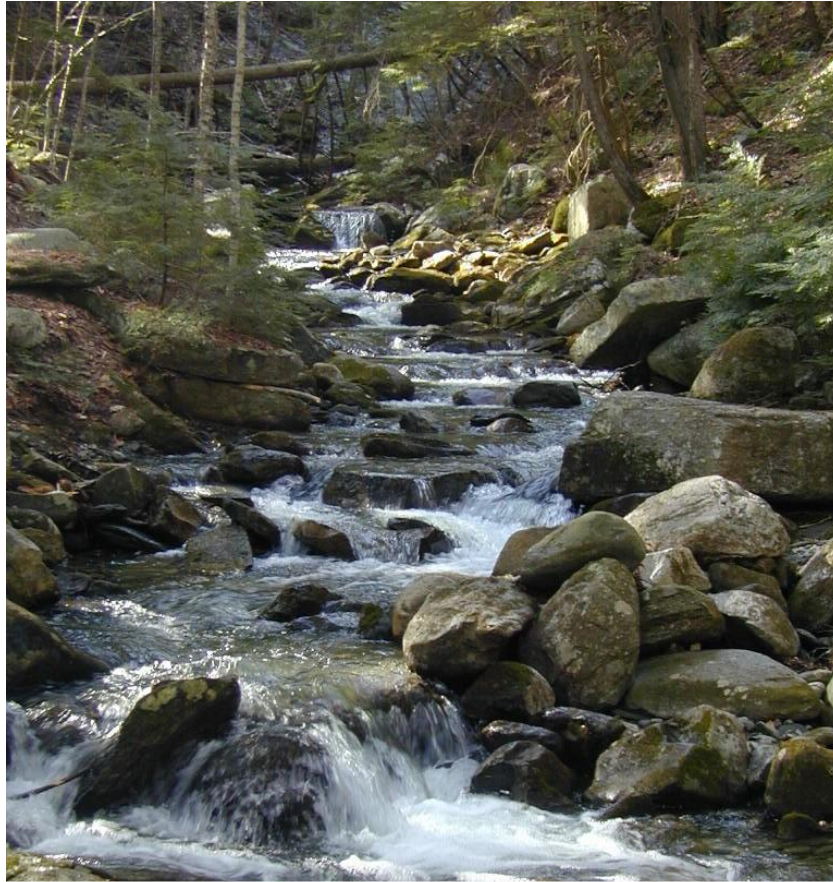


# Townshend Town and Village Local Hazard Mitigation Plan



Townshend Brook



FEMA Approval Pending Adoption Date: 8/22/2025

Town Adoption Date: 8/26/2025

FEMA Final Approval Date: 10/16/2025

**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 Townshend, VT

**A Resolution Adopting the**  
***Town of Townshend Local Hazard Mitigation Plan***

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

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

NOW, THEREFORE BE IT RESOLVED that the Town of Townshend adopts the *Townshend Town and Village Local Hazard Mitigation Plan*. While content related to the Town of Townshend may require revisions to meet the plan approval, changes occurring after adoption will not require the Town of Townshend 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 5 in favor and 0 against, and 0 abstaining, this 26th day of August, 2025.  
month, year

Selectboard

Alvin E. Evans      Rob Wignat  
[Signature]      [Signature]  
[Signature]      [Signature]

ATTEST

Constance Hour

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## 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 Townshend (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:

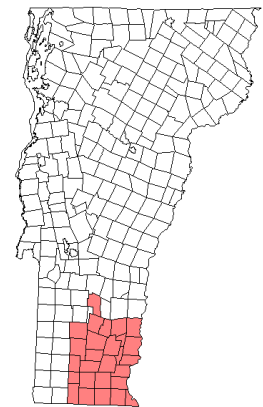
- Identifying actions for risk reduction that are agreed upon by stakeholders and the public.
- Focusing resources on the greatest risks and vulnerabilities.
- Increasing education and awareness of threats and hazards, as well as their risks.
- Reducing the degree of injury and inconvenience to the townspeople 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.

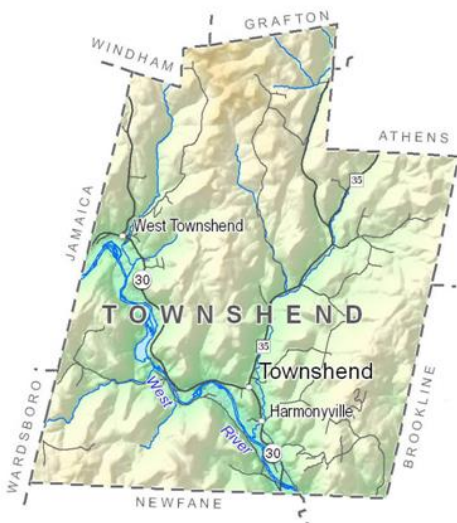


The Region's topography is relatively flat or gently rolling land in the Connecticut River valley in the east, while the western part of the region is characterized by the Green Mountain ridges and peaks with narrow stream valleys. Stratton Mountain is the highest point in the region at 3,936 feet. The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



Townshend is a rural Vermont hill town consisting of 27,334 acres or 42.7 square miles in central Windham County. Townshend is bordered to the north by the towns of Windham, Grafton and Athens; to the West by Jamaica and Wardsboro; to the East by Athens and Brookline; and to the South by Newfane. State Route 30 runs east/west through Townshend and state Highway 35 runs north/south. The topography of Townshend consists of steep hills and narrow valleys. Townshend Town Hall sits at 547 ft. and the highest peak is Acton Hill at 2,017 feet. The dominant water features in Townshend are the West River, which flows west to east along Route 30, and the Townshend Reservoir which is created by the Townshend Dam, a major flood control project operated by the US Army Corps of Engineers. The reservoir lies not far upstream from the villages of Townshend and Harmonyville. There are also numerous brooks and streams and throughout Townshend.

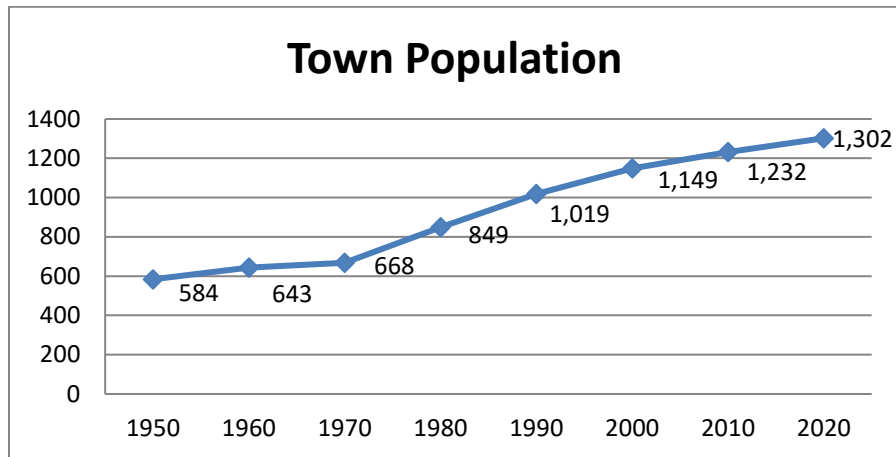
It should be noted that though the Village of Townshend is an incorporated Village, the Village has no official function, no staff, and no real distinction, other than settlement pattern, from the Town of Townshend. To some locals it may be surprising to learn that the Village is incorporated. The Town does not act like the Village is a separate entity. The Town handles all business for the Village. The Village was incorporated in 1916 but in the 1961 Townshend Village voted to merge, but they did so without any formal ratification of the merge by the VT General Assembly<sup>1</sup>. The Village of Townshend is thus still an incorporated (but inactive) Village in Townshend. The Village should be considered to be a part of the “Town” of Townshend in this Plan, unless specifically noted.

### Development and Population Trends

Historic development patterns along waterways have meant that a number of structures are in the floodplain. Development in Townshend is characterized by compact settlements, chiefly in Townshend Village and (the unincorporated) West Townshend Village. Elsewhere homes and commercial establishments are located along rural roadways. At this point in time there are no large scale residential or commercial developments slated for construction. Woodland is the predominant land use in Townshend, covering 86% of the town. Most of this woodland is privately owned, though State Forest covers 1,334 acres. These woodlands provide a scenic backdrop for the villages, as well as providing economic, lifestyle and recreation opportunities associated with wood, maple, hunting and outdoor recreation.

Townshend’s population as of 2020 was 1,302. As the graph on the next page shows, population has been steadily increasing.

<sup>1</sup> Gillies, Paul S. Villages. Shown on VT Secretary of State website < <https://www.sec.state.vt.us/archives-records/state-archives/government-history/continuing-issues/villages-and-cities/history-of-incorporated-villages.aspx> >



Townshend has some seasonal variation of population with second homeowners and visitors. The summer and winter population level is about 20% higher than in the shoulder seasons. Stratton Mountain Resort is located not far from Townshend in the adjacent town of Jamaica and is the primary reason for the seasonal population shift.

Overall, while there have not been appreciable changes in Townshend 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

Townshend is served by the Townshend Volunteer Fire Department (TVFD), a private, non-profit organization that operates through town contributions and fund-drive and private contributions. The Department serves the entire town and has mutual aid agreements with surrounding towns. They operate out of the fire station on Grafton Road in Townshend Village. There are currently 15 active member volunteers that run the TVFD. 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. TVFD aims to be the first to arrive on the scene in emergencies: medical calls and motor vehicle accidents comprise the vast majority of responses. TVFD does not provide EMS services. First response for medical calls in Townshend are provided by New Brook, Jamaica and Grafton Rescue. Rescue Inc. contracts EMS and transport services for Townshend. TVFD is a member of Windham County Firefighters, and is dispatched by Southwestern New Hampshire Mutual Aid. TVFD is operated by an Executive Board comprised of the Fire Chief, Assistant Fire Chief, Secretary and Treasurer. TVFD makes all efforts to recruit volunteer fire-fighting personnel to protect the town. Members attend training courses sponsored by Vermont Fire Academy and the various mutual aid associations.

Police protection is provided by the Vermont State Police and the police departments of surrounding towns. The Town does also have a Constable.

An Emergency Management Director (EMD) appointed by the Selectboard coordinates emergency preparedness and response for the Town. The EMD coordinates a volunteer team during events as needed. The primary method of emergency notification is two-way radios and Vermont Alert. An Emergency Operations Center (EOC), located in the Town Hall is the command center for town officials and emergency operations staff. There is no backup generator at the Town Hall. The backup EOC would be operated virtually. To mitigate the impacts of power outages, the following public buildings/critical facilities have been equipped with back-up power or generator hook-up: Grace Cottage Health Center, Valley Cares and the Townshend Fire Department.

The Dutton gym at the Leland and Gray High School is the designated emergency shelter in Townshend. The nearest hospital is Grace Cottage Family Health and Hospital in Townshend, followed by Brattleboro Hospital 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 Townshend, but there are two privately owned large capacity waste disposal systems in Townshend Village. Their leach systems are on town-owned property.

## **Transportation Infrastructure and Act 64**

State Route 30 runs east/west through Townshend and state Highway 35 runs north/south. They are the main roadways.

There are 720 town owned culverts in Townshend, of which 64 are in poor condition, 1 is in critical condition, 3 are in closed condition, and 1 is in unknown condition. There are 18 town owned bridges, 9 short and 9 long.

