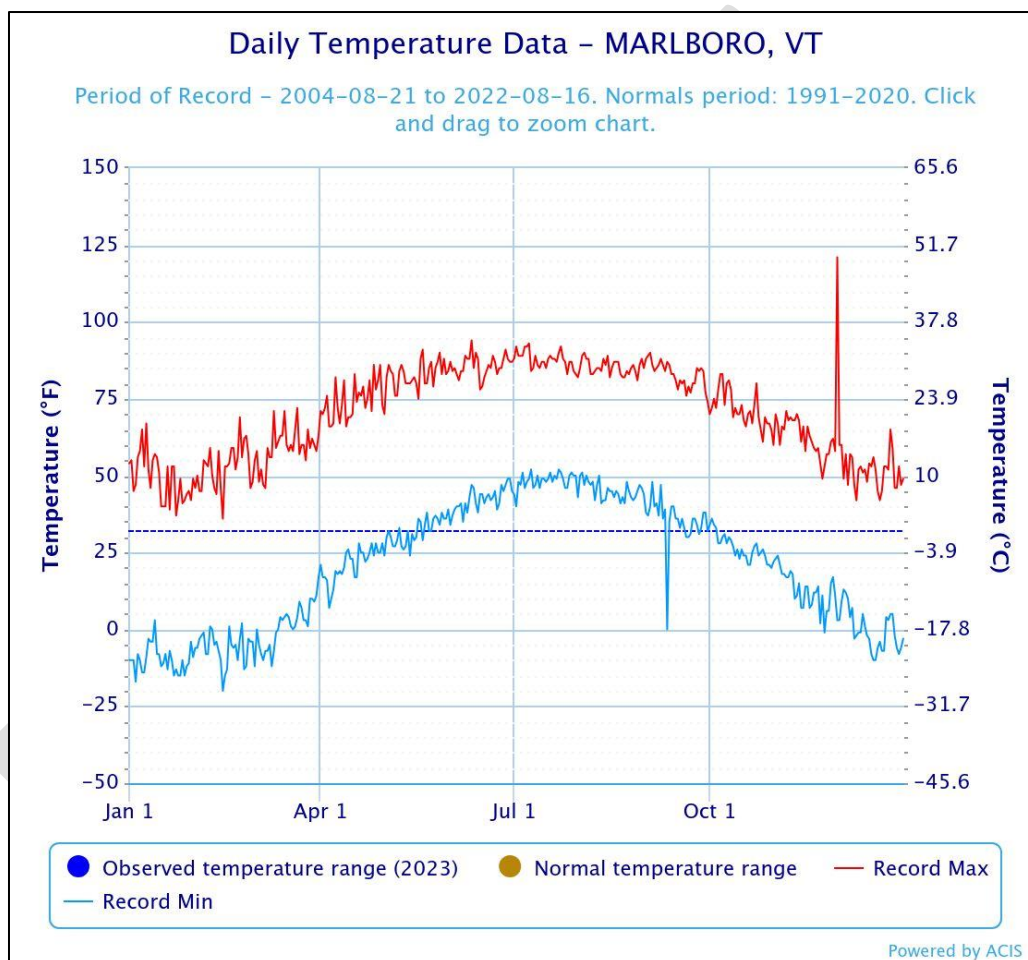
- Extensive damage to above-ground power and utility lines and extended power outages (March 13-15, 2023 storm);
- Road shutdowns, making general travel, transport, and emergency vehicle access difficult;
- Shutdown of schools, businesses, and local government services, limiting access to goods and services;
- Structural failure from excessive snow loading, especially barns (storm of Dec 2008, DR 1816);
- Injuries and fatalities from poor driving conditions, frostbite, hypothermia, heart attacks from overexertion, and carbon monoxide poisoning from blocked vents.

Severe winter weather affects the entire planning area, though higher elevations generally experience more extremes. An ice storm crossed the region in December of 2008 causing widespread downed trees and power outages in the region. The total cost of damages across the region triggered a Presidential Disaster Declaration DR-1816. Damage consisted of roads being blocked due to downed trees and utility lines. Thousands lost power for varying lengths of time and several shelters were opened. An event in March 2023 had similar results and 1-to-5-day power outages varying throughout the region, but did not trigger a federal declaration.

Extreme cold can cause damage to buildings and infrastructure. Cold temperatures alter the chemical composition of mortar, grout, and adhesives used in building construction which over time can lead to unsecured components. Extreme cold can cause frozen pipes which can cause significant damage to buildings. Town buildings should be winterized, with pipes drained and water shut off, in the event an extreme cold event is forecast. Additionally, town highway and fire department vehicles are vulnerable to damage. Keeping them indoors and properly maintained can help to limit damage.

Snow accumulation typically has not made the Town vulnerable to loss of road accessibility. The Town's fleet of snowplows ensures all roads are accessible, even in major accumulation events. Roads adjacent to critical facilities are well maintained. The change of winter storm events from mostly snow to rain and ice has increased the Town's risk with downed trees and resulting power outages, which are previously discussed in the High Wind hazard profile.

The below chart depicts historic temperature variations in the region (Marlboro is the NWS monitoring station for the region) to the present. The observed extreme temperatures for the period of record for each day are shown in highs (red) and lows (blue) with records going back to 2004. The coldest temperature on record is -15° on February 15, 2016, although wind chill factors have probably approached or even exceeded that benchmark on occasion.



The region usually experiences at least one large event every year or two. There have been three winter storm related declarations in Windham County:

- Winter Storm (DR1816) – December 11-18, 2008
- Snowstorm (DR3167) – March 2001
- Ice Jams and Flooding (DR1101) – January 1996

Extreme snowfall records are 36" in one day measured in West Wardsboro on December 19, 1986; the multi-day extreme recorded snow event was 41.6" measured in Marlboro on March 15, 2023.

Ice, Snow, and Extreme Cold Summary Table

	Location	Vulnerability	Extent	Observed Impact	Probability
Ice	Town-wide, with higher elevations being at greater risk of extremes	Road accidents, power outages, damage to property, docks, shorelines	The largest rain event was 4.11 inches on 10/30/2017 (DR 4356). The largest area of fluvial erosion is along Salmon Brook near East West Road in East Dummerston (31.5 acres).	Extended power outages; road accidents; carbon monoxide from improper use of generators	Score of 4; Highly Likely
Snow	Town-wide, with higher elevations being at greater risk of extremes	Roofs prone to collapse from weight; Power lines and trees; impassable roads due to snow drifts; indirect injuries from overexertion; Unsafe travel, especially for school buses and ambulances	Extreme snowfall records are 36" in one day measured in West Wardsboro on December 19, 1986; the multi-day extreme recorded snow event was 41.6" measured in Marlboro on March 15, 2023.	Roof collapse on at risk structures; road accidents; power outages from downed trees and wires; school cancellations and delays; outdoor recreation events cancelled;	Score of 4; Highly Likely
Cold	Town-wide, with higher elevations being at greater risk of extremes	People living in older structures; energy burdened households Structure fires Damage to water pipes Damage to agricultural crops	The coldest temperature on record is -15° on February 15, 2016 in Marlboro	Burst water pipes and flooding; school cancellations and delays; outdoor recreation events cancelled;	Score of 4; Highly Likely

Invasive Species: Plants and Insects



Invasive plant species are a region-wide hazard; however, each location will be confronted with a distinct

mix of invasive species that thrive under the particular ecological conditions of that place. Each invasive species has a different potential to spread to other areas based on the rate at which it spreads and the ecological suitability of the ecosystem that it is expanding into.

An invasive species can be defined as **an exotic species whose introduction into an ecosystem in which the species is not native and causes or is likely to cause environmental or economic harm or harm to human health**¹⁴.

Invasive Plant Species

In the absence or near absence of natural predators or controls, invasive non-native plants are able to spread quickly and out-compete native plants. Invasive plant species can create monocultures, which often provide poor habitat for native animals that have not evolved with the non-native species, resulting in degraded habitat value and increased vulnerability. The invasive plant issue really escalated in the early 1990's. Invasive plants tend to thrive in disturbed areas. Within the Windham region, they are more prolific in the towns along the Connecticut River than they are to the west, because the eastern towns are more populated, contain major transportation routes such as I-91 and the rail corridor, which serve as vectors for their expansion, and tend to have significant land disturbance. Some of these plants were originally planted because of their positive aspects such as their ability to grow in difficult growing conditions, long growing season length, their large seed production and their ornamental value. These same reasons are a big part of why they have become invasive.



Black Swallowwort carpets a bank to the exclusion of almost everything else. It even twines up a utility pole guy wire. Note the abundant seed pods. (Photo courtesy of John Anderson, Dummerston)



Japanese knotweed, vtinvasives.org

Heavy travel corridors like VT Routes 9 and 100, and I-91, and even waterways, such as the Connecticut and Deerfield Rivers and their riparian areas, act as corridors that invasives can overtake and spread along.

Particular invasive plant concerns in the Windham region are listed in two groups based on their estimated threats to natural and hard infrastructure. All (except spindle tree) are quarantined, Class B Noxious Weeds in Vermont¹⁵.

Group A—Higher threats to infrastructure:

1. There are heavy infestations of Japanese Knotweed (*Fallopia japonica*) along the North Branch of the Deerfield River and the Rock River, as well as the lower reaches

of several brooks. It leaves shorelines susceptible to erosion because there is no other vegetation stabilizing the stream bank (Basin 11 Management Plan, Preliminary Draft 2007). TS Irene both (1)

¹⁴ (USDA) https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/technical/ecoscience/invasive/?cid=nrcs142p2_011124

¹⁵ Vtinvasives.org is the primary website for information. This list was developed by Peter Bergstrom of the Rockingham Conservation Commission. Email dated 8/21/2021.

eroded stream and river banks, removing many riparian trees, and (2) moved fragments of knotweed to new areas, thus allowing knotweed to flourish on the bare soil left in its wake.

2. Asiatic (Oriental) bittersweet (*Celastrus orbiculatus*), an aggressive climbing vine that can smother trees, utility poles, and buildings.
3. Amur, Morrow's, Tartarian, and Bell's honeysuckle (*Lonicera mackii*, *morrowii*, *tatarica*, *x bella*)
4. Japanese & Common barberry (*Berberis thunbergii* & *B. vulgaris*), which promote Lyme disease by harboring high populations of deer mice, one of the intermediate hosts of deer ticks.
5. common and glossy (European) buckthorn (*Rhamnus cathartica* & *R. frangula*), which slow forest regrowth.
6. Burningbush (*Euonymus alatus*)—still a common ornamental in yards, spreading to woods via birds that eat the low-value fruit, little wildlife value, should be excavated.



Group B—Lesser threats to infrastructure:

7. Mile-a-minute vine (*Persicaria perfoliate*), on Federal invasives list that is included in state list. Considered a “watch list” species in VT, but can cover other plants as well as hard infrastructure.
8. Garlic mustard (*Alliaria petiolate*) is common along roads and in fields and riparian areas, and can invade forests.
9. European spindle tree (*Euonymus europaeus*)-locally problematic, not on VT invasives list; suggested for addition to it. Very hard to control. You can buy seeds on eBay.
10. Goutweed (*Aegopodium podagraria*)—Highly invasive, has solid green leaves, or variegated green & white leaves. Very hard to control.
11. Norway maple (*Acer platanoides*)—inhibits growth of nearby plants spread widely by seeds to nearby woods, little food or habitat value to wildlife. Should not plant any new ones. Provides good breeding habitat for Asian long-horned beetles (ALB).
12. Purple loosestrife (*Lythrum salicaria*)
13. Yellow flag iris (*Iris pseudacorus*)—wetland plant
14. Amur maple (*Acer ginnala*)
15. Tree-of-heaven - Looks very similar to sumac and walnuts (black and butternut) but has smelly leaves when crushed, and smooth leaf margins except at the base.
16. Wild Chervil (*Anthriscus sylvestris*) - This invasive plant can be seen starting in May alongside roads, and is notable in our rolling Vermont fields. Often confused for Queen Ann's Lace which blooms later in the summer.

Five groups of invasive plants, listed below, are thought to pose the highest threat to native and/or hard infrastructure. Barberry is also a human health threat (Lyme disease).

Common name	Latin name	Locations	Threats	Control
Japanese Knotweed	<i>Fallopia japonica</i>	Banks of all rivers and many brooks	Can grow through asphalt, into basements, and block trails; more	Mowing (endless), repeated cutting & digging (3-10

			likely to wash out than natives	years), mesh?
common and glossy (European) buckthorn	<i>Rhamnus cathartica</i> & <i>R. frangula</i>	Clearcuts, woodland edges	Prevents regrowth of native trees	Excavation including roots
Japanese & Common barberry	<i>Berberis thunbergii</i> & <i>B. vulgaris</i>	Planted shrub, escapes to woods	Increases deer mice which harbor deer ticks with Lyme disease	Excavation including roots
Burningbush	<i>Euonymus alatus</i>	Planted as ornamental, birds spread seeds to woods	Displaces native shrubs	Excavation including roots
Amur, Morrow's, Tartarian, and Bell's honeysuckle	<i>Lonicera mackii</i> , <i>morrowii</i> , <i>tatarica</i> , <i>x bella</i>	Planted as ornamental, birds spread seeds to woods	Displaces native shrubs	Excavation including roots

Invasives tend to come up early and flower early, allowing them to get established before native plants have the chance. It may be possible to slow down or even halt the spread of these species by identifying and removing plants as soon as they appear. Early detection is the key. This detection can be aided by educating residents about the identification of and problems caused by invasive species. Preventing the spread of invasive plants is something that everyone can assist with. The first step is to not plant non-native plants on your property and to remove invasives that exist. Additionally, it is important that when soil is disturbed, to plant native cover before invasives have a chance to establish themselves. Proper disposal of non-native vegetation is critical to avoid its spread, safely burning the material when possible. Avoid transporting non-native plants, including firewood and garden debris, as this is critical to prevent the spread of non-native seeds and insects. Mowing roadsides from the north to the south can also help prevent the migration of invasive seeds on-site.

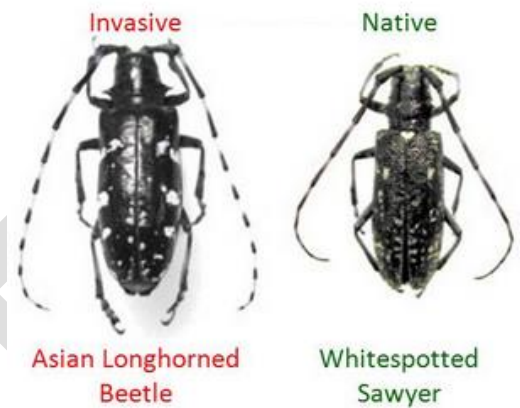
Local impact: Black swallowwort, an aggressive invasive vine plant with small purplish black flowers, is rampant along Route 30 and is working its way up the West River Trail. It is present throughout Dummerston and goes north to at least Townshend. Some plants can't take the use of salt on roads, but a newer invasive – slender cottonweed – is working its way up I-91 and along Route 5 sparsely – and it appears to be a salt tolerant plant. Buckthorn, Oriental bittersweet, Japanese barberry and burning bush (winged euonymus) are found at the Dutton Pines State Forest Park.

There are heavy infestations of Japanese Knotweed along the West River banks, and a newly discovered patch near the covered bridge on the west side of the river near the recreational beach and the bank is at risk of erosion. TS Irene eroded the banks so much and allowed for the flourishing of invasives on the bare soil left in its wake. Six years later, the trees were starting to get reestablished in these riparian areas, and they are knocking back the Japanese knotweed somewhat by shading it out. This tree-cover may self-contain it until the next storm. Purple loosestrife is commonly seen in many riparian and wetland habitats in the region. Phragmites is a newer invasive, a tall grass, that invades wet areas to the point where nothing else will grow, and has been seen in Dummerston. It has even been spotted in remote areas away from roadways, so is possibly wind-spread. Other species such as Oriental bittersweet, certain species of honeysuckle, Japanese barberry, yellow flag iris, and common and glossy (European) buckthorn have become well established in many locations including in the Prospect Hill town forest. Garlic mustard has been found along roads in Dummerston. Knapweed is semi-invasive that has been found along the power line corridors and railroad tracks—where it seems capable of withstanding spraying. Yellow rattle is another invasive flowering plant, a parasite on grass, is now being seen on power lines. Dummerston is fortunate to have an active and educated Conservation Commission who are passionate about invasive species monitoring and control.

Invasive Insects

Non-native invasive species cause irreversible impacts on tree health, forest composition, and biodiversity. Species of concern include:

- Ash yellows – present throughout VT
- Asian longhorned beetle – not confirmed in VT; closest area to the Windham region that has the pest is Worcester County, Massachusetts in 2008; this insect will have a major impact if it becomes established in Vermont.
- Balsam wooly adelgid - present throughout VT
- Beech bark disease - present throughout VT
- Beech leaf disease - confirmed in southeastern Vermont
- Butternut canker - present throughout VT
- Chestnut blight - present throughout VT
- Dutch elm disease – has spread throughout VT
- Elm zigzag sawfly – not yet confirmed in VT
- Elongate Hemlock scale – confirmed in parts of VT
- Emerald Ash borer – confirmed and spreading in VT
- Hemlock wooly adelgid – confirmed in southern VT
- Jumping worms (3 species found in VT) - confirmed in all Vermont counties with the exception of Essex and Orleans
- Oak wilt – not yet detected in VT, but has recently been found in in multiple locations in New York state.
- Pear thrips - present throughout VT
- Red pine scale – not confirmed yet in VT
- Sirex woodwasp – confirmed in parts of VT
- Spongy moth – established in VT
- Spotted lanternfly - been found in several states, including Pennsylvania, Connecticut, Delaware, Maryland, New Jersey, New York, Virginia, and West Virginia and Ohio; not yet established in VT, but an interception of truck cargo in VT did find 3 adults of the species
- Thousand cankers disease – never been detected in VT
- Wandering broadhead planarian - distribution is currently unknown. This species was recorded for the first time in Montréal, Canada in 2019
- White pine blister rust - present throughout VT
- Winter moth - never been detected in Vermont.



Between emerald ash borer (EAB), Asian longhorned beetle (ALB) and hemlock wooly adelgid (HWA) alone, more than 14 different species of trees in Vermont are threatened including: maple, elm, horse chestnut, willow, ash, poplar, European mountain ash, hackberry, and hemlock. EAB is spreading fast; within the Windham region, as of this writing EAB is present in these towns, listed with detection year:

- Brattleboro 2023
- Guilford 2023
- Halifax 2023
- Londonderry 2019
- Marlboro 2023
- Putney 2023
- Readsboro 2020
- Somerset 2022
- Townshend 2022
- Vernon 2021
- Westminster 2023
- Whitingham 2023
- Wilmington 2021



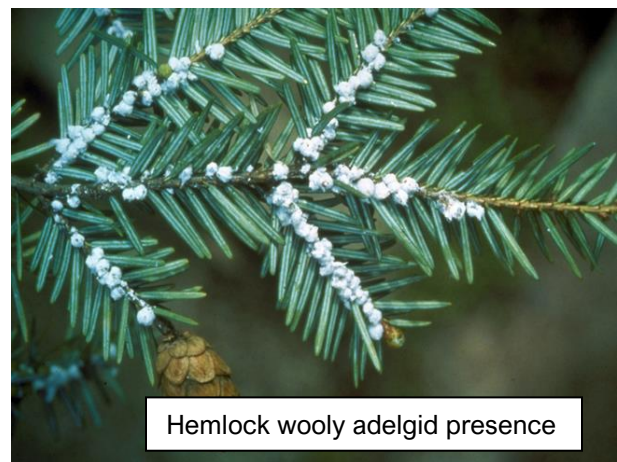
EAB only feeds on Ash trees, but that is 7% of Vermont's tree species. EAB is often moved around on firewood that people transport. Eradicating the insect on wood requires heating it to at least 140 degrees or higher for greater than 60 minutes.

EAB essentially girdles the ash trees, killing them. It lives between the inner bark and the wood, so it isn't that deep. Woodpeckers like feeding on EAB, but the woodpecker population isn't large enough to significantly impact the EAB population. Also the woodpeckers don't generally detect the insects in the trees until they have been present for about two years, which is too late to save the tree. One of the best diagnostic methods for detecting EAB is called "blonding". "Blonding" is a clear symptom of EAB infestation. It occurs when woodpeckers, while foraging for the succulent EAB larvae, flake off outer layers of bark, revealing the lighter or blond-colored inner layers of bark.¹⁶ The hemlock woolly adelgid (HWA), *Adelges tsugae*, is a tiny insect from east Asia that attacks forest and ornamental hemlock trees. It feeds on young twigs, causing needles to dry out and drop prematurely. Trees may die in four to six years. Some survive, but with sparse foliage, losing value as shelter for wildlife and their ability to shade streams.



Sustained cold leads to kill off of the adelgid insects. Mortality rates of even 91%, however, can still lead to population growth through the warm season because they reproduce asexually so it only takes one for the population to expand. The HWA mortality rate shifts each year based on temperature patterns throughout the year, especially cold winter temperatures cause die off.

In the Windham region, it was initially found in Brattleboro and the Guilford area. It is now found in 14-15 Windham Region towns, and has been recently found in Springfield in Windsor County. HWA is moving south to north in lower elevations first, and is mostly throughout southern Vermont at this point. Dead or dying hemlocks are a sadly regular sight in the region. It was first found at the SIT campus in 2010 and is now found throughout the town of Brattleboro.



¹⁶ University of New Hampshire Cooperative Extension – Blonding on Ash trees information sheet.
http://extension.unh.edu/resources/files/Resource004103_Rep5824.pdf Accessed 3/2/15.

Hemlock trees and even whole stands are showing signs of decline, but trees in Vermont have not been reported to have been killed from HWA alone. Foresters have been watching infested trees for eight years, and the trees haven't been killed yet most likely because winter temperatures kill off enough of the HWA to give the tree a temporary reprieve. HWA does weaken the trees to the point that other secondary stresses, such as funguses and disease, may result in their mortality. Another pest, Hemlock elongate scale was found recently for the first time in Guilford, Vernon and Brattleboro.

Local impact: Dummerston currently has one trained First Detector on the Conservation Commission who is trained to detect invasive forest pests. Dummerston takes invasive species seriously, and the Town's Conservation Commission holds yearly community educational programming on invasives, which address what property owners can do on their own land. They have invasives removal work days about once a year and have been coordinating with the Prospect Hills trustees to address buckthorn and honeysuckle on the Prospect Hill town conserved land. The Conservation Committee members regularly remove invasives removal at the rain garden near the VTrans lot along Route 30 and from the Fort Dummer State Park.

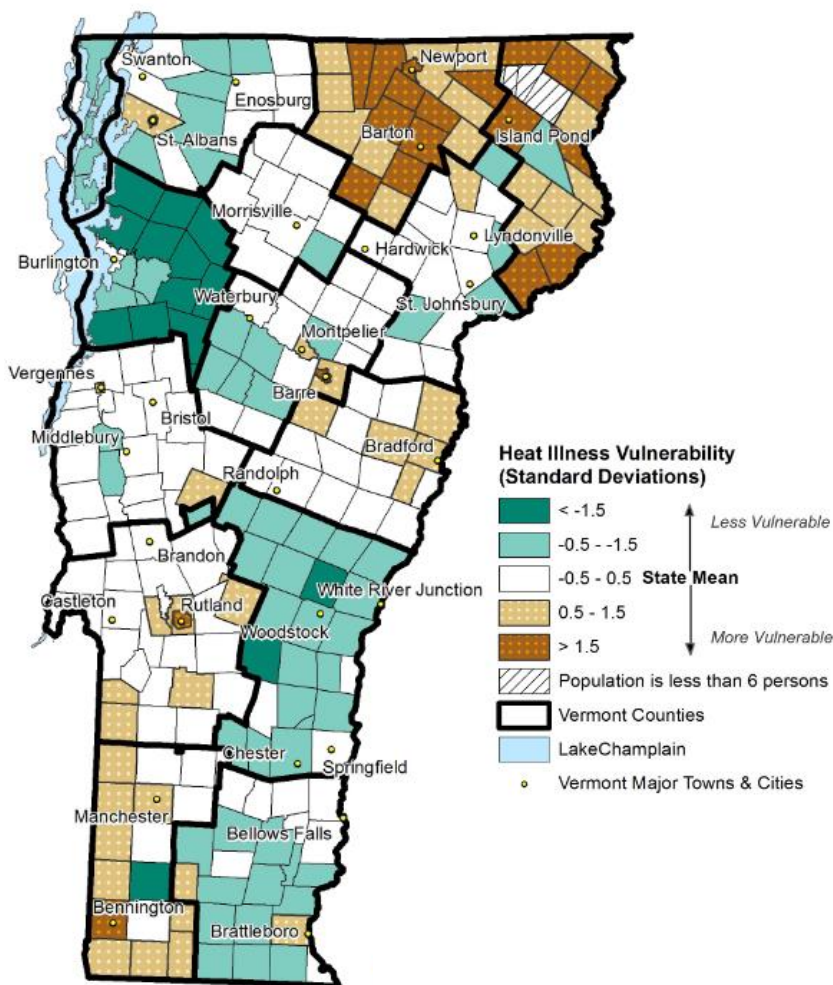
Invasive Species Summary Table

	Location	Vulnerability	Extent	Observed Impact	Probability
Plants	Elevations generally below 1,500 feet are most susceptible to invasive species, although any land with some sort of major disturbance (from wind, water, logging, or land clearing and development) could potentially host them.	Areas at particular risk are road sides, newly cleared areas, disturbed land, riparian buffers, especially eroded buffers; power line right of ways	There are heavy infestations of Japanese Knotweed along the West River banks. Japanese barberry, yellow flag iris, and common and glossy buckthorn have become well established in many locations including in the Prospect Hill town forest. Garlic mustard has been found along roads in Dummerston.	Dead and dying trees along roadways and powerlines, and near buildings; invasive plants along roadways and waterways; Compromised soil stability along waterways. Overgrowth in shallow waters that kill off other plants and block sunlight.	Score of 4; Highly Likely
Insects	Town-wide; areas where firewood is transported into the area from away, like campsites, are at higher risk	Forests, agriculture, waterways, native species; risk of downed trees in public rights of way from EAB and other pests.	EAB is present in 13 Windham region towns and spreading; HWA is ubiquitously present in Dummerston. Over half of the trees in Vermont are host species of one of these three main pests, so the potential impact is great.	Dead and dying trees along roadways and powerlines, and near buildings; threats real and potential to local forest economy related to maple syrup industry, fall tourism, and logging	Score of 4; Highly Likely