There are approximately 7 miles of state highway, 11 miles of Class 2 town roads, 45 miles of Class 3 town roads, and 6 miles of Class 4 roads in Townshend. Approximately 36.4 miles or 65.6% 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 Townshend 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. Townshend will also be required to develop Road Stormwater Management Plans for all hydrologically connected road segments not meeting MRGP standards. Townshend 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 Townshend, 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 Townshend that do not have access to high-speed internet service. The town library and the town office offer wireless internet hotspot at the community center. Cell phone coverage fluctuates throughout the town, 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:

- Allie Evans, Selectboard Chair
- Nick Suarez, Selectboard, local lead on plan development
- Connie Holt, Selectboard Assistant
- Alex Cote, USACE Townshend Dam
- Bob DeSiervo, Townshend Planning Commission
- Brian Schmidt, Townshend Volunteer Fire Department, Asst. Chief
- Crystal Derocher, Grace Cottage Family Health and Hospital
- Eric Wilson, Rescue Inc., Asst. Chief
- Jeremy Zumbruski, Townshend Highway
- Jorda Daigneault, Leland and Gray School
- Karen LaRue, Townshend Library
- Kate Jansak, Selectboard
- Marilee Attley, Townshend Library
- Pamela Corbett, VT Dept. of Health and Townshend resident
- Randy Lichtenvalner, Townshend Elementary
- Rick Maischke, Townshend Planning Commission

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 Multi-Jurisdictional Plan approved for the Town and Village of Townshend by the Federal Emergency Management Agency (FEMA) effective 2/26/2016 and expired on 2/25/2021. 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	The above listed Planning Team represents a wide range of stakeholders in the community.
General public involvement	An online survey was conducted for several weeks in April and May 2024 to gather input on lived experience of natural hazards in Townshend 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 on a frontpage article in the town newsletter which has a wide audience. Two public meetings were held, and the draft was discussed at a Selectboard meeting.
Businesses, academia, and other private and non-profit interests	The following entities were personally invited to the public meetings and the draft plan was provided to them for review and comment via email (see appendix): <ul style="list-style-type: none"> <li>• Green Mountain Power – Electric Utility. Consulted via email on loss of power statistics and other resiliency projects planned for Dummerston.</li> <li>• Grace Cottage Family Health and Hospital – medical provider in Townshend.</li> <li>• Valley Cares – senior housing facility in Townshend.</li> </ul>

	<ul style="list-style-type: none"> <li>• Rescue Inc. – EMS provider in Townshend.</li> <li>• Vermont EMS Academy – located in Newfane</li> <li>• US Army Corps of Engineers – owner/manager of the Townshend Dam</li> <li>• Townshend Elementary School</li> <li>• Leland and Gray Union Middle and High School – they are also a local emergency shelter</li> <li>• Townshend Library</li> <li>• River Bend Farm Market – local supplier of staple goods</li> <li>• Kindle Farm School – local private school</li> </ul>
<p>Neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development</p>	<p>The draft plan was provided via email for review and comment to:</p> <ul style="list-style-type: none"> <li>• The Planning Commissions and Emergency Management Directors of the adjacent towns of: Windham, Grafton, Athens, Jamaica, Wardsboro, Brookline and Newfane.</li> <li>• Basin Planner for the Agency of Natural Resources Department of Environmental Conservation.</li> <li>• 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.</li> </ul>
<p>Representatives of nonprofit organizations, including community-based organizations that work directly with or provide support to vulnerable populations or frontline communities</p>	<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"> <li>• <a href="#">West River Community Project</a> - nonprofit community center dedicated to promoting local agricultural, economic, and social activities, and operating out of the West Townshend Country Store.</li> <li>• <a href="#">Senior Solutions</a> – resource for aging Vermonters</li> <li>• <a href="#">MOOver</a> – Provides regional bus and shared ride transport service.</li> <li>• <a href="#">The Gathering Place</a> – Safe space for people with physical or cognitive impairments.</li> <li>• <a href="#">Groundworks Collaborative</a> – Based in Brattleboro. Serves people who are facing housing and food insecurity.</li> <li>• <a href="#">Brattleboro Area Hospice</a> – Provides programs to dying and grieving community members.</li> <li>• <a href="#">Health Care &amp; Rehabilitation Services (HCRS)</a> – A comprehensive community mental health provider.</li> <li>• <a href="#">Southeastern Vermont Community Action (SEVCA)</a> – Anti-poverty, community-based non-profit.</li> <li>• <a href="#">Visiting Nurse and Hospice for VT &amp; NH</a> – Home, health, hospice and pediatric services.</li> <li>• <a href="#">Women's Freedom Center</a> – Based in Brattleboro and working to end physical, sexual and emotional violence against women.</li> <li>• <a href="#">VT211</a> – non-emergency information resource for those facing crisis or are in need of guidance on available resources.</li> </ul>

The planning process overview is bulleted here and items relating to that process are in the appendix:

- April 2024 – Kick-off call to set up the public meetings and develop the Planning Team. Nick Suarez, a Selectboard member, was the local lead and invited team members.
- May 8, 2024 - The Planning Team reviewed the prior plan, completed the hazard assessment and reviewed hazard mapping at a public meeting.

- May-August 2024 – A public survey was posted on Front Porch Forum, discussed at the public meetings for the LHMP, discussed at the May 8<sup>th</sup> Selectboard meeting, and noted in a frontpage Townshend News article.
- July 10, 2024 – A second in-person public meeting of the Planning Team that focused on development of mitigation actions.
- The draft was presented for internal town review by the Committee and other town personnel and appointees on June 25, 2025. This internal town review period was from June 25-July 2. One comment was received.
- Alyssa then finalized the draft for public comment.
- A draft of the Plan was posted from July 7-21 on the town website for public comment.
- Physical copies of the draft Plan were available at the Town Office.
- Flyers were put up around town for public comment on the draft.
- The draft plan was distributed to all adjacent towns for comment during a two-week period.
- The draft plan was sent to identified entities serving vulnerable residents or providing community lifeline connections.
- Several minor public comments were received and are were incorporated into the draft.



Advertisements for all public meetings were sent to local stakeholders directly via email from Nick Suarez, and were publicly shown on the town unofficial website, the Townshend News, 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 2016 Townshend 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

## 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:

- Surveys and warned, public meetings collecting public comment (issues raised were addressed in plan and the public meeting)
- 2024 Local Emergency Management Plan – local emergency resources
- Local knowledge of Planning Team members and other stakeholders – community impacts, priorities, trends, and overall plan guidance
- 2016 Townshend 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
- 2017 Townshend Town Plan – community profile, mitigation related actions and goals
- US Drought Monitor to quantify historic periods of drought in Windham County
- Townshend Flood Hazard Regulations – the town does not have other zoning
- 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 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, draft maps were also available for ongoing update
- 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 forest pest data
- Vermont Department of Health – Heat data
- [2025 Upper West River Corridor Plan](#)
- Wildfire data provided by Townshend Fire Chief

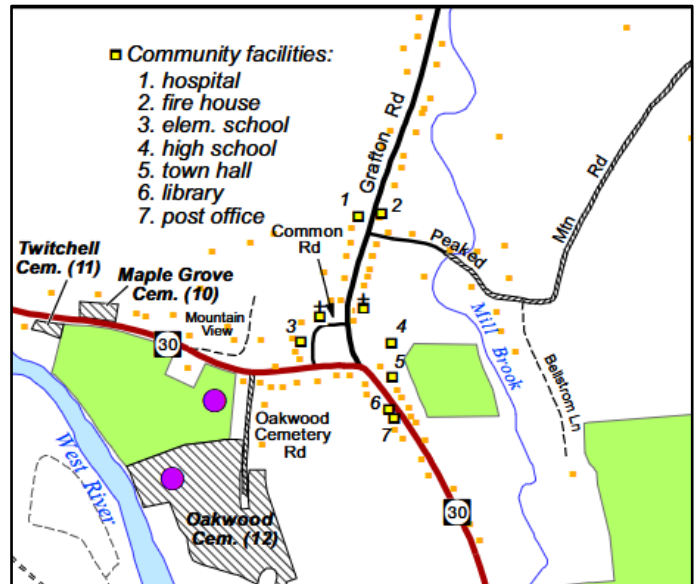
## HAZARD IDENTIFICATION AND RISK ASSESSMENT

### 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. The primary assets are:

#### Townshend Village:

- Grace Cottage Family Health and Hospital
- Townshend Volunteer Fire Department
- Townshend Elementary School
- Leland and Gray Union Middle and High School
- Town Hall
- Townshend Library
- Post Office



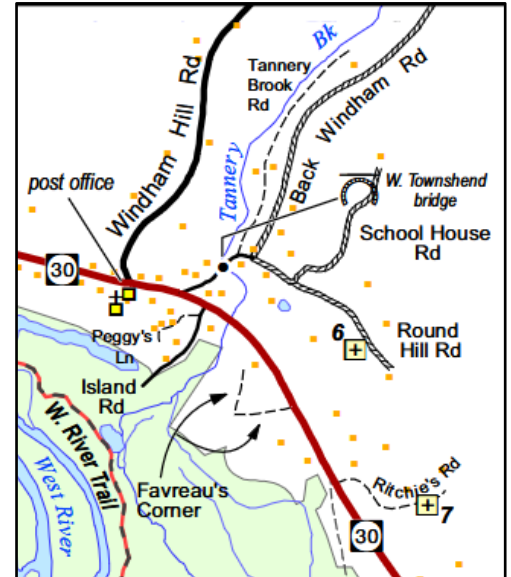
West Townshend:

- West Townshend County Store, which also houses a Post Office

## VTrans Transportation Infrastructure Vulnerability Mapping

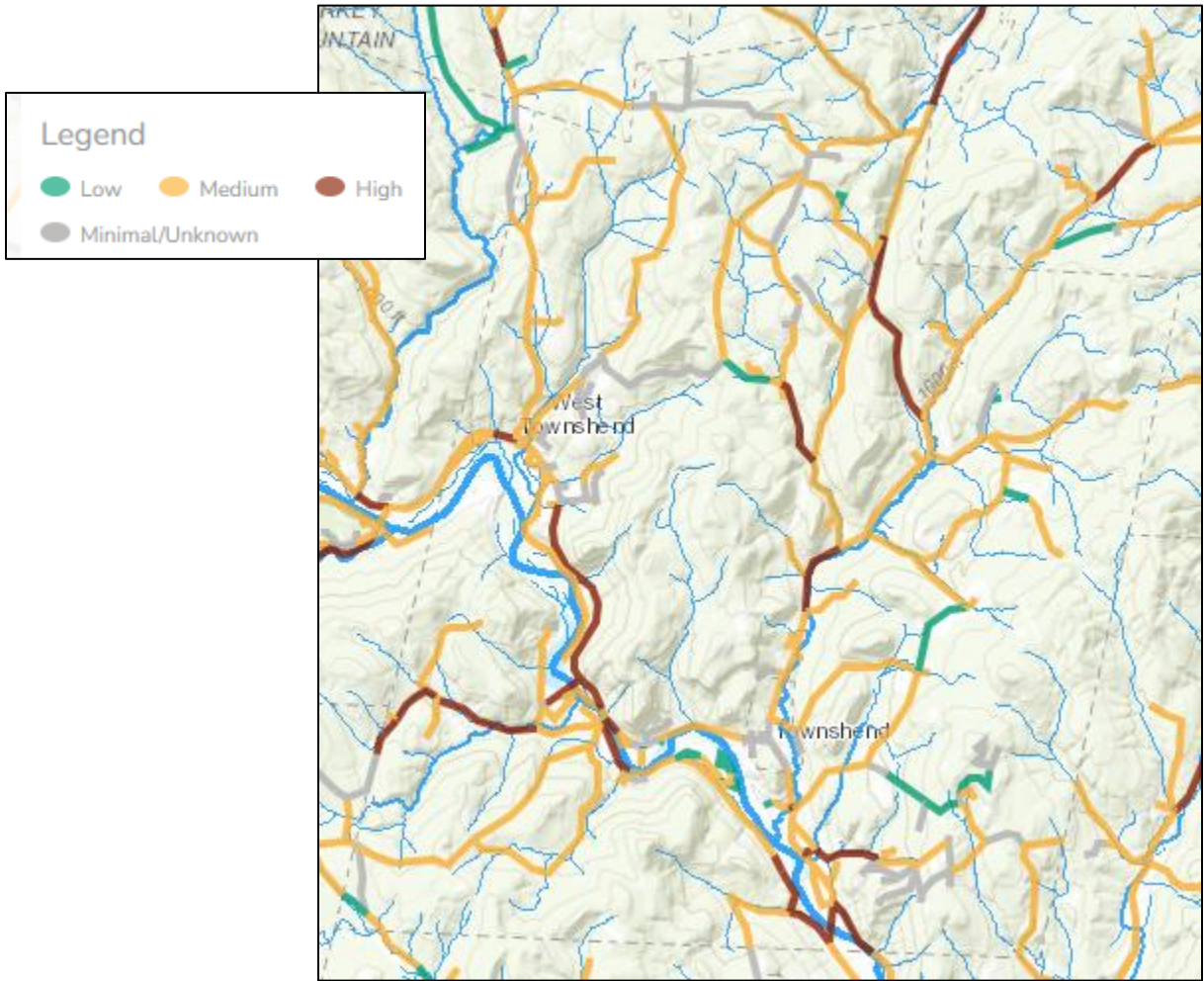
The Vermont Department of Transportation has developed a 'Transportation Resilience Planning Tool' to quantify the flood vulnerability and risk of bridges, culverts, and road embankments throughout the state.<sup>2</sup> Vulnerability assessments were completed for the following infrastructure:

- 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



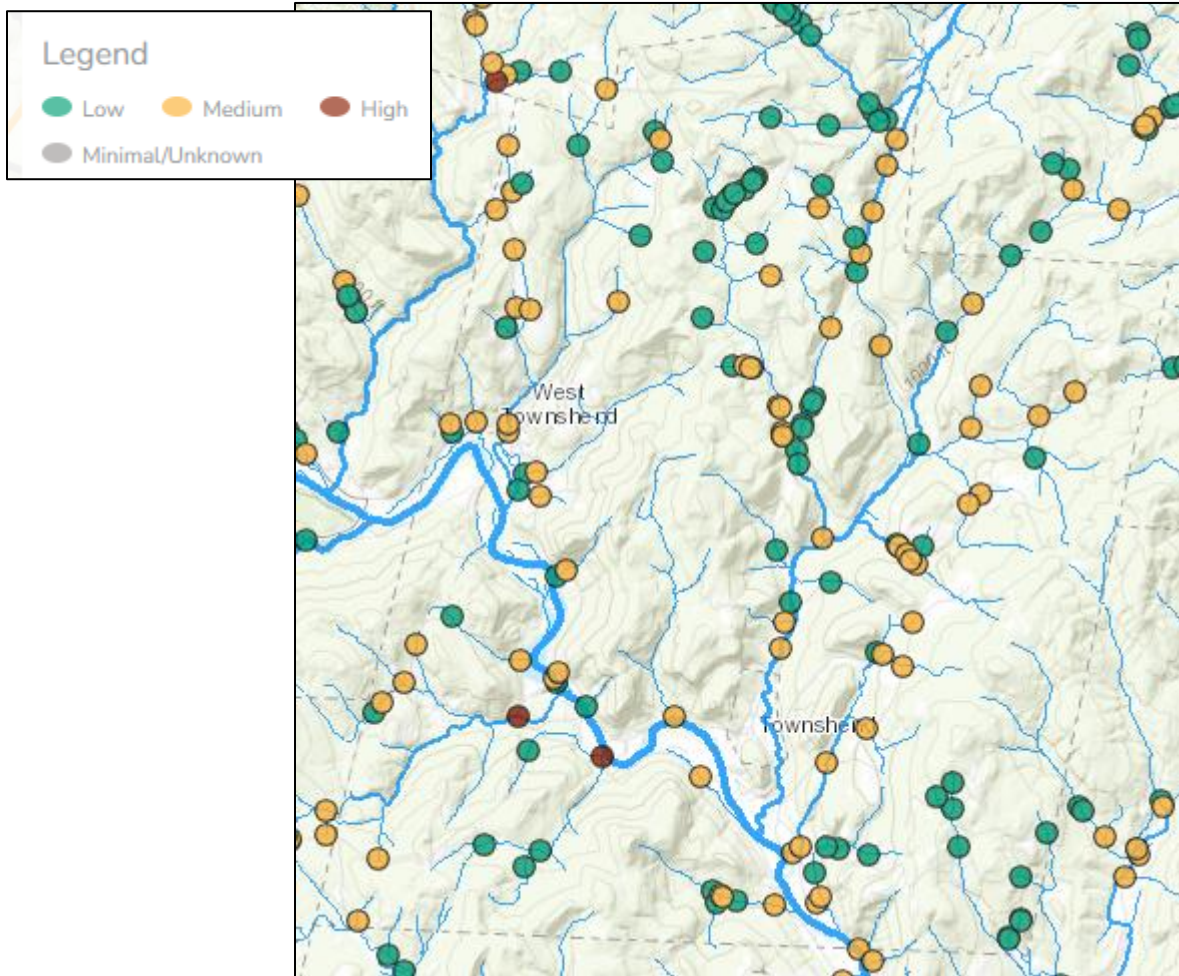
The map shown here provides a vulnerability analysis of roads and bridges that are at risk of inundation, erosion, or deposition related to a 100-year flood event. The Tool combines river science, hydraulics and transportation planning methods and is applied at a watershed scale. This data can be used 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.

<sup>2</sup> VTrans Statewide Highway Flood Vulnerability and Risk Website: <https://vtrans.vermont.gov/planning/transportation-resilience/statewide>



The map above identifies sections of State Forest Road, West Hill Road, Ellen Ware Road, Plumb Road, Dam Road, Route 30, and Route 35/Grafton Road as being highly vulnerable road segments, particularly due to erosion. The bridge over Mill Brook is the only bridge that is ranked as highly vulnerable.

The below map is the same data, but showing culverts. There are only two highly vulnerable culverts, one on Dam Road and one on State Forest Road.



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

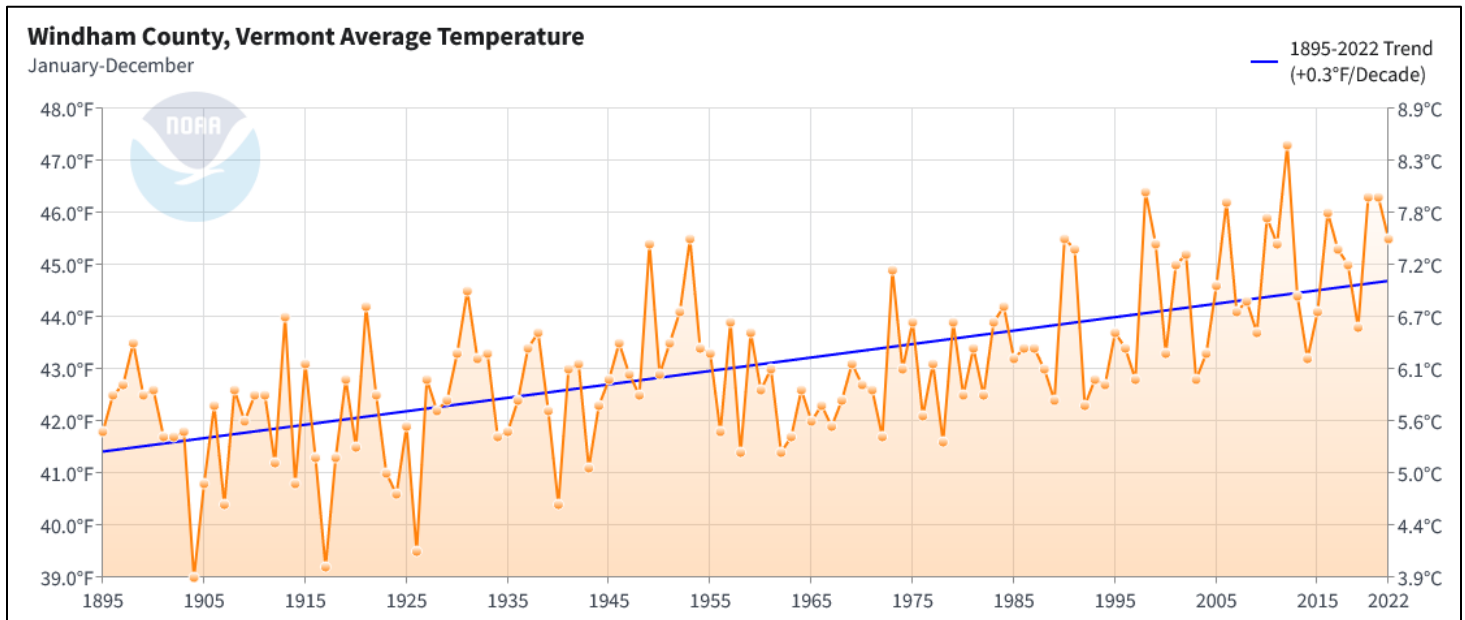
There have been 24 Presidential Disaster Declarations in Windham County since 1953: 8 Floods, 8 Severe Storms, 3 Hurricanes, 2 Biological Incidents (both Covid-19 related), 1 Snowstorm, 1 Tropical Storm and 1 Severe Ice Storm.<sup>3</sup> July, August and September are the months that historically have 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
4762	12/18/23	12/19/23	3/2/24	Severe Storm	SEVERE STORM AND FLOODING	
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

<sup>3</sup> 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 12/12/2024

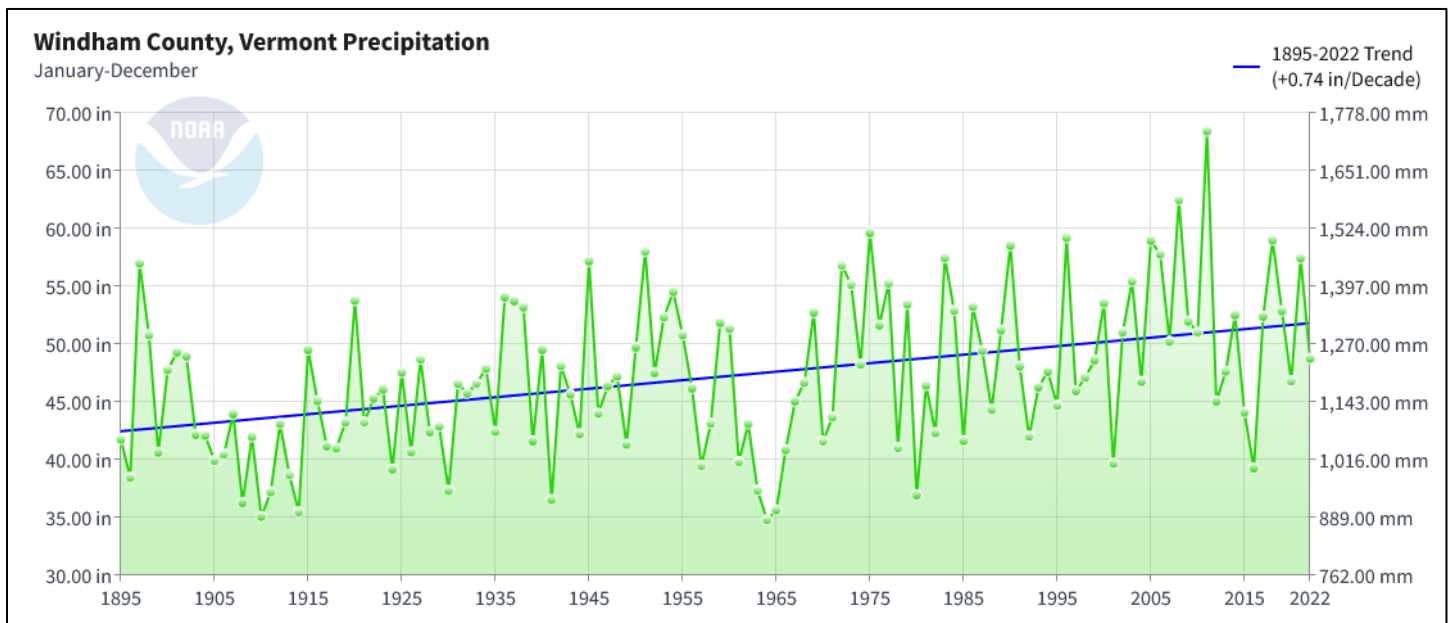
## Climate Trends

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).



Data source: NOAA Climate at a Glance

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.



Data source: NOAA Climate at a Glance

## Power Outage Statistics<sup>4</sup>

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’.

	<b>Avg Length of Outages in Hours Per Year</b>	<b>Avg # of Times a Customer was Without Power Per Year</b>	<b># of Hours the Typical Customer was Without Power Per Year</b>
<b>2023</b>	6.52	11.55	75.31
<b>2022</b>	5.99	6.84	40.93
<b>2021</b>	2.86	10.52	30.13
<b>2020</b>	2.45	5.76	14.12
<b>2019</b>	3.28	7.42	24.32
<b>Annual Average 2019-2023</b>	4.39	8.42	36.96

Townshend power structure serving the 881 meters in the town: A vast majority of the customers in Townshend are fed off of GMP’s sub-transmission line #33. The sub-transmission line spans from Newfane to Rawsonville and it’s approximately 20 miles in length and the tap to the East Jamacia sub (and the East Jamacia “G7” circuit) is in the middle of the sub transmission line. The Londonderry (LO-G26) sub and circuit are also sourced from this same sub. The East Jamacia G7 circuit feeds all of the town with the exception of the most northern part where the Londonderry G26 (LO-G26) circuit serves the Northwest corner and the Chester (CH-G11) circuit serves the northeast corner (see screenshot).

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 Townshend 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: Grace Cottage Health Center and the Townshend Fire Department. The Town Hall (local emergency operations center), the Town Garage, and Townshend Elementary (gymnasium is emergency shelter) all lack generators.

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

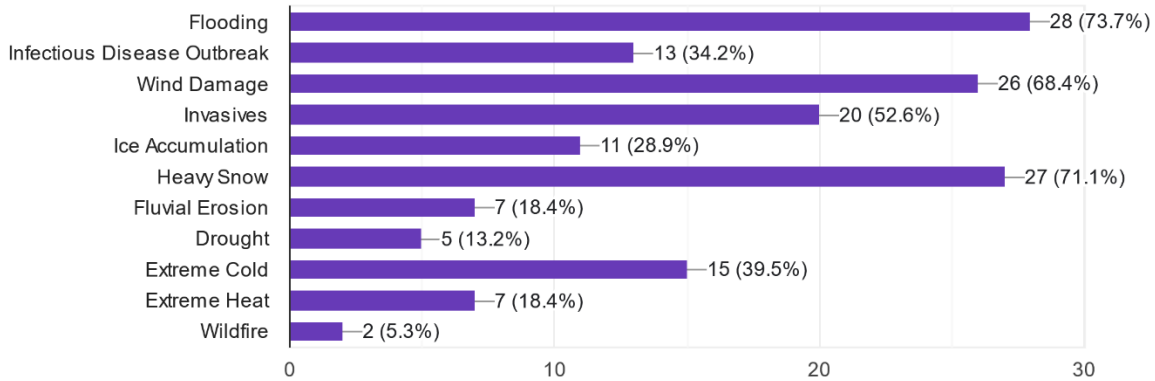
A public survey was conducted to understand what natural hazards are of concern to people in Townshend. The survey was on the Town website for a few months and was posted on Front Porch Forum, advertised in the Town newsletter and mentioned during at least two public meetings. There were 43 responses to the survey, which is a great response rate for this type of survey. The hazards of highest concern are flooding, heavy snow and high winds.



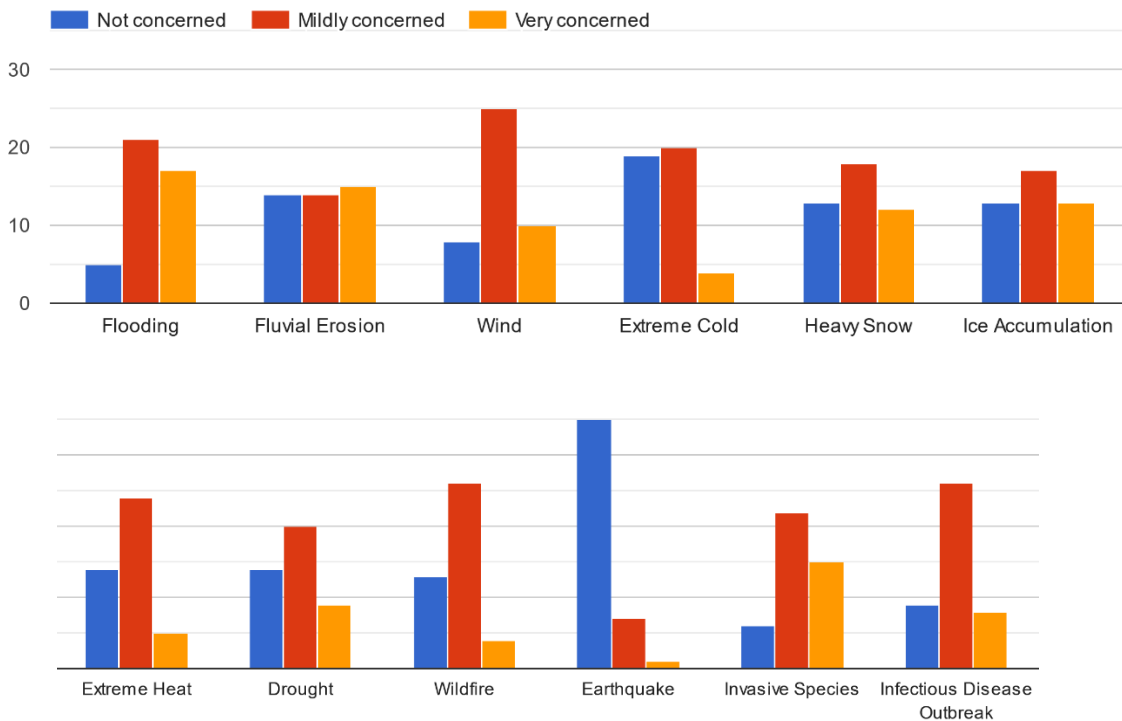
<sup>4</sup> Data provided by Ken Couture of Green Mountain Power via email 12/19/24.

## What Hazards Have You Experienced in Townshend?

38 responses



## How concerned are you about the following hazards in Townshend?



The hazard ranking process has been revised since the 2016 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 10 or higher considered medium or high and are profiled in this Plan. For Townshend, this includes: Wind (including tropical storms), Ice, Snow and Cold (combined), Fluvial Erosion and Inundation Flooding (combined, and including ice jams), Drought, Invasive Species, Wildfire and Heat.** These hazards are inclusive of the hazards of concern to respondents of the public survey, shown above, of which the most “very concerned” responses were for

flooding and fluvial erosion hazards. The hazards most commonly experienced in Townshend, according to survey respondents, are flooding, high winds and heavy snow.

Possible Hazard	Previous Occurrences	Probability of Future Occurrences	Linked to climate change (add 1 point)	Vulnerable Assets	Vulnerable Residents	Score:
Wind	4	4	1	4	4	17
Ice	3	4	1	4	4	16
Snow	3	4	1	4	4	16
Cold	3	4	1	4	4	16
Fluvial Erosion	4	4	1	4	2	15
Drought	3	3	1	4	4	15
Invasive Species	2	4	1	4	2	13
Wildfire	1	3	1	4	2	11
Inundation Flooding	3	4	1	1	1	10
Heat	2	3	1	0	4	10
Hail	3	3		1	1	8
Infectious Disease Outbreak	1	2	1	0	4	8
Earthquake	0	1		0	4	5
Landslides	1	2		0	1	4

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 10 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.