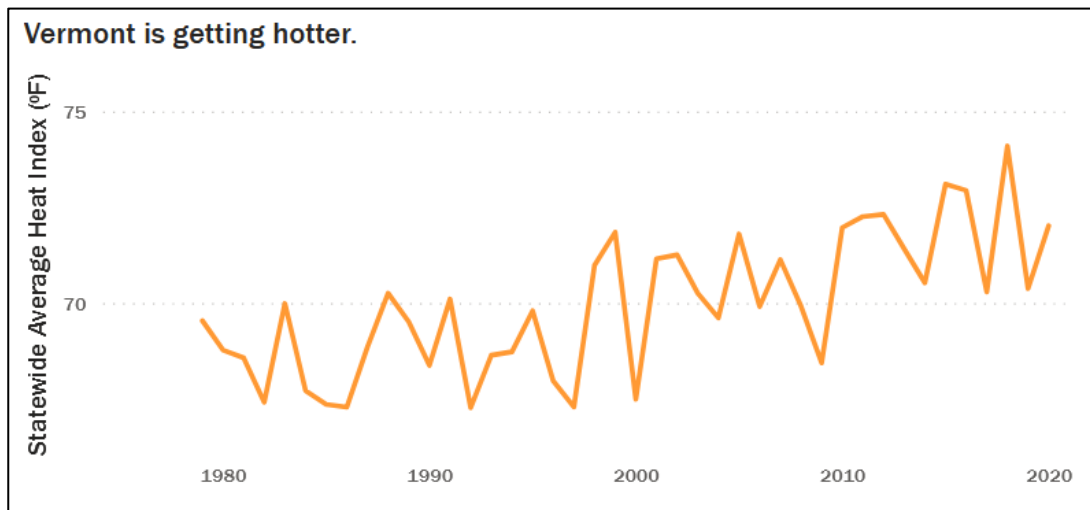
Heat

The Centers for Disease Control reports that more people die from heat than other weather-related events. The actual number of deaths are most likely underreported because heat can exacerbate other underlying conditions such as heart and respiratory disease, leading to death¹⁷. The impacts of extreme heat can be particularly challenging in areas like the Windham Region where residents are not accustomed to high temperatures and are less likely to live in air-conditioned structures.

As a rule, the National Weather Service considers “excessive heat” to be an event when the maximum heat index is expected to be 105° or higher for at least two days and nighttime air temperatures will not drop below 75°. The primary impact of extreme heat or prolonged periods of hot weather is to human life. Hot conditions, especially when combined with sun and high humidity, can limit the body’s ability to thermoregulate properly. Prolonged exposure to hot conditions can lead to heat cramps, heat exhaustion, heat stroke, or exacerbate other pre-existing medical conditions. Some of these impacts require medical attention and can be fatal if left untreated. Children and the elderly are especially vulnerable to heat-related illnesses. The map to the left is a Heat Vulnerability Index developed by the Vermont Department of Health. The Vermont Heat Vulnerability Index draws together 17 different measures of vulnerability in 6 different themes: population, socioeconomic, health, environmental, climate, and heat illness. These measures are combined to measure the overall vulnerability of Vermont towns to heat-related events.



¹⁷ Centers for Disease Control, Heat Related Illness: Picture of America Report



Windham County has an average of 12 excessive heat days per year; Windsor County has 14 days yearly on average; and Bennington County has 9. Overall, the graph below shows that the statewide average heat index is increasing over time. With this trend, towns should be considering ways to assist residents with managing and getting cool during excessive heat days, through cooling shelters and community pools. Retrofitting town buildings to have air conditioning will also become more necessary over time.

Heat Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Children, elders, people with underlying conditions, people below the poverty line; water supplies and water bodies; livestock	2018 has the highest number of excess heat days, 18 in all counties in the region	Increased hospitalizations due to heat-related illness (VT Dept. of Health data), five heat-related deaths reported statewide in the summer of 2018	Score of 3; Probable

Drought

Drought is defined as a shortage of water relative to need. According to the Vermont 2018 Hazard Mitigation Plan, drought is a complex phenomenon for several reasons:

- It is difficult to monitor and assess because it develops slowly and covers extensive areas, as opposed to other disasters that have rapid onsets and obvious destruction.
- The effects of drought can linger long after the drought has ended.
- Drought is an inherent, cyclical component of natural climatic variability and can occur at any place at any time, making it difficult to determine the onset, duration, intensity, and severity, all of which affect the consequences and corresponding mitigation techniques.

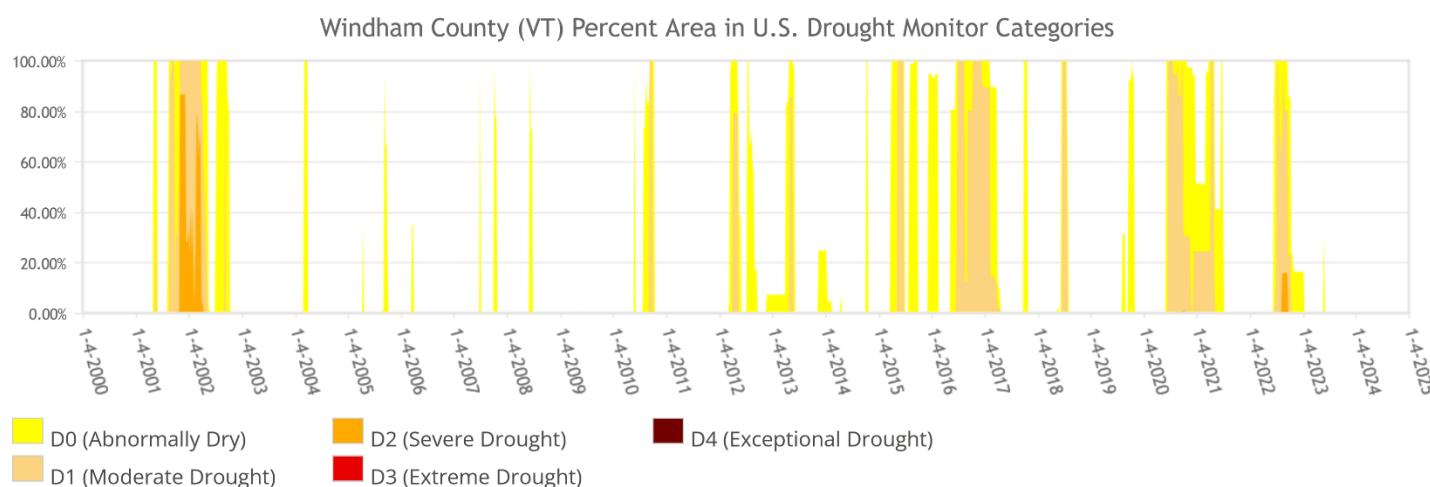
Extended periods of drought during a Vermont growing season can be devastating for agriculture. USDA data show occasional payouts from crop insurance due to drought damage, but this data is at the county level. Furthermore, not all local growers carry crop insurance. Forestry operations are susceptible to drought as well, because extended warm and dry seasons can increase risk of disease. Drought also weakens or kills wildlife, and the dieback of vegetation and increased risk of wildfire destroys habitat.

Drought can also result in loss of potable water when wells run dry. Although the surface waters may appear to have recovered from a period of drought following a return to normal precipitation, replenishing

groundwater levels is a longer process. Low water levels in wells can yield higher concentrations of metals (uranium, iron, sulfur, arsenic, and manganese) in drinking water, making the water unsafe to drink.

Drought conditions are also favorable for wildfires. Low water levels can also affect recreation and fishing. Low water levels, paired with rising temperatures, can trigger occurrence of blue-green algae in lakes and ponds. High winds, low humidity, and extreme temperatures can all amplify the severity of the drought. The severity of a drought depends on the duration and extent of the water shortage, as well as the demands on the area's water supply.

It seems paradoxical that while climate change is generally bringing increased levels of precipitation that Vermonters should experience drought. However, climate change also is linked to climate instability and extremes. Due to climate change the increasing frequency and duration of droughts will also increase impacts to town assets. According to the US Drought Monitor, Windham County has experienced some level of drought every year since 2012. Minor portions of the county also experienced severe drought (D2) in August 2022. The worst period of drought on record was between November 2001 until March 2002.¹⁸



From the U.S. Drought Monitor website, <https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx>, 1-17-2024



In late 2020, USDA Farm Services Agency issued a declaration of drought-related disaster conditions, making all Vermont farmers eligible to apply for emergency loans. With drought conditions persisting for more than a year, the State of Vermont reactivated its Drought Task Force in July 2021.

The Agency of Natural Resources maintains a crowd-sourced database called the ANR Drinking Water Drought Reporter. <https://anrmaps.vermont.gov/websites/droughtreporter/>. As of this writing, three private wells are showing water shortages in the Windham Region.

Drought Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Crop loss, loss of drinking water, higher occurrence of algae blooms; increased risk of wildfire	Worst drought was Nov 2001 to March 2002; some level of drought experienced yearly since 2012	Loss of drinking water	Score of 3; Probable

¹⁸ US Drought Monitor website: <https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx>, accessed 1/17/2024

Infectious Disease Outbreak

COVID's unprecedented disruption of daily life is a grim reminder that climate change increases the risk of future infectious disease outbreaks. According to the Centers for Disease Control, vector borne illnesses such as Lyme disease, West Nile virus disease, and Valley fever are already on the rise and spreading to new areas of the United States. Milder winters, warmer summers, and fewer days of frost make it easier for these and other infectious diseases to expand into new geographic areas and infect more people.

The COVID-19 pandemic resulted in the first ever major disaster declaration of all 50 states, five territories, and the District of Columbia. In March of 2020, by Executive Order No. 01-20, the Governor declared a State of Emergency for Vermont, and restrictions to protect public health were enacted. While a variety of measures were recommended by the Center for Disease Control and the Vermont Department of Health to help curb the spread of disease, including frequent hand washing, wearing masks, and keeping a distance of 6 feet from other persons, vaccination was identified as the best way to keep from getting and spreading COVID-19. In Vermont, the vaccine was first made available to residents and staff of long-term care facilities in December 2020, and then to those 75 and older in mid-January 2021. The Vermont State of Emergency was extended for over a year until all restrictions were lifted on June 14 of 2021, when the benchmark of an 80% vaccination rate for the eligible population of Vermont was reached.

Even though the State of Emergency is behind us, the long-term impacts are still unclear. As of August 2023, the Vermont Department of Health reports that COVID hospitalizations are low, and there is one case reported in Orleans County. As of January 2024, the US Centers for Disease Control report 1,101 COVID deaths in Vermont. As of December 2023, the Vermont Department of Health reported 101 deaths in Bennington County, 54 deaths in Windham County, and 75 deaths in Windsor County, since January 2020. The death toll is based on death certificates that list COVID as a cause or probable cause of death. The Department of Health does not publish death counts at the municipal level.

Essential services, government operations, schools and businesses were severely disrupted during COVID, requiring rapid implementation of safety protocol to continue critical operations. While "social distancing" was an appropriate response to mitigate the spread, all sectors of the regional population experienced some form of disruption, especially those with no broadband or spotty broadband coverage. The pivot to a virtual environment has demonstrated that reliable broadband is a vital utility for business, work, school, healthcare, and civic involvement.

Local impact: To cope with Covid-19, Dummerston public facilities had to quickly learn how to move to a remote work setting. There is still a hurdle with remote town operations, but with new fiber optic internet coming, that should assist with remote needs going forward. Unreliable communication capabilities made it difficult sometimes and the town should invest in technology to increase remote capacity. Training of town staff may be necessary to build comfort with new methods.

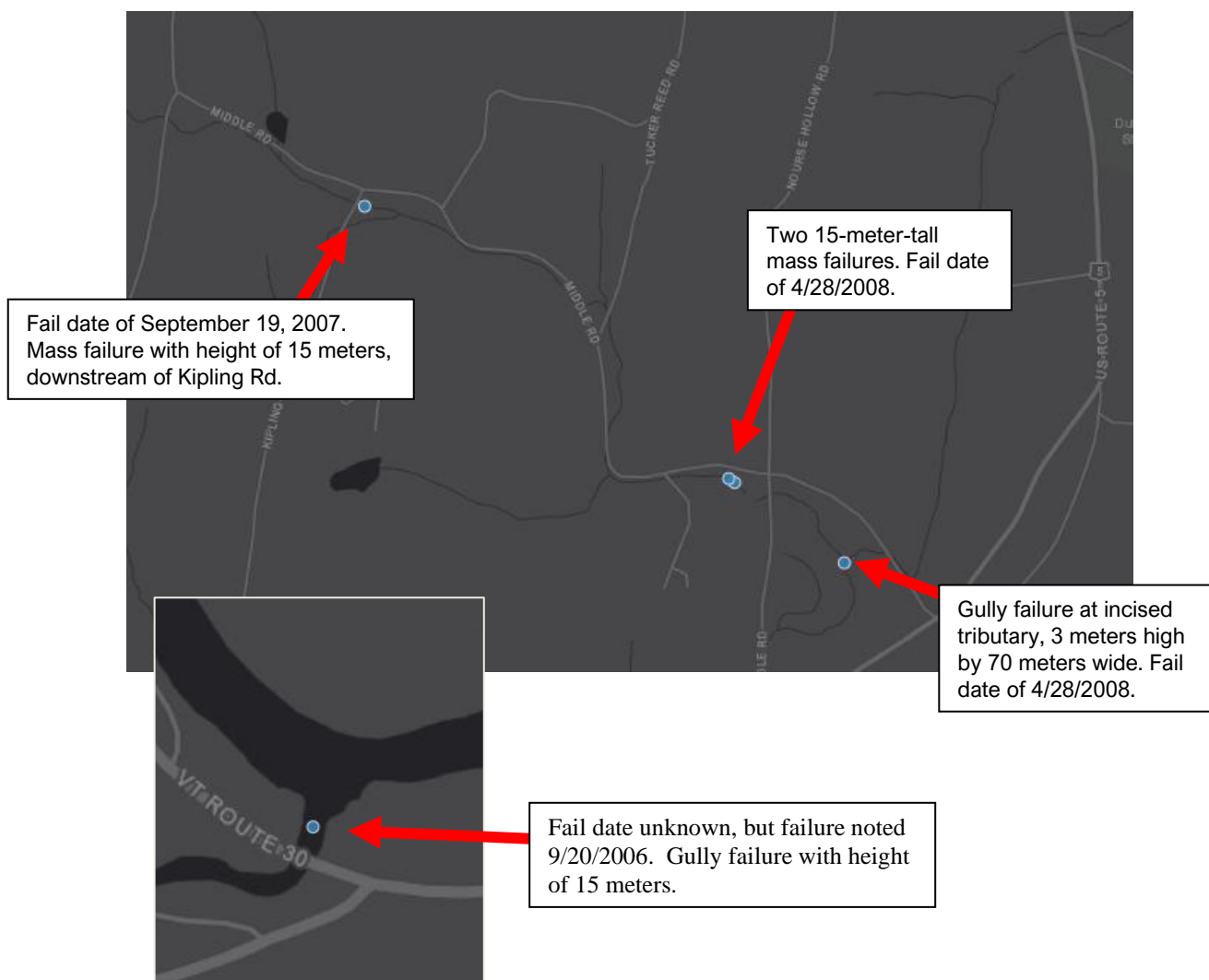
Infectious Disease Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Total population, especially older adults, young children, and those with underlying health conditions; critical facilities and services, healthcare providers, and schools	Statewide emergency declaration from March 13, 2020 to June 14, 2021 for COVID-19	54 deaths in Windham County, local outbreak, no published data on death counts at the municipal level, job loss, remote schooling, loss of business revenue, food insecurity; isolation	Score of 3; Probable future occurrence

Landslide

Landslides are a serious geologic hazard common to almost every state in the United States. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include: saturation by water, steepening of slopes by erosion or construction, alternate freezing or thawing, removal of trees and other vegetation and earthquake shaking. Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. As climate change leads to more intense precipitation events, landslides may become more frequent or active and more impactful to town assets. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Landslides in the Windham region are primarily related to the combination of road cutting into hillsides and fluvial erosion.

There are five mapped landslides in Dummerston on the Vermont ANR Landslide open-source data map¹⁹. Those are shown here:



¹⁹ <https://anrgeodata.vermont.gov/datasets/landslides/explore?location=43.155599%2C-72.516933%2C13.43>. Accessed 10/19/2021.

The largest area of landslide impact is another area, not included on the ANR landslide mapping. It is a stretch of land along Route 30 south of the Newfane town line. The slope, which is exposed rock in some areas, had become more active over time and in 2023 VTrans did a stabilization project which included caging some areas of slope to protect the roadway from falling debris. The area encompasses about 11.5 acres.



Landslide Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
6 areas discussed in this profile	Road infrastructure near impacted areas	11.5-acre area along Route 30 is the largest impacted area in town; VTrans has addressed this issue to prevent road danger	Slope failures and road-side washouts	Score of 2; Possible future occurrence

Mitigation Strategy

Goals of Mitigation

- Reduce the loss of life and injury resulting from all hazards.
- Reduce the impact of hazards on the town's water bodies, natural resources, and historic resources.
- Reduce the economic impacts from hazard events.
 - Minimize disruption to the road network and maintain access;
 - Mitigate financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters;
 - Ensure that community infrastructure is not significantly damaged by a hazard event; and
 - Be proactive in implementing any needed mitigation projects for public infrastructure such as roads, bridges, culverts, municipal buildings, etc.
- Encourage hazard mitigation planning to be incorporated into other community planning resources, such as the Town Plan, the Local Emergency Management Plan and the Structures Fund Capital Improvement Plan, and Town Basic Emergency Operation Plan.
- Ensure that members of the general public continue to be part of the hazard mitigation planning process.

The Goals listed here were reviewed in this update. Changes are shown in blue highlight. The Town's overall goals of this Plan remain the same since the last update.

Comparing the above Town goals with the below goals from the Draft State Hazard Mitigation Plan, they align in an overarching way.

Goals shown in the Draft 2023 Vermont State Hazard Mitigation Plan:

- Protect, restore, and enhance Vermont's natural resources to promote healthy, resilient ecosystems.
- Enhance the resilience of our built environment – our communities, infrastructure, buildings, and cultural assets.
- Develop and implement plans and policies that create resilient natural systems, built environments, and communities.
- Create a common understanding of – and coordinated approach to – mitigation planning and action.

Community Capabilities

Each community has a unique set of capabilities, including authorities, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. Dummerston's mitigation capabilities that reduce hazard impacts or that could be used to implement hazard mitigation activities are listed below.

➤ Administrative and Technical

In addition to the Emergency Management Services described in the Community Profile section, municipal staff that can be used for mitigation planning and to implement specific mitigation actions include: Town Clerk, Treasurer, 3 Listers, Assistant Town Clerk, 6-member Highway Department, Town Health Officer, and a part-time Zoning Administrator.

In addition to paid staff, there is a 5-member Selectboard, 8-member Planning Commission, 7-member Development Review Board, Tree Warden, Energy Committee, Conservation Commission, Social Services Advisory Committee, Dummerston Cares (not an official municipal committee), one volunteer Fire Department (with two stations) and several other town groups.

To augment local resources, the Town has formal mutual aid agreements for emergency response – fire and public works. Technical support is available through the WRC in the areas of land use planning, emergency management, transportation, GIS mapping, and grant writing. Technical support is also available through the State ANR for floodplain administration and VTtrans Districts for hydraulic analyses.

➤ Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Examples of planning capabilities that can either enable or inhibit mitigation include land use plans, capital budgeting programs, transportation plans, stormwater management plans, disaster recovery and reconstruction plans, and emergency preparedness and response plans. Examples of regulatory capabilities include the enforcement of zoning ordinances, subdivision regulations, and building codes that regulate how and where land is developed, and structures are built.

Town Plan: Adopted February 2018

Description: A framework and guide for how future growth and development should proceed.



2023 Vermont State Hazard Mitigation Plan

*Making Vermont safer and more resilient as we
prepare for climate change and natural disasters*



Plan Prepared by: Vermont Emergency Management

Relationship to Natural Hazard Mitigation Planning: Includes goals, policies, and action steps related to flood resilience. While this may not have been done in past updates, going forward there should be a distinct consideration of natural hazards in choosing sustainable areas intended for growth and expansion.

Zoning Bylaw with Flood Hazard Area and Riparian Area Requirements: adopted Sept. 2015; amended April 2022

Description: Provides for orderly community growth promoting the health, safety, and general welfare of the community.

Relationship to Natural Hazard Mitigation Planning: Establish site plan review requirements and zoning districts, including Flood Hazard and Riparian Area Overlay Districts, with specific standards for proposed development. Requirements are designed to prevent overdevelopment; to mitigate negative impacts to the natural and human environment; minimize effects to the historical and aesthetic character of the community; and ensure design and construction of development in flood and other hazard areas are accomplished in a manner that minimizes or eliminates the potential for flood loss or damage to life and property.

Road and Bridge Standards: Adopted Sept 2019

Description: Provide minimum codes and standards for construction, repair, maintenance of town roads and bridges.

Relationship to Natural Hazard Mitigation Planning: Standards include management practices and are designed to ensure safety of the traveling public, minimize damage to road infrastructure during flood events, and enhance water quality protections.

Road Erosion Inventory Report: last completed 2019

Description: Prioritizes those infrastructure projects necessary to improve transportation network resiliency and water quality.

Relationship to Natural Hazard Mitigation Planning: Improvements are designed to minimize or eliminate flood impacts on hydrologically connected road segments.

Local Emergency Management Plan: Adopted May 2023

Description: Establishes lines of responsibility and procedures to be implemented during a disaster and identifies high risk populations, hazard sites, and available resources.

Relationship to Natural Hazard Mitigation Planning: Includes actions for tracking events and response actions including damage reports to facilitate funding requests during recovery. This type of information can be essential to preparing hazard mitigation project applications for FEMA funding.

Fire Department ISO Rating: Issued in July 2022

Description: The West Dummerston Volunteer Fire Department's ISO rating is 9. This rating is a score from 1 to 10 that indicates how well-protected the community is by the local fire department.

Relationship to Natural Hazard Mitigation Planning: Everyone wants to keep family, home, and business safe from fires. The ISO rating is a measure of the effectiveness of a community's fire services.

Source Protection Plan: Adopted May 2021 (Brattleboro Water Department source wells are located in Dummerston)

Description: Defines the area of land that likely recharges a public drinking water source and addresses actions a public water system will perform to minimize the contaminant risks to the source(s).

Relationship to Natural Hazard Mitigation Planning: Source water protection can complement a broad sweep of community objectives, including protection of water quality, open space, natural systems, and disaster resilience.

➤ **Financial**

Financial capabilities are the resources that a community has access to or is eligible to use to fund mitigation actions.

Dummerston's current annual town budget is \$1,197,813, of which \$661,693 funds the Highway Department. Dummerston has not received FEMA grant funding for any mitigation projects, other than the update of this Plan.

The West Dummerston Volunteer Fire Department operates two fire houses and collects fees for the provision of fire protection. The Department's annual budget is \$154,748, of which approximately \$115,000 is for operations and the remainder as a contribution to capital for large purchase needs. The town historically funds approximately \$62,000 per year to the Department, and the Department fundraises the difference to meet their base budget with no capital purchases. The Department will not be able to maintain their ISO rating without greater funding support from the town budget. The Department's 10-year capital plan shows that current funding will not meet expected future needs. The Department under new leadership is trying to proactively set up a funding structure to maintain a high level of fire protection.