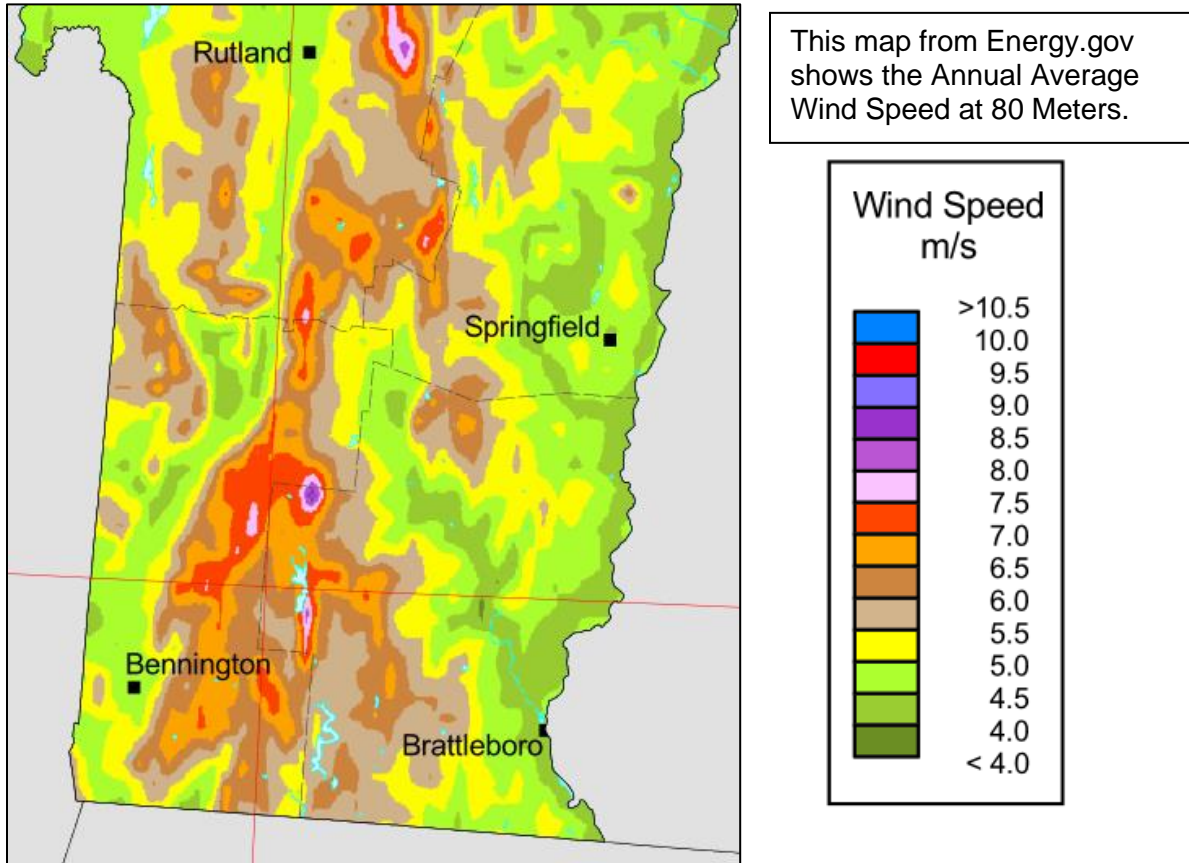
## Highest Risk Hazard Profiles

### 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. Additional development at high elevation would increase risk associated with high winds. Aging population can be more vulnerable to the secondary hazards associated with high winds, such as power outage, as they are often more reliant on a reliable electric power source for their health and safety.

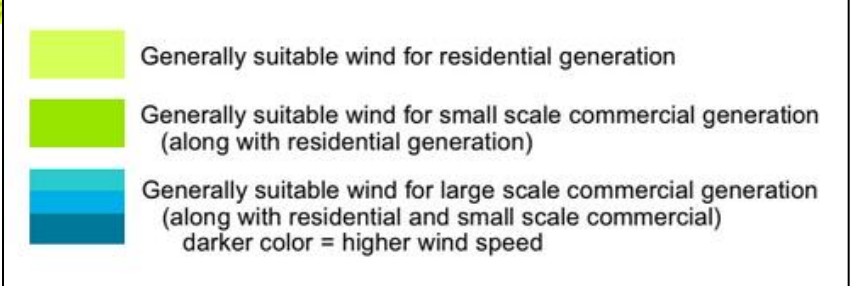
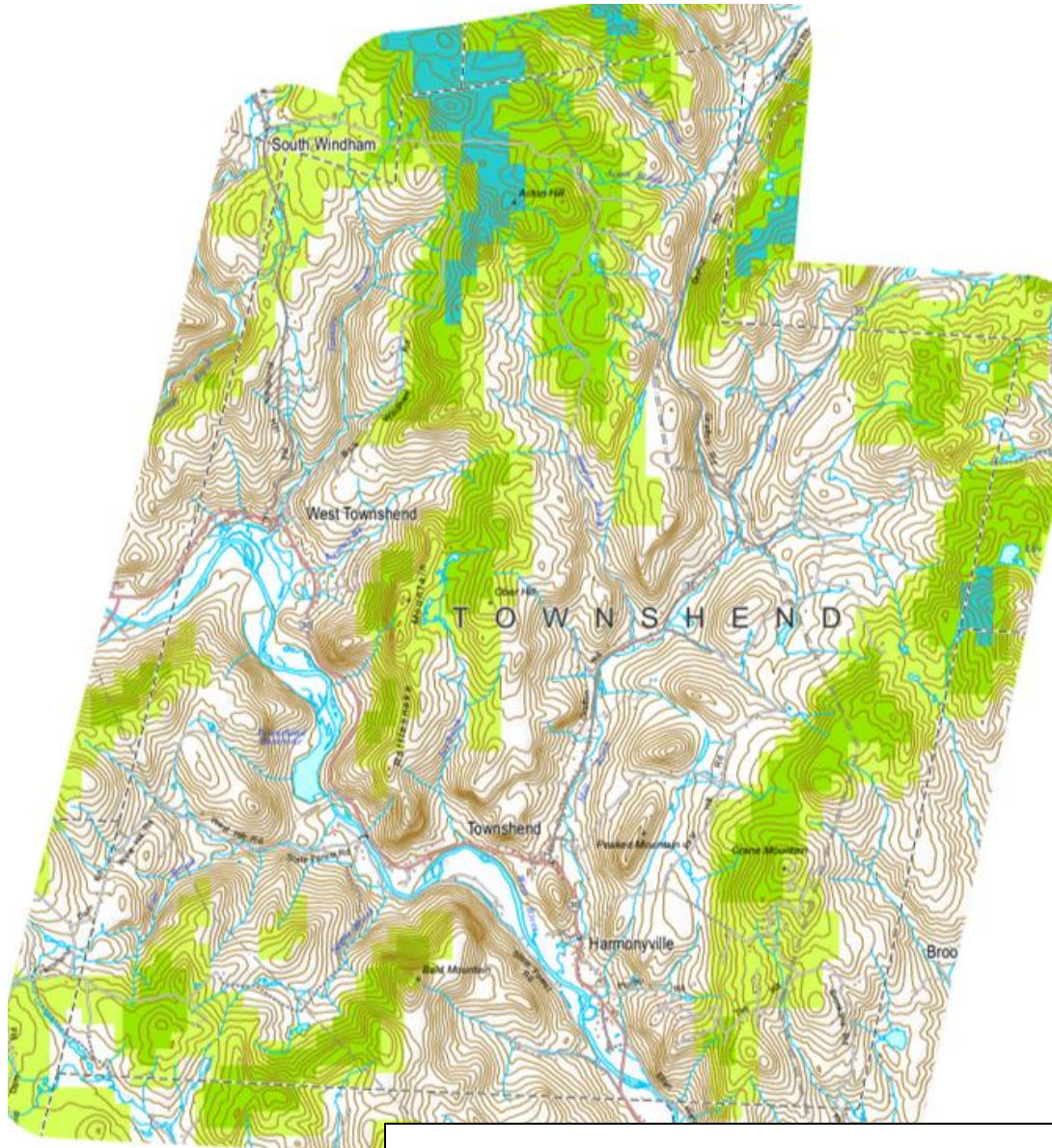
There are many trees in close proximity to roads, buildings and power lines. GMP trims trees near their lines only. There are areas where power lines go through the forest, so tree trimming is not as practical. Consolidated Communications does no tree maintenance. Town road crews generally do tree and 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 speed<sup>5</sup>. The higher elevations in town, areas such as Acton Hill, Rattlesnake Mountain and Crane Mountain having the highest wind speeds. Any future development in the high wind areas (green and blue areas below) should consider mitigation of high winds.

<sup>5</sup> 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 assigned<sup>6</sup>. 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

<sup>6</sup> 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.	Windham Road, Deer Valley Road and East Hill Road are in areas of higher average winds; trees get knocked down in large storms; Overall trees lost, roads blocked, power outages, structural damage to houses	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.

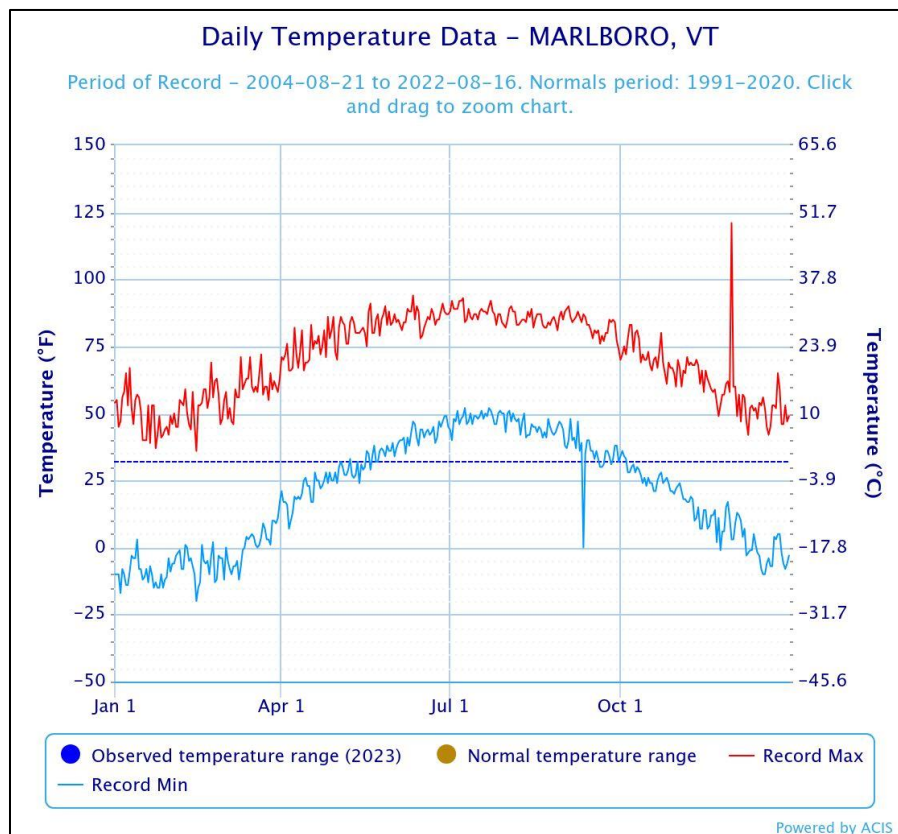
Severe winter weather affects the entire planning area, though higher elevations generally experience more extremes. An ice storm crossed the region in December of 2008 causing widespread downed trees and power outages in the region. The total cost of damages across the region triggered a Presidential 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. Unless fitted with an automatic generator, 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. Snow loads are particularly hazardous for flat roof homes such as manufactured homes. 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. An aging population may be more vulnerable to ice, snow and cold due to power outage concerns. The housing stock in Townshend is older and therefore less energy efficient and more vulnerable to cold intrusion, and this disproportionately affects low-income households. Without new housing planned in Townshend to any large degree, there is a need for making the existing housing stock more energy efficient.

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  $-15^{\circ}$  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	Older residents; Road accidents, power outages, damage to property, docks, shorelines	Worst ice storm in recent history was in December 2008 (DR1816); Snow and sleet amounts of 1-3 inches fell, along with ice accretion of ½ - ¾ of an inch	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

## 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 [wilmingtonvtfloodingrelief.com](http://wilmingtonvtfloodingrelief.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 Townshend<sup>7</sup>:

<sup>7</sup> OpenFEMA Dataset: Public Assistance Grant Project Summaries

DR #	Date of Declaration	Event Type	Awarded Amount
4621	9/29/2021	Flood	\$256,168
4022	9/1/2011	Hurricane (TS Irene)	\$965,700
1816	1/14/2009	Severe Ice Storm	\$29,748
1698	5/4/2007	Severe Storm	\$128,503
3167	4/10/2001	Snowstorm	\$5,357
1336	7/27/2000	Severe Storm	\$243,789

## Local Flooding Concerns and Experience

Most of flooding concern in Townshend is due to fluvial erosion rather than inundation, primarily because of the hilly/mountainous topography. Special Flood Hazard Area (SFHA) is limited to the mainstem of the West River, and partway up Mill Brook.