➤ **Education and Outreach**

Dummerston has several education and outreach opportunities that could be used to implement mitigation activities and communicate hazard-related information:

- Town website
- Dummerston Views community newsletter (paper and electronic)
- Front Porch Forum
- Dummerston Community Facebook Page
- Brattleboro Reformer (local newspaper)
- The Commons (local newspaper)
- Lydia Taft Pratt Library
- Dummerston Cares

NFIP Compliance

The Town joined the National Flood Insurance Program (NFIP) in 1991. The effective date of the current Flood Insurance Rate Map (FIRM) is September 28, 2007. The Zoning Administrator, acting as the Floodplain Administrator, enforces NFIP compliance through permit review requirements in the Flood Hazard Area regulations. The Floodplain Administrator reviews all development permit applications to determine if the property and/or building is located in any floodplain boundaries. If so, the Administrator reviews the application to ensure that all relevant regulations are proposed to be adhered to and does any needed inspections before working with the Development Review Board or issuing a permit. ANR has 30-days to review all applications in floodplain boundaries and may offer comment to the town. ANR review opportunity is required before the town can issue a permit, and serves as a second technical review of applications which can assist the town in deciding whether to issue or deny a permit.

Dummerston's regulations outline detailed minimum standards for development in FEMA Special Flood Hazard Areas. The town administers the NFIP minimum requirements related to substantial damage and substantial improvement thresholds. The Town works with the WRC and ANR to correct and prevent NFIP compliance issues through continuous communications, training and education.

The Town discussed the following as possible actions to continue NFIP compliance:

- Prepare, distribute, or make available NFIP insurance explanatory pamphlets or booklets.
- Participate in NFIP training offered by the State and/or FEMA.
- Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm.

State Incentives for Flood Mitigation

Vermont's Emergency Relief Assistance Funding (ERAF) provides state funding to match FEMA Public Assistance after federally declared disasters. Eligible public costs are generally reimbursed by FEMA at 75% with the State matching 7.5%. The State will increase its match to 12.5% or 17.5% of the total cost if communities take steps to reduce flood risk as described below.

12.5% funding for eligible communities that have adopted four (4) mitigation measures:

1. NFIP participation
2. Town Road and Bridge Standards
3. Local Emergency Plan
4. Local Hazard Mitigation Plan

17.5% funding is available if a community does either or both of these enhanced mitigation measures:

1. Regulates development in ANR mapped River Corridors
2. Joins FEMA's Community Rating System

Dummerston's current ERAF rate is 12.5% because they have in place all four base mitigation measures.

Identification of Mitigation Actions

The Planning Team discussed the mitigation strategy, reviewed projects from the 2017 Plan, and identified possible new actions from the following categories for each of the high scoring natural hazards identified in the Risk Assessment.

1. **Local Plans and Regulations:** These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
2. **Structure and Infrastructure Projects:** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This applies to public or private structures as well as critical facilities. These projects may be eligible for funding through FEMA's Hazard Mitigation Funding Programs.
3. **Natural Systems Protection:** These actions minimize damage and losses and preserve or restore the functions of natural systems.
4. **Education and Awareness Programs:** These actions inform and educate the public about hazards and potential ways to mitigate them. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. Greater understanding and awareness are more likely to lead to community support for direct actions.

For the selected actions, the Planning Team assigned a responsible party to lead the implementation of each action; identified potential funding; and developed a timeframe for implementation.

MITIGATION IN ACTION

Local Plans and Regulations

	HAZARD(S) ADDRESS- ED	ISSUE/ CONCERN	ACTION DESCRIPTION / CURRENT STATUS	RESPON- SIBLE ENTITIES (Lead party in bold)	TIME- FRAME	POTENTIAL FUNDING	Community Lifeline Connection Y/N	MITIGATION / PREPARED- NESS / PREVENTION / MAINTENANCE

1	All Hazards	Paper records are vulnerable to destruction by a variety of hazards	Digitizing the town records (covering 50 years) is a goal of the town to ensure their perpetuity.	Town Clerk	by 2032	Town funds	N	Mitigation / Prevention
2	Flooding / Fluvial Erosion	Floodplain administration is complicated and training is needed. Regulations change quickly.	Further training for the Floodplain Administrator (FEMA EMI class, online STARR classes, etc.)	Floodplain Administrator	Ongoing	Town funds	Y	Preparedness / Maintenance / Prevention
3	Flooding / Fluvial Erosion	The SFHA bylaw will need to be updated with coming new FEMA FIRMs; adding River Corridors during that update is recommended.	Regulation of River Corridors added to the Zoning bylaw	Planning Commission	By the end of 2025	Town funds / WRC support	N	Mitigation / Prevention
4	Flooding / Fluvial Erosion	Structures fund is yearly based on what's available and the amount set aside is at the discretion of the Selectboard. This fund needs to be strategically invested in so that there is set aside when needed for larger projects.	Increase funding in the Structures Fund for future unexpected project and bridge replacements; Increased budget item in the yearly budget	Select-board	Budget 2023	Structures Fund	Y	Preparedness / Mitigation
5	Heat	Planning for how to assist residents during high heat events is needed.	Develop hot weather annex to the LEMP.	EMD	By the end of 2025	Town funds / WRC support	Y	Preparedness / Mitigation
Structure and Infrastructure Projects								
	HAZARD(S) ADDRESS-ED	ISSUE/ CONCERN	ACTION DESCRIPTION / CURRENT STATUS	RESPON-SIBLE ENTITIES (Lead party in bold)	TIME-FRAME	POTENTIAL FUNDING	Community Lifeline Connection Y/N	MITIGATION / PREPARED-NESS / PREVENTION / MAINTENANCE
6	Flooding / Fluvial Erosion	Now #1 priority; This structure causes the worst washout damage of all the structures in town when it washes out.	Park Laughton Road (structure b-11) – old boiler tube to be upgraded to a 6'x20' concrete bridge	Road Crew with Contractor support	Start and finish Summer 2024	VTrans Structures Grant; or FEMA BRIC or HMGP	Y	Mitigation

7	Flooding / Fluvial Erosion		Leonard Road – old boiler tube structure to be up-graded to 12x6x40' box culvert	Road Crew with Contractor support	Start and finish Summer 2026	VTrans Structures Grant	Y	Mitigation
8	Flooding / Fluvial Erosion	Undersized structure	Greenhoe Road structure b-5 - culvert that needs to be replaced with bridge - 30' wide by 20' long bridge likely - hydraulic study needs to be ordered	Road Crew with Contractor support	2028	VTrans Structures Grant	Y	Mitigation
9	Flooding / Fluvial Erosion	hydraulic study recommended a 16' wide and 12' high by 110' long structure	Secure funding for structure upgrade. Johnson's Curve Road - this is a box culvert and it's poured on ledge and it is getting undermined within it; replacement would be to state standards; this structure is 30' down from the road level and 100' long. This would be a two-year project. There is a stream that goes through it, and it's so long because of the stream. lifespan is 10 years more.	Road Crew with Contractor support	2030 construction goal; within this plan cycle and by 2029 secure funding.	VTrans Structures Grant	Y	Mitigation
10	Flooding / Fluvial Erosion	Undersized structure	Camp Arden Road (structure b-15) – old boiler tube to be upgraded to a 12' wide box culvert	Road Crew with Contractor support	Start and finish Summer 2032; Secure funding within the next five years.	VTrans Structures Grant	Y	Mitigation
11	Flooding / Fluvial Erosion	Undersized structure	Beaver Pond Road (structure 8) – old boiler tube to be upgraded to an 8' wide box culvert	Road Crew with Contractor support	Start and finish Summer 2035; Secure funding within the next five years.	VTrans Structures Grant	Y	Mitigation
12	Flooding / Fluvial Erosion	Undersized structure	Kipling Road (structure b-1) – old 6' boiler tube to be upgraded to a 14'	Road Crew with Contractor support	Start and finish Summer 2040;	VTrans Structures Grant	Y	Mitigation

			multi-plate arch culvert		Secure funding within the next five years.			
13	Fluvial erosion / Flooding	There is not easy access to the active railway line for emergency responders. The railway is in close proximity to the CT river and tributaries. Fire protection of the train tracks is important.	Purchase off-road ATV equipment to increase ease of access to the Rail bed. Long term the goal would be to have better access route created for larger vehicles, but in the meantime having equipment to access the rail line is needed.	Fire Chief and members	2029 or as soon as funding is available	AFG / Fire Department funding	Y	Preparedness
14	All Hazards	Currently there is no road access to I-91 within Dummerston. Dummerston FD relies on mutual aid for quicker response times to emergency calls in on I-91 in Dummerston.	Add an emergency on-ramp from Dummerston Station Road to I-91. Town wants to be able to have access point in their town for emergency vehicles.	Fire Chief , support from VTrans and WRC	2028 or as soon as funding is available	State and Federal grants, VTrans, AOT, Town funding	Y	Preparedness
Natural Systems Protection and Nature-based Solutions								
	HAZARD(S) ADDRESS-ED	ISSUE/ CONCERN	ACTION DESCRIPTION / CURRENT STATUS	RESPON-SIBLE ENTITIES (Lead party in bold)	TIME-FRAME	POTENTIAL FUNDING	Community Lifeline Connection Y/N	MITIGATION / PREPARED-NESS / PREVENTION / MAINTENANCE
15	Flooding / Fluvial Erosion	Stone line ditching has helped a lot with road washouts; the town is prioritizing the worst spots. This also helps keep sediment out of streams and in this way improves water quality.	Complete stone line ditching - this has been going on for 6 years and will take another 6 years - this is an ongoing action. Ditches that have been completed have less washout damage.	Road Crew	ongoing process that is underway	Grants in Aid	Y	Preparedness / Prevention / Maintenance

16	Invasive Species	The CC currently does annual removals, but wants to improve attendance and increase frequency of events. They also want to educate themselves to improve strategy of removal and disposal.	Improve outreach efforts and contact interested people within Dummerston and surrounding towns. Occasionally bring in experts to educate the group.	Dummerston Conservation Commission	Hold events in spring and fall starting in 2024, when invasives are easier to spot	Fundraising and town funds	N	Mitigation / Prevention / Maintenance
17	Invasive species / High wind / Ice	Vulnerable trees near power lines is a leading cause of power outages.	Replace ash trees and any unhealthy trees with lower growing trees along power lines.	GMP and Dummerston Conservation Commission	Within the 5-year planning cycle	GMP and town funds	Y	Mitigation / Prevention / Maintenance
18	Flooding and Fluvial Erosion		Actions identified in Crosby Brook Corridor Plan, and below on pages 52-53	Varies	Within the 5-year planning cycle	Noted in the Plan table	N	Mitigation / Prevention / Maintenance
Education and Awareness Programs								
	HAZARD(S) ADDRESS-ED	ISSUE/ CONCERN	ACTION DESCRIPTION / CURRENT STATUS	RESPONSIBLE ENTITIES (Lead party in bold)	TIME-FRAME	POTENTIAL FUNDING	Community Lifeline Connection Y/N	MITIGATION / PREPAREDNESS / PREVENTION / MAINTENANCE
19	Flooding / Fluvial Erosion and Invasive Species	It's been a while since the CC provided education around invasives, so it's something that they'd like to address more regularly.	On a bi-yearly schedule, provide educational programming around protecting and enhancing riparian buffers on their property.	Dummerston Conservation Commission	Starting in 2024 and continuing bi-annually, with video of programs available online	CC annual budget funds and donations	N	Preparedness / Prevention
20	Extreme cold / Ice / Snow / Wind / Flooding / Fluvial Erosion	Improper generator use is preventable with little training.	Education on safe use of generators.	EMD and Fire Chief	By the end of 2025	Town funds	Y	Preparedness / Prevention

21	All Hazards	Awareness of hazards including: flooding, fluvial erosion, ice jams, ice, snow, high wind, heat, drought, cold, and landslides.	Update the EM page on the town website to house emergency related educational materials, including a list of items to have in case of emergency.	EMD and Town Website Administrator	By the end of 2026	Town funds	Y	Preparedness / Prevention
22	All Hazards	EMD needs to be able to communicate with residents during all hazard events.	EMD will work with VEM to understand VTAAlert sign-up rate in town and make flyers available on TMD	EMD	TMD 2025	Town funds	Y	Preparedness
23	Invasive Species	This action was carried over from the prior plan.	Conservation Commission to have a workshop about deer overpopulation and encourage new hunters. This is in the planning stages now.	Dummerston Conservation Commission	To be held Fall 2018	Fundraising and town funds	N	Maintenance / Prevention
24	All Hazards / Infectious Disease Outbreak	Dummerston is part of a new communications union district. Expanding access to high-speed internet is of benefit to all residents and increases ability to function in isolation, if needed	Support DV Fiber in expanding fiber lines to underserved or not served areas of Dummerston	DVFiber Board (2 reps from Dummerston)	2026	ARPA funding	Y	Preparedness / Prevention
25	Flooding	More flooding events have caused life threatening situations and highlight the need for more swift water rescuers.	Training of multiple Fire Department members for swift water rescue.	Fire Chief and members	by 2026	Funded through Rescue Inc.	Y	Preparedness
26	All Hazards	Emergency response communication equipment is inadequate due to difficult topography. There are times when current equipment does not work.	Replacement of all radio equipment with the current P25 compliant radio; this will bring improved range, sound quality and ability to connect with other response agencies.	Fire Chief and members	all radios upgraded by 2025, with successful AFG award; 2029 if self-funded	Regional grant through AFG 23	Y	Preparedness / Response

27	All Hazards	Portable radios are limited without repeaters.	Installation of repeaters in each fire engine; this would increase range of portable radios to that of mobile radio sets.	Fire Chief and members	10-year plan; by 2034	Fire Department funding	Y	Preparedness / Response
----	-------------	--	---	------------------------	-----------------------	-------------------------	---	-------------------------

Mitigation Action Evaluation

For each mitigation action identified above, the Hazard Mitigation Planning Team evaluated its potential benefits and/or likelihood of successful implementation. Each action was evaluated against a broad range of criteria, including a planning level assessment of whether the costs are reasonable compared to the probable benefits. Results of this evaluation are presented in the table below.

Note that the Town will make every effort to maximize use of future Public Assistance Section 406 Mitigation opportunities when available during federally declared disasters.

Action Evaluation Criteria:

- Life Safety – How effective will the action be at protecting lives and preventing injuries?
- Property Protection – How effective will the action be at eliminating or reducing damage to structures and infrastructure?
- Technical – Is the mitigation action a long-term, technically feasible solution?
- Political – Is there overall public support/political will for the action?
- Administrative – Does the community have the administrative capacity to implement the action?
- Other Community Objectives – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation?

Each of the above criteria is ranked with a -1, 0, or 1 using the following table:

1= Highly effective or feasible

0 = Neutral

-1 = Ineffective or not feasible

Estimated Cost:

1 = less than \$50,000;

2 = \$50,000 to \$100,000;

3 = more than \$100,000

C/B – Are the costs reasonable compared to the probable benefits? Yes or No

MITIGATION ACTION EVALUATION AND PRIORITIZATION										
Local Plans and Regulations										
ID	ACTION DESCRIPTION	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
1	Digitizing the town records (covering 50 years) is a goal of the town to ensure their perpetuity.	0	0	1	1	1	0	3	1	Yes
2	Further training for the Floodplain Administrator (FEMA EMI class, online STARR classes, etc.)	1	1	1	0	1	0	4	1	Yes

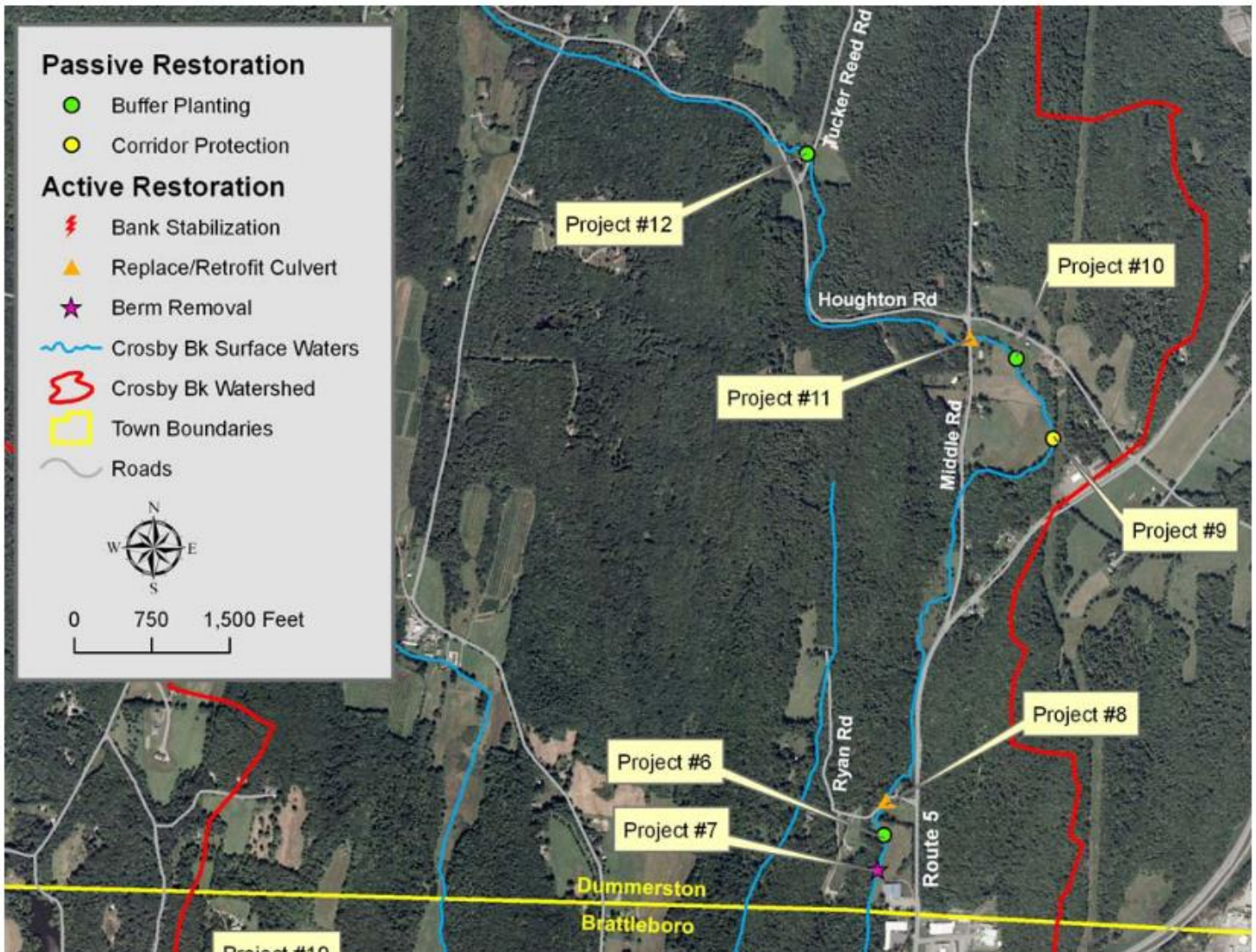
3	Regulation of River Corridors added to the Zoning bylaw	1	1	1	0	1	0	4	1	Yes
4	Increase funding in the Structures Fund for future unexpected project and bridge replacements; Increased budget item in the yearly budget	1	1	1	0	1	1	5	2	Yes
5	Develop hot weather annex to the LEMP.	1	0	0	1	0	1	3	1	Yes
Structure and Infrastructure Projects										
	ACTION DESCRIPTION	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
6	Park Laughton Road (structure b-11) – old boiler tube to be upgraded to a 6'x20' concrete bridge	0	1	1	1	1	0	4	3	Yes
7	Leonard Road – old boiler tube structure to be upgraded to 12x6x40' box culvert	0	1	1	1	1	0	4	3	Yes
8	Greenhoe Road structure b-5 - culvert that needs to be replaced with bridge - 30' wide by 20' long bridge likely - hydraulic study needs to be ordered	0	0	1	1	1	0	3	3	Yes
9	Secure funding for structure upgrade. Johnson's Curve Road - this is a box culvert and it's poured on ledge and it is getting undermined within it; replacement would be to state standards; this structure is 30' down from the road level and 100' long. This would be a two-year project. There is a stream that goes through it, and it's so long because of the stream. lifespan is 10 years more.	0	1	1	1	1	0	4	3	Yes
10	Camp Arden Road (structure b-15) – old boiler tube to be upgraded to a 12' wide box culvert	0	1	1	1	1	0	4	3	Yes

11	Beaver Pond Road (structure 8) – old boiler tube to be upgraded to an 8' wide box culvert	0	0	1	1	1	0	3	3	Yes
12	Kipling Road (structure b-1) – old 6' boiler tube to be upgraded to a 14' multi-plate arch culvert	0	0	1	1	1	0	3	3	Yes
13	Purchase off-road ATV equipment to increase ease of access to the Rail bed. Long term the goal would be to have better access route created for larger vehicles, but in the meantime having equipment to access the rail line is needed.	1	1	1	0	1	1	5	2	Yes
14	Add an emergency on-ramp from Dummerston Station Road to I-91. Town wants to be able to have access point in their town for emergency vehicles.	1	1	1	1	0	0	4	3	Yes
Natural Systems Protection and Nature-based Solutions										
	ACTION DESCRIPTION	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
15	Complete stone line ditching - this has been going on for 6 years and will take another 6 years - this is an ongoing action. Ditches that have been completed have less washout damage.	0	1	1	1	1	0	4	3	Yes
16	Improve outreach efforts and contact interested people within Dummerston and surrounding towns. Occasionally bring in experts to educate the group.	0	1	1	1	0	1	4	1	Yes
17	Replace ash trees and any unhealthy trees with lower growing trees along power lines.	1	1	1	0	0	1	4	2	Yes
18	Actions identified in Crosby Brook Corridor Plan, on pages 52-53	0	1	1	0	0	1	3	2	Yes
Education and Awareness Programs										

	ACTION DESCRIPTION	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
19	On a bi-yearly schedule, provide educational programming around protecting and enhancing riparian buffers on their property.	0	1	1	1	0	0	3	1	Yes
20	Education on safe use of generators.	1	1	1	0	0	1	4	1	Yes
21	Update the EM page on the town website to house emergency related educational materials, including a list of items to have in case of emergency.	0	0	1	1	1	1	4	1	Yes
22	EMD will work with VEM to understand VTAlert sign-up rate in town and make flyers available on TMD	1	0	1	1	0	0	3	1	Yes
23	Conservation Commission to have a workshop about deer overpopulation and encourage new hunters. This is in the planning stages now.	0	1	0	0	0	0	1	1	Yes
24	Support DV Fiber in expanding fiber lines to underserved or not served areas of Dummerston	1	0	1	1	0	1	4	1	Yes
25	Training of multiple Fire Department members for swift water rescue.	1	0	0	0	0	1	2	1	Yes
26	Replacement of all radio equipment with the current P25 compliant radio; this will bring improved range, sound quality and ability to connect with other response agencies.	1	1	1	0	0	1	4	3	Yes
27	Installation of repeaters in each fire engine; this would increase range of portable radios to that of mobile radio sets.	1	1	1	0	0	1	4	3	Yes

Crosby Brook Stream Corridor Restoration Plan Actions

The following actions have been identified in the *Crosby Brook Stream Corridor Restoration Plan*. The *Corridor Restoration Plan* was completed in 2009 by the consultant Fitzgerald Environmental Associates. The *Corridor Restoration Plan* identifies specific improvement projects that are mapped and listed in a table below. The below and table were taken directly from the *Corridor Restoration Plan*, and thus align with their organizational methodology. The 'Potential Partners/Programs' category of the table speaks to responsible entity and potential funding sources. Dummerston will aim to implement these actions within the next five years.