Drainage ditches and culverts are the biggest concern for local flash flooding events. Flash floods typically occur in high elevation drainage areas as a result of thunderstorm activity. Infrastructure and structures along higher elevation streams and drainage areas are most susceptible to damage from flash flooding. Vulnerable areas are Simpson Brook and its adjacent Simpson Brook Road. There is flood risk along most of the Brook, with trees falling into the Brook, increases the risk of jams and there are two undersized bridges on the southern end of the road which are at risk of jams. Additionally, West Hill Road off of State Forest Road and Fair Brook near West Hill Road are both known for flooding. These are mountain streams and flash floods impact them particularly because of the elevation of their watershed. There are a number of other mountain streams in Townshend, including Mill Brook, which crosses under Route 30 in Harmonyville and frequently floods. There are also flooding issues along Grafton Road/Route 35 south of the intersection of Deer Valley Road going into Townshend.

During the July 2023 flooding there were a number of households near the Townshend Dam and along the West River that did evacuate. West Hill Road near Dam Road intersection flooded. Ellen Ware Road across from River Bend Market was flooded. Townshend State Park dealt with damages and the campgrounds were evacuated. USACE did call local EMDs and advise of evacuation recommendation of vulnerable residences and riverside locations.

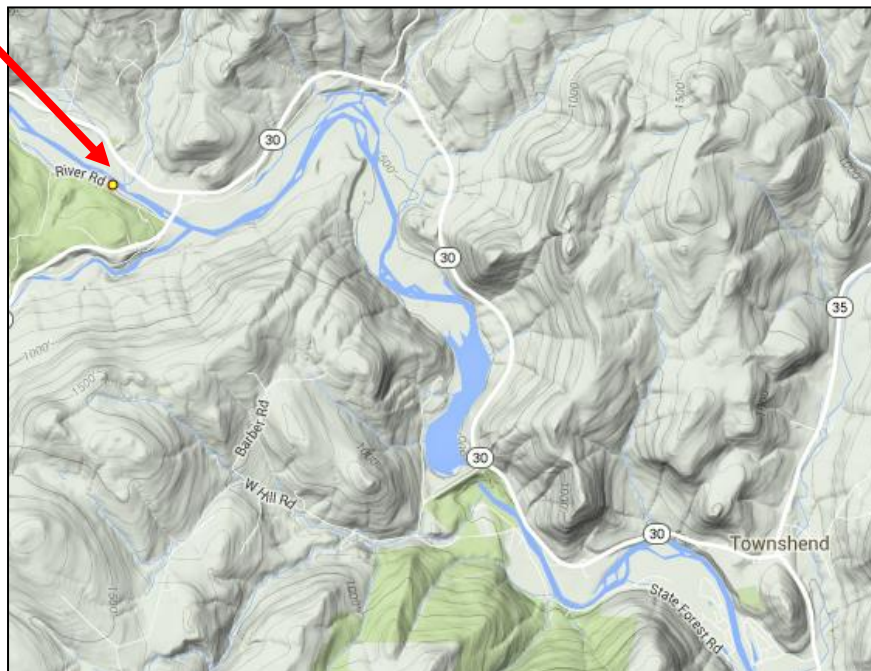
Route 30 and Route 35 are primary routes for the entire region. On Route 30 south of the River Bend Market is a low-lying area, just outside the Special Flood Hazard Area, that frequently floods. This section of Route 30 gets inundation flooding on the road, making it impossible to cross and cutting off a main road. The southern portion of Townshend, around Harmonyville, is more susceptible to flooding due to the flat river valley. Townshend Village and West Townshend are relatively protected from flooding.

Fluvial erosion is an issue in many of the same places that flooding is an issue—Simpson Brook; Mill Brook upstream by Barber Road; and Roaring Brook on Plum Road. The Town also notes that State Forest Road experiences fluvial erosion along it, including at Bald Mountain Campground. The primary cause of the fluvial erosion in Townshend is road cuts into stream valleys, which tend to incise—taking the road and the trees with them. The roads were put in these valleys, along the streams, because it was easier to locate roads there historically, but those choices lead to erosion concerns with today's larger events.



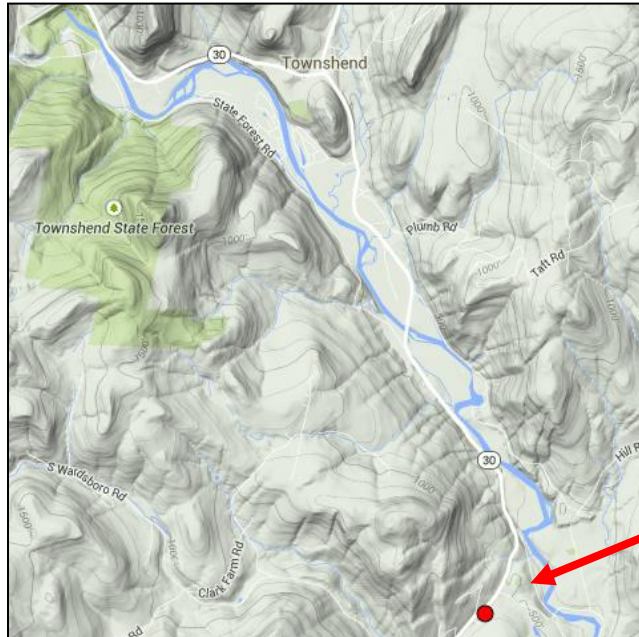
Fluvial erosion in Townshend after TS Irene in 2011

Ice jam flooding is fairly common in the early springtime, around March timeframe. 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. Townshend doesn't have mapped ice jams in its borders, but there are two jams in close proximity upriver and downriver on the West River.<sup>8</sup> These are shown below.



The mapped ice jam shown above has one known occurrence. It is located where River Road bounds the West River in East Jamaica. This jam could influence western Townshend because it is upstream.

<sup>8</sup> CRREL Ice jam database/map <<https://icejam.sec.usace.army.mil>>

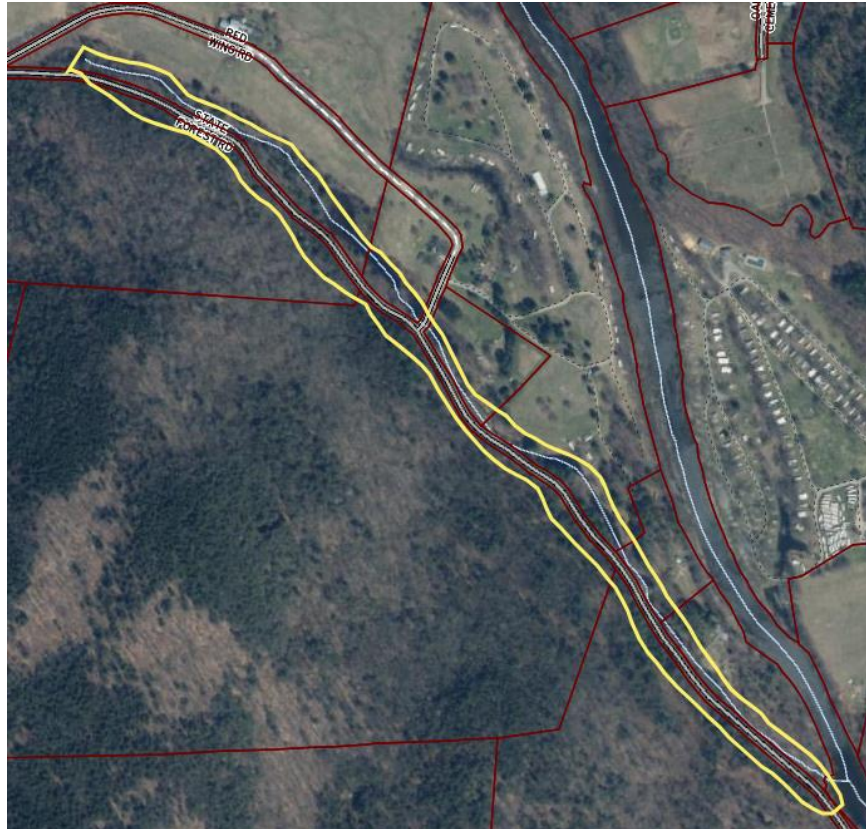


The ice jam shown above has eleven known occurrences. It is located along Route 30 in Newfane, just south of Harmonyville in Townshend. The probability of ice jam flooding is likely due to climate change increasing freeze/thaw cycles. Asset impacts are likely to increase due to the effects of climate change.

Events of the largest magnitude at the nearest recording station:

<b>Highest Precipitation By Day: Marlboro, VT</b>	
<b>Date</b>	<b>Amount (inches)</b>
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 5/12/2025	

There are a couple of areas in Townshend where fluvial erosion is evident. Most issues are areas of gradual erosion where rivers and roads are close together. The first area is along State Forest Road where a West River tributary runs along the road (see the circled area). This area of concern is approximately 20.4 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 Mill Brook on the bank opposite the tennis courts in Townshend Village. The area of concern is approximately .6 acres and is on private land.



## Dam Failure

The Townshend Dam, which is owned and maintained by the US Army Corps of Engineers (USACE), is located in Townshend. It is a flood control dam and it creates the Townshend reservoir, which is 4-5 miles long and is a recreation area and a wildlife preserve. Dam inspections and constant monitoring are part of the role of USACE and the two full time staff at the Dam, but inspection reports are not automatically provided to the Town. Concern about dam failure of Townshend Dam was not raised during the public process for the Plan update.



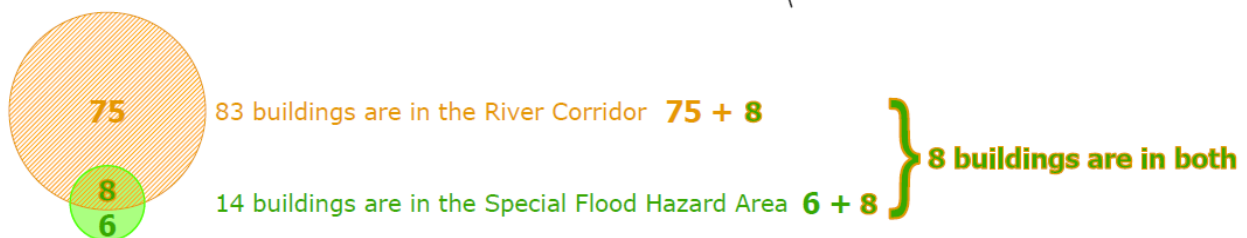
There is more concern about Ball Mountain Dam, which is upstream USACE dam in Jamaica. If Ball Mountain dam failed, it would take out the Townshend Dam, causing a cascading major flood event. Silt buildup in the Townshend reservoir is a concern of the Town.

During the July 9-10, 2023 rain event, water levels behind the dam did increase to 85% of capacity and some emergency notification protocols were initiated. The USACE is currently updating the Townshend Dam Master Plan which has not been updated since the 1960s. The Town has been working with USACE to keep momentum around the importance of open dialogue with the town and ensuring that the town's concerns are considered during the Dam Master Plan update.

## Structures in Mapped Flood Hazard Areas

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.

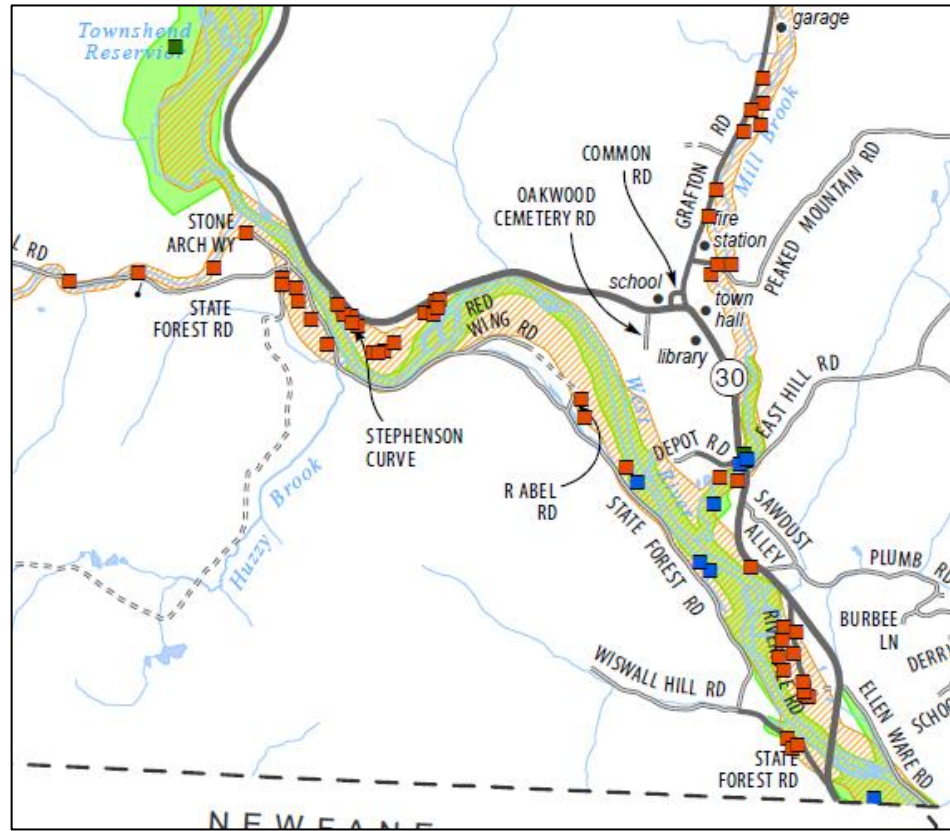
Property owners with a federally backed mortgage on a building in the SFHA are required to purchase flood insurance. A town being a member of the National Flood Insurance Program (NFIP) provides residents with access to flood insurance through the NFIP. If a town is not a member of the NFIP, residents 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.



$$\begin{array}{r}
 75 \\
 8 \\
 + 6 \\
 \hline
 89
 \end{array}$$

89 buildings are mapped as being susceptible to flooding hazards

Inset views show areas of Townshend with the highest concentration of flood vulnerable structures. Note that two of these areas are also discussed in relation to fluvial erosion risk.



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

Eighty-nine 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.

In total, these 4 policies cover \$1,400,000 in value.

*There are 0 repetitive loss properties.*

Only 4% of flood vulnerable structures in Townshend have flood insurance. This is an economic vulnerability for many residents in the event of a large flood event.



## 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 State Forest Road (20.4 acres)	Ice jams can occur on the and two mapped ice jams are in Townshend Flooding generally: Damage and debris to roads; flooding to residential properties; some stream bank collapse; streambank erosion.	Score of 4; Highly Likely

## Invasive Species: Plants and Forest Pests



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**<sup>9</sup>.

### Invasive Plant Species

<sup>9</sup> (USDA) [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/technical/ecoscience/invasive/?cid=nrcs142p2\\_011124](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/technical/ecoscience/invasive/?cid=nrcs142p2_011124)

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 Vermont<sup>10</sup>.

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) 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*)

<sup>10</sup> 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.

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 likely to wash out than natives	Mowing (endless), repeated cutting & digging (3-10 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 &	<i>Berberis thunbergii</i> & <i>B.</i>	Planted shrub,	Increases deer mice which harbor	Excavation

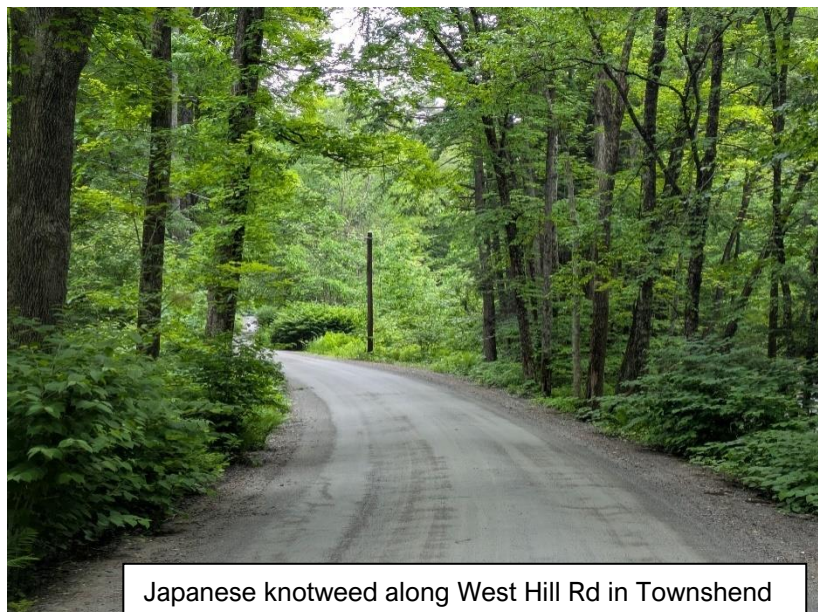
Common barberry	<i>vulgaris</i>	escapes to woods	deer ticks with Lyme disease	including roots
Burningbush	<i>Euonymus alatus</i>	Planted as ornamental, birds spread seeds to woods	Displaces native shrubs	Excavation including roots
Amur, Morrow's, Tartarian, and Bell's honeysuckle	<i>Lonicera mackii, morrowii, tatarica, 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 forest pests. 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. New roads and land clearing for development increase vulnerability to invasive species by allowing for seeds to take hold in bare soil. Erosion caused by flood events also creates this vulnerability along stream banks.

There are heavy infestations of Japanese Knotweed along the West River banks, and one plan reviewer noted it along West Hill Road. TS Irene eroded the river 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 Townshend. 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. Garlic mustard has



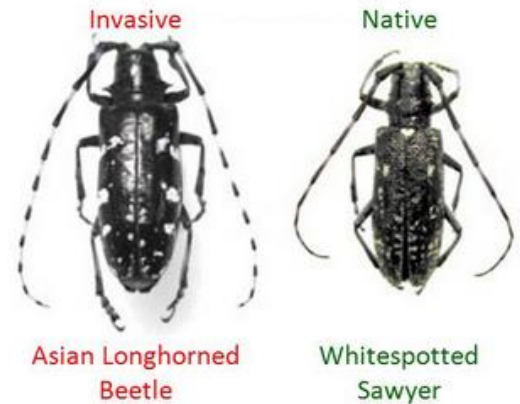
Japanese knotweed along West Hill Rd in Townshend

been found along roads. 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. Townshend does not have a Conservation Commission.

### Invasive Forest pests

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 woolly 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:

1. Brattleboro 2023
2. Dover 2025
3. Grafton 2025
4. Guilford 2023
5. Halifax 2023
6. Londonderry 2019
7. Marlboro 2024
8. Newfane 2024
9. Putney 2023
10. Readsboro 2020
11. Rockingham 2024
12. Searsburg 2025
13. Somerset 2024
14. Stratton 2024
- 15. Townshend 2022**
16. Vernon 2021
17. Wardsboro 2024
18. Westminster 2021
19. Whitingham 2023
20. Wilmington 2021



Emerald Ash borer insect

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.<sup>11</sup>

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.



Blonding with pecked holes on ash trees is a sign of EAB infestation.

<sup>11</sup> University of New Hampshire Cooperative Extension – Blonding on Ash trees information sheet. <[http://extension.unh.edu/resources/files/Resource004103\\_Rep5824.pdf](http://extension.unh.edu/resources/files/Resource004103_Rep5824.pdf)> Accessed 3/2/15.

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. 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.



Hemlock wooly adelgid presence

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.

### 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 and West Hill Road. Japanese barberry, yellow flag iris, and common and glossy buckthorn have become well established in many locations.	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
Forest pests	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 many Windham region towns and spreading; HWA is ubiquitously present in Townshend. Over half of the trees in Vermont are host species of one of these three main pests, so the	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

			potential impact is great.		
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## Wildfire

Wildfires pose a unique danger to communities and individuals. Wildfire conditions are typically most dangerous in spring when dead grass and fallen leaves from the previous year are dry and in the late summer and early fall. Drought conditions and high winds also increase the risk of wildfire. The most common cause of wildfires in Vermont is humans through burning refuse, or untended or improperly extinguished campfires. Lightning strikes are also a less common cause of fires.

FEMA has the following four categories for wildfires:

1. Wildfire: fueled by natural vegetation. These most often occur in national forestlands. Federal agencies are responsible for fire management.
2. Interface or Intermix Fires: vegetation and built environment (buildings) provide fuel for fire.
3. Firestorms: occur during extreme weather events.
4. Prescribed Fires and Prescribed Natural Fires: intentionally set for a beneficial purpose.

Most of Townshend is heavily forested and there is potential, given the right conditions, for wildfires. As residential areas expand into forested areas, fires increasingly threaten people and residences. Protecting structures in these areas from fire poses special problems and can stretch firefighting resources. Landowners are advised to keep land around buildings cut and free of trees, tall grass, debris and other items that may act as fuel for wildfire. If heavy rains follow a major forest fire, other natural disasters can occur, including landslides, mudflows, and floods. Once ground cover has been burned away, little is left to hold soil in place on steep slopes and hillsides. A major wildfire can leave a large amount of scorched and barren land, and affected areas might not return to pre-fire conditions for decades.



Because a large portion of Townshend is forested, the geographic area of the hazard covers the majority of the community. Areas prone to wildfires are described as “interface” (yellow shaded) or “intermix” (orange shaded). Interface areas can be found along the divide between urban scale development and natural areas. Townshend is characterized by “intermix” areas where residential dwellings are interspersed within heavily forested areas.

According to the Wildland Urban Interface map created for Vermont by the University of Wisconsin in 2020, specific area in town that may be more susceptible to wildfires is the land between Grafton Road, the cross-country power line right of way and Route 30, and the hillsides on the southern and northern town borders. The map to the right shows identified “intermix” areas in orange and “interface” areas in yellow.

Normally they are an acre and a half to two acres. Most stem from burning getting out of hand, some are storm related. The largest wildfire experienced in Townshend was on the mountain across the Townshend Dam from Route 30, this occurred in the late 1980’s early 90’s. Spring and Fall and uphill areas without roads intersecting, those are the most vulnerable areas. The hillsides going up towards Windham and Jamaica are areas of concern.