Project #, Reach, Stream Type, CEM [†] , RGA/RHA	Site Description and Importance, Including Stressors and Constraints	Project Type and Strategy	Priority, Technical Feasibility & Relative Costs	Other Social Benefits	Potential Partners
#6 M03, C, III, Fair/Fair	Upper section of reach has limited riparian buffer along the left bank where a historical hay/pasture area is now meadow.	Passive Restoration Plant stream buffer along left bank for ~600 ft to encourage long-term restoration of upper reach as it regains equilibrium conditions.	Moderate priority Single parcel for site. Planting should be completed in conjunction with corridor protection. Relatively low cost for native plant materials and labor.	Improved biotic habitat through increased shading and input of coarse woody debris and organic matter.	WCNRCD; VYCC; Town of Dummerston
#7 M03, C, III, Fair/Fair	See above for general reach description. Upper section of reach has limited floodplain access due to a berm that extends ~350 ft along the left bank. Additional armoring and channel incision noted along berm.	Active Restoration Remove berm to increase floodplain access along left bank where no development exists currently. Enhance adjacent floodplain wetlands.	Low priority Done in conjunction with the corridor protection and riparian buffer plantings noted above. Feasibility depends on landowner willingness (1 parcel). Relatively high costs due to excavation work and design fees.	Further protection of water quality in downstream reaches. Wildlife habitat conservation and restoration additional benefit with enhanced wetlands.	WCNRCD; VTDEC
#8 M03, C, III, Fair/Fair	See above for general reach description. Ryan Road culvert is not compatible with geomorphic stability and has no aquatic organism passage. Crossing creates a discontinuity in habitat from upstream to downstream reaches.	Active Restoration Replace structure with adequately-sized culvert or bridge that accommodates 100% of bankfull channel width (24 ft).	High priority If restoration of native trout fishery is a restoration goal. Relatively high costs due to change in channel slope at structure. Alternative could be construction of weirs at outlet to improve fish passage.	Improved biotic habitat and enhancement of trout fishery in upper reaches.	WCNRCD; Town of Dummerston
#9 M05, C, IV, Good/Fair	Channel historically straightened against valley wall. Some evidence of terraces noted in middle and upper reach. Channel has redeveloped some sinuosity in lower and middle reach. Large gully and mass failure present along left bank mid-reach.	Passive Restoration Corridor protection through conservation easements. Corridor is currently undeveloped and adjusting towards equilibrium conditions.	Low priority Important sediment attenuation asset reach. High loss of local wetlands. Three parcels occupy the corridor. Relatively high costs for conservation due to productive agricultural lands.	Further protection of water quality in downstream reaches. Wildlife habitat conservation an additional benefit.	WCNRCD; Town of Dummerston; Landowner
#10 M05, C, IV, Good/Fair	See above for general reach description. Upper and lower sections of reach has limited riparian buffer where a historical hay/pasture area is now meadow. Planting area spans three (3) parcels.	Passive Restoration Plant stream buffer in 2 areas of reach: 1) along right bank for ~100 ft in lower reach just above reach break where bank erosion is occurring. 2) along both banks for ~600ft in upper reach from Middle Rd crossing downstream.	Moderate priority Long stretches of stream without cover that likely leads to increased stream temperatures. Relatively low cost for native plant materials and labor.	Improved biotic habitat through increased shading and input of coarse woody debris and organic matter.	WCNRCD; VYCC; Landowner
#11 M06-A, C, II, Fair/Good	See above general segment description. Culvert beneath Middle Road in lower reach is incompatible with geomorphic stability and has no aquatic organism passage.	Active Restoration Replace structure with adequately-sized culvert or bridge that accommodates 100% of bankfull channel width (24 ft).	Moderate priority If restoration of native trout fishery is a restoration goal. Relatively high costs due to change in channel slope at structure. Alternative could be construction of weirs at outlet to improve fish passage.	Improved biotic habitat and enhancement of trout fishery in upper reaches.	WCNRCD; Town of Dummerston
#12 M06-C, C, I, Good/Good	Immediately upstream of the Tucker Reed Road crossing are direct channel impacts associated with a residence on the right bank. Lack of woody buffer vegetation is causing bank erosion on the right bank.	Passive Restoration Plant riparian buffer on right bank upstream of Tucker Reed Road.	Moderate priority Achievable buffer planting due to relatively low costs for implementation.	Improved biotic habitat through increased shading and input of coarse woody debris and organic matter.	VYCC

Incorporating Mitigation into Other Local Planning Mechanisms

As part of the planning process, local planning mechanisms were reviewed for how well they consider and incorporate the mitigation goals of the town. Areas of improvement should be considered when each of these planning tools is updated. The more that tools can align and reflect each other, the more effective the town can be in consideration of hazard mitigation when making choices and decisions. There is no timeframe set for updating the below referenced plans and regulations, however, as each document is updated the hazard mitigation plan will be reviewed for incorporation. The goals of this hazard mitigation plan will be incorporated in the upcoming town plan update to ensure that emergency preparedness and

mitigation planning efforts are considered, with particular attention to furthering the projects in the Mitigation Actions Table herein.

Plans and Studies

Capability	Description	Improvement Opportunity
<i>Town Plan</i>	Plan for coordinated town-wide planning for land use, municipal facilities, etc.	Town Plan was adopted in 2017 and an update is in process. A comprehensive integration of the Local Hazard Mitigation Plan should occur with updates of the Town Plan.
<i>Local Hazard Mitigation Plan (LHMP)</i>	Plan that identifies hazards in community and proposes actions to reduce or eliminate risk to people, property, and the natural environment.	Plan has a 5-year lifespan. Maintaining an up-to-date plan keeps the town eligible for FEMA mitigation grant funding. Review yearly and reference when updating Town Plan.
<i>Stormwater Plan</i>	Plan that identifies stormwater improvements for municipal roads.	Town received a General Permit to discharge stormwater from municipal roads
<i>Local Emergency Management Plan (LEMP)</i>	Municipal procedures for emergency response.	Updated yearly. The goal is to complete all LEMP appendices.
<i>Invasive Species Management Plan</i>	Plan that provides guidance on effective management of invasive species.	This has not been done and should be completed.
<i>Culvert Inventory</i>	An inventory of the size, material, condition and location of culverts. Updated annually by Public Works Department.	None identified. Culvert Inventory last updated in 2019.
<i>School Emergency Response Protocol</i>	School procedures for emergency response	None identified

Administrative Capacity and Capability

Capability	Description	Improvement Opportunity
<i>Emergency Management Director</i>	Prepares plans and procedures for responding to natural disasters other emergencies and leads response efforts.	None identified
<i>Planning Commission</i>	Municipal body responsible for planning for the community, including maintaining the town plan, zoning bylaws, and subdivision regulations.	More members would be good.
<i>Development Review Board</i>	Municipal body responsible for evaluating and deciding on proposed development.	More members would be good.
<i>Zoning Administrator</i>	Administrative officer responsible for administering zoning bylaws.	None identified.
<i>Tree Warden</i>	Responsible for trees on public property, including town properties, schools, and within public right-of-way.	None identified.
<i>Selectboard</i>	Legislative body of the town for all purposes required by the state.	None identified.

<i>Mutual Aid Agreements – Emergency Services</i>	Agreement for regional coordinated emergency services.	None identified. SWNH Dispatch for fire and rescue dispatch – written agreement/contract; Contract part-time with the County Sheriffs Dept; State police are backup
<i>Mutual Aid Agreements – Public Works</i>	Agreement for regional coordinated emergency highway maintenance services.	None identified. Recommended to formalize agreements with adjacent towns.
<i>VEM Training</i>	Training provided by state to ensure emergency responders are adequately prepared to respond to emergency incidents.	Identified as an action item in LHMP
<i>Highway Department</i>	Municipal department responsible for overseeing all aspects of municipal road network, including maintenance and construction.	None identified
<i>Town Clerk & Treasurer</i>	Responsible for receiving and recording town archives, recording deeds, filing vital statistics information, running treasury.	None identified

Financial Resources

Capability	Description	Improvement Opportunity
<i>Town Budget</i>	Annual municipal operating budget, approved at Town Meeting	Town has a goal of contributing to a Structures fund to pay for mitigation projects, but there is no set annual commitment to do that.
<i>Taxing Authority</i>	Ability to assess and collect property taxes.	None identified

Zoning and Regulations

Capability	Description	Improvement Opportunity
<i>National Flood Insurance Program (NFIP)</i>	Provides ability for residents to acquire flood insurance.	None identified. Member in good standing.
<i>SFHA bylaws</i>	Regulates development in FEMA identified SFHAs.	Date from 2022; riparian areas are discussed; article 4 is SFHA regulations. Consider including River Corridor regulations in next update.
<i>Zoning</i>	Regulates the development and division of land, standards for site access and utilities	None identified
<i>Building codes</i>	Codes for fire and building safety are in place for multifamily structures and are regulated by the Division of Fire Safety. There are also Statewide Standards for Energy Efficiency and Electrical Safety for buildings.	None identified.
<i>Road Standards</i>	Design and construction standards for roads and drainage systems.	None identified. State road and bridge standards adopted.
<i>Wetland Protections</i>	Protection of environment, water resources, wildlife, biota. Protected by 1990 Vermont Wetland Rules	None identified.

<i>River Corridor bylaws</i>	Regulates development in River Corridors as identified by Vermont ANR.	Consider including River Corridor bylaws in zoning bylaws.
<i>Sewage Regulations</i>	Regulates on-site sewage systems.	None identified. Governed by state sewage regulations.

Outreach and Education

Capability	Description	Improvement Opportunity
<i>Town Website</i>	Municipal website providing relevant information to residents and businesses about public meetings, resources, etc.	None identified.

PLAN MAINTENANCE PROCESS

Yearly Review and Plan Monitoring

Once the plan is approved and adopted, the Emergency Management Director, along with interested and appointed volunteers and stakeholders, will work with the Windham Regional Commission (WRC) or a private consultant to monitor, evaluate, and update the plan throughout the next 5-year cycle. The plan will be reviewed annually after Town Meeting Day at a Selectboard meeting in conjunction with the review of the town's Local Emergency Management Plan (LEMP). This meeting will allow town officials and the public to discuss the town's progress in implementing mitigation actions and determine if the town is interested in applying for grant funding for projects. In addition to tracking progress in implementing the plan, the EMD will lead town officials in evaluating the effectiveness of the plan in meeting plan goals and reducing vulnerability. WRC will assist with this review if requested by the Town. The plan evaluation will address:

- Progress in implementation of plan actions and goals.
- Discuss the effect of completed mitigation actions and their impact on vulnerability.
- Evaluation of unanticipated challenges or opportunities and their effect on capabilities of the town.
- Evaluation of hazard-related public policies, initiatives and projects.
- How mitigation strategy has been incorporated into other planning mechanisms
- The effectiveness of public and private sector coordination and cooperation.

Progress on actions will be kept track using a "mitigation action tracking table" or another monitoring tool of the Town's choice. There will be no changes to the plan unless deemed necessary by the Town, and if so, the post disaster review procedure will be followed.

Five-Year Update Process

Hazard mitigation planning is dynamic with changes in land use, changes caused by events, and the effects of climate change. To ensure that the Town maintains a current and relevant LHMP, it is important that it undergo a major update periodically as required in 44 CFR § 201.6(c)(4)(i). This update process will be thorough and occur at least every five years, and will include an evaluation, incorporate any new requirements that FEMA has set, and account for changes in the Town. To ensure funding for this comprehensive update, the Town should be applying for FEMA funding at the 2½ year point. Awarded grants can be put out to bid using the Town's procurement rules and a Consultant hired to assist with the following procedure²⁰:

²⁰ Towns can also choose to use funding in-house to develop their LHMP without outside assistance.

1. The Emergency Management Director (EMD) will gather a team to serve as the Planning Team. Members may include: Selectboard members, Fire Chief and fire personnel, Zoning/Floodplain Administrator, Constable or Police Chief, Road Commissioner/Foreman, Planning Commission members, Town Health Officer, prominent business owners, longtime residents, impacted residents, and any interested stakeholders, etc.
2. The Consultant will guide the Team through the evaluation and update processes. These processes will include advertised public meetings. The update will address:
 - Incorporating hazard events that have occurred since the last plan update.
 - Changes in community and government processes which impact hazard response.
 - Community growth and development trends and their impact on vulnerability.
 - Incorporation of new mitigation actions and goals.
 - Impacts of climate change on the locality.
3. From the information gathered, along with data collected, the Consultant will prepare the updated draft in conformance with the latest *Local Mitigation Plan Review Tool* and *Local Mitigation Planning Policy Guide* developed by FEMA.
4. The Town will have a chance for an internal review of the draft Plan update and changes will be incorporated. Emphasis in plan updates will be put on critically looking at how the plan can become more effective at achieving actions and meeting goals.
5. The draft Plan will then be made available for public comment and advertised locally. The draft Plan will simultaneously be distributed for review and comment to adjacent towns and entities serving vulnerable populations within the town or regionally. Comments will be addressed and a final draft will be developed.
6. The final draft Plan will be provided to Vermont Emergency Management (VEM) for their review. Any received comments that need addressed for Plan compliance will be addressed and revised draft submitted back to VEM.
7. Once VEM designates the Plan 'approved pending adoption' the Consultant will inform the Town that the Plan is ready for adoption. The adopted Plan will be submitted to VEM and FEMA. FEMA will issue notice of 'final approval' and set the date that an updated LHMP needs to be complete in order to maintain having a compliant plan in place.

Post-Disaster Review/Update Procedure

Should a significant disaster event occur, a special review by the town's Planning Team should occur in regards to the LHMP within 6-months of the event. This review will serve to document the facts of the event and assess whether completed mitigation actions effectively lessened town damages. Newly needed mitigation projects will be discussed and placed on the town's mitigation action tracking sheet to ensure they are considered for the next plan update and/or pursued prior. An 'After-Action Report' will be distributed to the Team to the Selectboard for their awareness. The Report should note whether the Plan needs to be amended. If the Team determines that modification of the plan is needed, then the Team drafts an amended Plan based on the recommendations. VEM can be consulted for guidance during this process. The amended plan will need to be re-reviewed and adopted as in the Plan update process discussed above.

Ongoing Public Participation

Maintenance of this Plan and support on the implementation of the stated mitigation actions is a smooth process when there is continued participation of community members. To keep the public engaged in hazard mitigation efforts, the Town proposes to do the following:

- Provide engaging hazard mitigation information at Town Meeting, including education about individual and family resiliency measures.
- Yearly review and tracking of progress on mitigation actions using a tracking tool. This should be done at a Planning Commission or Selectboard public meeting and with the participation of Team members that helped in Plan development.
- Post the Plan on the town website for public access and share pertinent hazard related information on the Town website, Town sponsored social media, and at local public notice locations.

This Plan is a tool to promote hazard mitigation discussions with the goal of leading to actions that increase resiliency and lessen or eliminate hazard impacts.

APPENDIX

1. Mitigation Action Tracker
2. Update on Mitigation Actions identified in the prior Hazard Mitigation Plan
3. December 13, 2021 Meeting flyer and agenda
4. November 16, 2023 Meeting sign-in sheet (part of advertised Selectboard meeting)
5. Town email sent from the Town Clerk to all Town newsletter recipients
6. Email sent to adjacent towns for comment on the draft plan
7. Email sent to frontline organizations for comment on the draft plan
8. Flyer advertising availability of Draft Hazard Mitigation Plan for public comment
9. Public and Town comments received

1. Mitigation Action Tracker

2. Update on Mitigation Actions identified in the prior Hazard Mitigation Plan

Below is an update on mitigation actions listed in the 2015 Dummerston Local Hazard Mitigation Plan. The planning participants reviewed these actions and provided an update to WRC at the outset of the Plan update process. Current status is listed here in the last column, and prioritization changes are called out where applicable. Changes in priority are reflected throughout the Plan and in the prioritization of new actions identified.

	Action	Responsible Party	Project Priority	Current Status
1	Create a group within VTAAlert, specific to residents/businesses within the SFHA and around transportation corridors in case of a hazardous material spill.	EMD	High	EMD has been trained in VTAAlert, but needs updated training.
2	Further training for the Floodplain Administrator (FEMA EMI class, online STARR classes, etc.)	Floodplain Administrator	High	The FPA has not received training since the last plan update; but he is interested in doing so.
3	Stickney Brook Road (structure b-53) – old 66” x 35’ boiler tube structure is rusted out and needs to be upgraded to 12x6x40’ box culvert	Road Crew and Contractors	High	Completed
4	Setting up a volunteer team to do specific removal tasks.	Dummerston Conservation Commission	High	The Commission has members that do removal work; there is no set team, though, and more volunteers are desired.
5	Conservation Commission to host an annual month long workshop series.	Dummerston Conservation Commission	High	Monthly workshops are held.
6	Conservation Commission to have a workshop about deer overpopulation and encourage new hunters.	Dummerston Conservation Commission	High	In planning stages now; remains an action in the Plan update.
7	Town to make available emergency kits for residents with supplies for several days	EMD	High	Not completed and unknown how it would be funded. Not carried forward.

	Action	Responsible Party	Project Priority	Current Status
8	Town and School coordinate on the development and exercising of the School Crisis plan	School officials / Fire Chief / EMD / Town officials	High	This was started, but not completed. The School operates pretty independently from the Town and more coordination is no deemed necessary.
9	Develop and distribute educational material for residents about protecting and enhancing riparian buffers on their property.	Dummerston Conservation Commission	High	This was not done; The Commission now wishes to offer interactive programming for the community.
10	Newsletter article and website information posted about how to clean out your culverts. Road Foreman will inspect problem culverts.	Road Foreman	Medium	This wasn't done and no longer a priority for residents. Road Foreman feels the culverts are being handled appropriately. Road crew handles all culverts that are in the right of way and replaces culverts that need replaced in the right of way.
11	Leonard Road – old boiler tube structure to be up-graded to 12x6x40' box culvert	Road Crew and Contractors	High Medium	Not completed, and now a high priority action.
12	Stickney Brook Road (structure 14) – old boiler tube is coming apart, bent – To be upgraded from 43" diameter to 8' diameter	Road Crew and Contractors	Medium	Completed 2020.
13	17 Waterman Road (structure 1) – culvert to be upgraded to a 6' structure	Road Crew and Contractors	Medium	Completed
14	Park Laughton Road (structure b-11) – old boiler tube to be upgraded to a 6'x20' concrete bridge	Road Crew and Contractors	Medium	Not completed, and still a priority action for this plan update. Goal is 2026.
15	Town to create a section on the website to house emergency related educational materials, including a list of items to have in case of emergency.	EMD and Town Website Administrator	Medium	Not done
16	Article and presentation to share the capabilities of VTAAlert and promote residents signing up.	EMD	Medium	Not done

	Action	Responsible Party	Project Priority	Current Status
17	Update and develop an update schedule (including reach out at TMD) for the towns 'Vulnerable Populations' list	EMD	Medium	Completed; Dummerston Cares now maintains this list
18	Produce and distribute educational material for residents about the proper use of generators and emergency preparedness.	EMD / Fire Chief	Low	Not done and no longer a priority.
19	Develop a tank tie down ordinance requiring tanks in the SFHA to be tied down	Zoning Administrator	Low	Not completed and town feels they could not enforce this and insurance would be a better mechanism to enforce this.
20	Beaver Pond Road – old boiler tube to be upgraded to a 10' wide box culvert	Road Crew and Contractors	Low	Not completed; ongoing action in update
21	Beaver Pond Road (structure 8) – old boiler tube to be upgraded to a 8' wide box culvert	Road Crew and Contractors	Low	Not completed; ongoing action in update
22	Camp Arden Road (structure b-15) – old boiler tube to be upgraded to a 12' wide box culvert	Road Crew and Contractors	Low	Not completed; ongoing action in update
23	Kipling Road (structure b-1) – old 6' boiler tube to be upgraded to a 14' multi-plate arch culvert	Road Crew and Contractors	Low	Not completed; ongoing action in update

Additionally, the Town utilized American Response and Protection Act (ARPA) funds to do several mitigation related projects since the last update:

1	New insulation for the EMD office at the Town Office	Completed 2023
2	Generator at the Center Fire Station	Completed 2023
3	Lighting efficiency upgrades at the West Dummerston Fire Station	Completed 2023
4	Mini-split for the Town office	Completed 2023
5	New bay doors on the West Street Fire Station for energy efficiency upgrade	Completed 2023

3. December 13, 2022 Meeting flyer and agenda

**Dummerston Hazard Mitigation /
Resiliency Plan
Public Meeting Announcement**



Date: Tuesday, December 13

Time: 5:00-7:30 PM

Via Zoom: See Town website or use link
<https://us02web.zoom.us/j/82625027752>

Meeting ID: 826 2502 7752

Phone in: +1 646 558 8656 US

Help update Dummerston's Local Hazard Mitigation Plan!
What actions can the town take now to lower vulnerability to
flooding, fluvial erosion and invasive species?

For more information, contact
Alyssa Sabetto at 802-257-4547 x113



AGENDA FOR TODAY'S MEETING

1. Update of the current Dummerston Local Hazard Mitigation Plan

- Purpose
- Process

2. Hazards

- Brief review of existing Dummerston Local Hazard Mitigation Plan
- Hazards addressed in prior Plan
- Selectboard choices for hazards to address in this update
- Discuss public survey results
- Discuss hazard events that have occurred since the last Plan and particular locations of concern from attendees

3. Mitigation Goals and Actions

- Review Mitigation Goals
- Brief review of the current Mitigation Actions Table that the Town updated
- Create an updated Mitigation Actions Table for the updated Plan
- Identify gaps and capabilities with implementation

4. Other Updates

- Discuss recent mitigation work completed by the town
- Discuss development trends – new developments, upcoming developments
- Overall resiliency concerns or ideas
- Review of other elements and address questions that weren't discussed

5. Next Steps

4. November 16, 2023 Meeting sign-in sheet (part of advertised Selectboard meeting)

Dummerston, VT Local Hazard Mitigation Plan Development Meeting

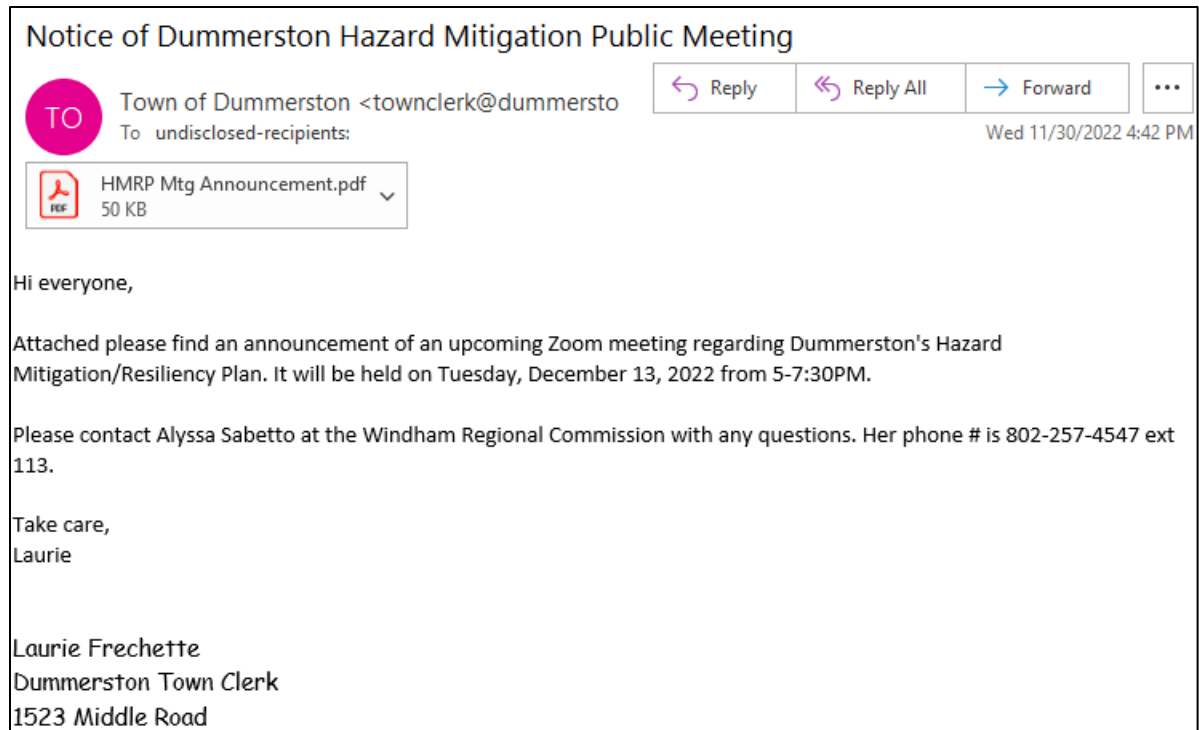
November 16, 2022

Location: Dummerston Community Hall

SIGN IN SHEET

Name and email address	Affiliations – Please list all	Town where you live
Zeke Goodband goodband@dudderston.org	Selectboard	Dummerston
Terry Chapman Chapman@dudderston.org	Selectboard	Dummerston
Maria Glabach Glabach@dudderston.org	Selectboard	Dummerston
Martin Forreth Forreth@sovereign.net	EMD	Dummerston
Lewis White lwhite1991@gmail.com	955. EMD	Dummerston
Leon Chamberlain Leonchamberlain@gmail.com	Rd Foreman	Dummerston
David Baxendale baxendale.davide@yahoo.com	Selectboard	Dummerston

5. Town email sent from the Town Clerk to all Town newsletter recipients



6. Email sent to adjacent towns for comment on the draft plan

7. Email sent to frontline organizations for comment on the draft plan

8. Flyer advertising availability of Draft Hazard Mitigation Plan for public comment

9. Public and Town comments received