The Fire Chief provided data for the wildfires over the last couple of years. While the Fire Department assists with wildfires in adjacent towns as well, the following occurred in Townshend:

Address	Alarm Date Time	Incident Type	Acreage	Narrative
625 Peaked Mountain Road. Townshend	04/01/2023 20:23:33	(141) Forest, woods or wildland fire	0.0023	10' x 10'

1739 West Hill Rd. Townshend	04/12/2023 07:55:48	(142) Brush or brush-and-grass mixture fire	0.01	Small brush fire extinguished by snow.
73 Depot Rd. Townshend	06/05/2023 21:43:47	(142) Brush or brush-and-grass mixture fire	0.0017	small brush fire (15' x 5')
Riverdale Rd. Townshend	09/04/2023 14:25:53	(142) Brush or brush-and-grass mixture fire	0.01	Extinguished brush pile unattended by GPT Maintenance.
1376 Grafton Road (Velco right of way). Townshend	11/15/2024 15:16:38	(142) Brush or brush-and-grass mixture fire	0.12	Velco Pole #201B (closest pole not burned).
		<b>Total acreage</b>	<b>0.144</b>	

Climate change is anticipated to impact the likelihood of wildfire occurrence in Windham County in the future. As the region experiences warmer summer days and increasing chances of drought, the risk of wildfire will likely increase.

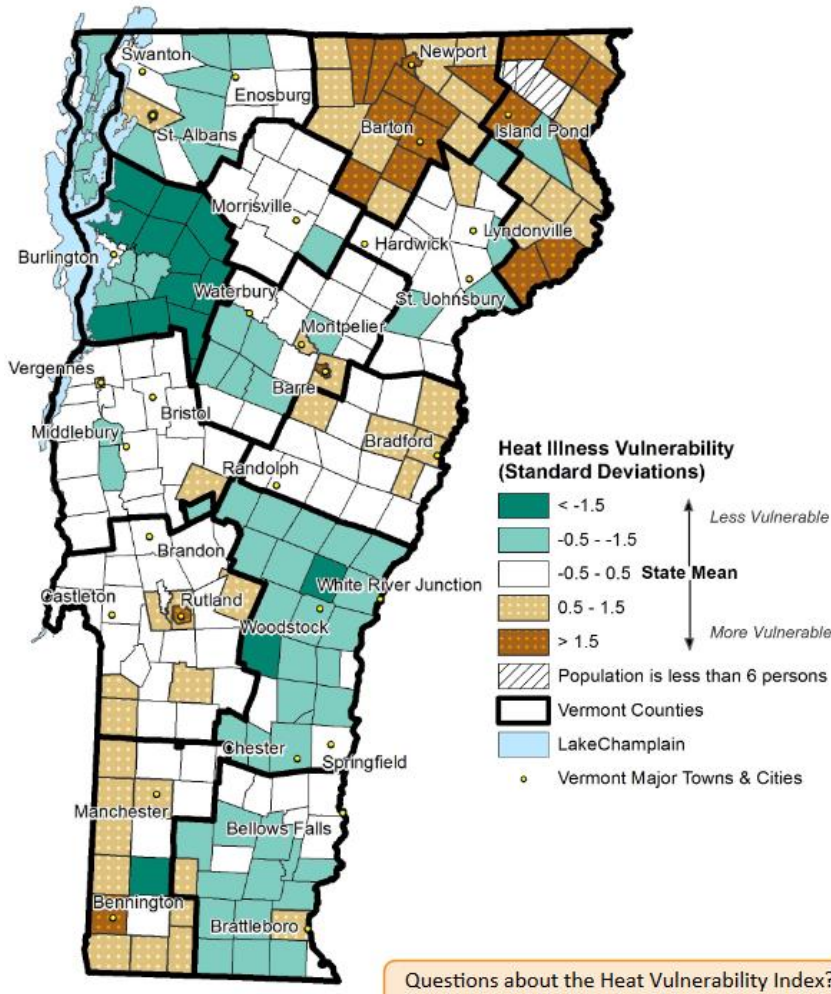
### Wildfire Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Damage to public infrastructure, utilities, private residences and businesses	The extent of wildfire risk can be hard to predict because it is so dependent on soil moisture, drought, and current weather conditions. The U.S. Forest Service maintains the Wildland Fire Assessment System, which provides national fire danger ratings and is updated daily. Danger level is ranked as low, moderate, high, very high, or severe. Wildfire conditions are typically most dangerous in spring when dead grass and fallen leaves from the previous year are dry and in the late summer and early fall.	Spring and Fall and uphill areas without roads intersecting, those are the most vulnerable areas. The hillsides going up towards Windham and Jamaica are areas of concern.	Score of 2: Possible

# 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

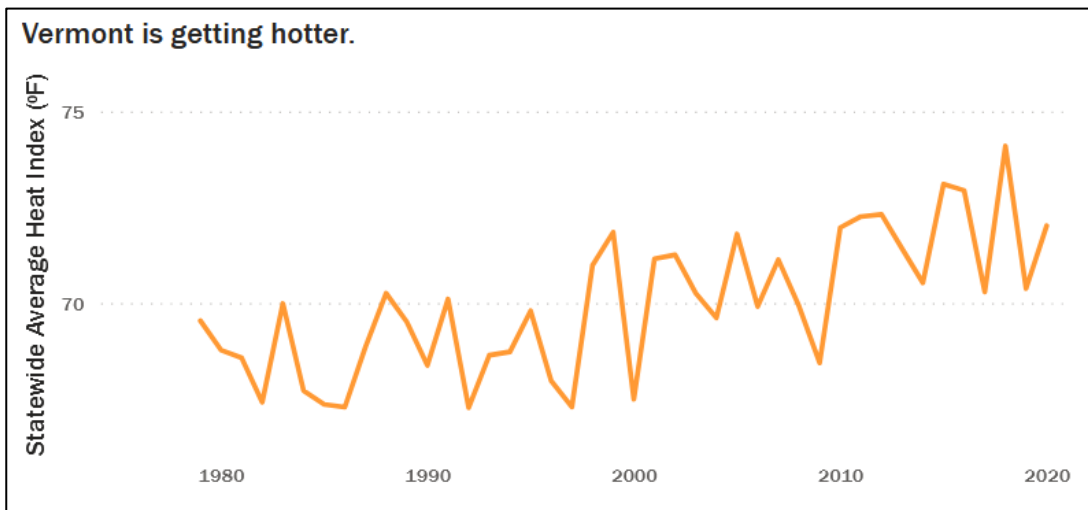
underlying conditions such as heart and respiratory disease, leading to death<sup>12</sup>. The impacts of extreme heat can be particularly challenging in areas like the Windham Region where residents are not accustomed to high temperatures and are less likely to live in air-conditioned structures.



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.

<sup>12</sup> 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.

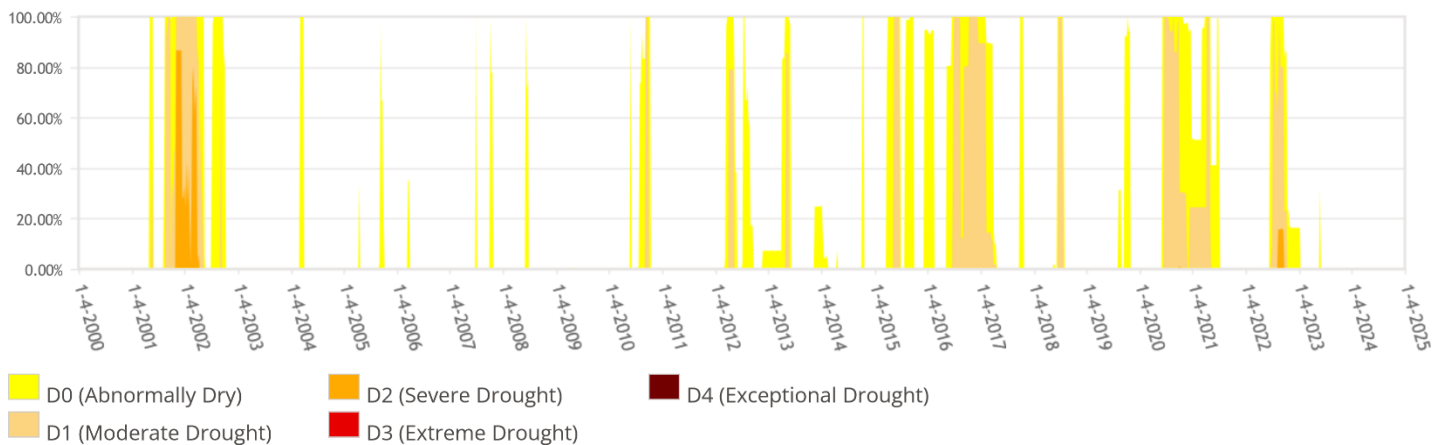
Drought can also result in loss of potable water when wells run dry. Although the surface waters may appear to have recovered from a period of drought following a return to normal precipitation, replenishing

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.<sup>13</sup>

Windham County (VT) Percent Area in U.S. Drought Monitor Categories



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.

<sup>13</sup> US Drought Monitor website: <https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx>, accessed 1/17/2024

## 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

## 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 **and** 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 Vermont State Hazard Mitigation Plan, they align in an overarching way.

Goals shown in the 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



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

vulnerability. Townshend'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, Selectboard Assistant, Treasurer, 3 Listers, Assistant Town Clerk, 5-member Highway Department, appointed Town Health Officer, and there is no Zoning Administrator.

In addition to paid staff, there is a 5-member Selectboard, 5-member Planning Commission, Tree Warden, Energy Coordinator (no one in position currently), Social Services Advisory Committee, one volunteer Fire Department, Grace Cottage Community Health Team 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 VTrans 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 September 2017 (update in process as of this writing)

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

**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.

**Flood Hazard Area Bylaw:** adopted in 2007 with FIRM update

**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 2017

**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 July 2024 (Townshend has not updated for 2025 as of writing)

**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**

**Description:** The Townshend Volunteer Fire Department's ISO rating is 8B. This rating is a score from 1 to 10 that indicates how well-protected the community is by the local fire department (1 is the highest).

**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.

### ➤ **Financial**

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

Townshend's current annual town general fund budget is \$648,735. The Highway Department FY26 budget is 1,037,386. Townshend has not received FEMA grant funding for any mitigation projects, other than the update of this Plan. The Townshend Volunteer Fire Department operates one fire house. The town funded \$58,700 to the Department in FY26, and the Department fundraises the difference to meet their base budget with no capital purchases.

### ➤ **Education and Outreach**

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

- Town website
- Townshend News community newsletter (paper and electronic)
- Front Porch Forum
- Townshend Community Facebook Page
- Brattleboro Reformer (local newspaper)
- The Commons (local newspaper)
- Townshend Public Library
- Grace Cottage Community Health Team

## **NFIP Compliance**

The Town of Townshend joined the National Flood Insurance Program (NFIP) in 1985. The Village of Townshend is not a member of the NFIP. The effective date of the current Flood Insurance Rate Map (FIRM) is September 28, 2007. 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.

Townshend'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 (only the Town)
2. Town Road and Bridge Standards
3. Local Emergency Operations Plan (not as of writing)
4. Local Hazard Mitigation Plan (expired currently)

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

***Townshend's current ERAF rate is 7.5% because they do not have in place all four base mitigation measures.***

## Identification of Mitigation Actions

The Planning Team discussed the mitigation strategy, reviewed projects from the 2015 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	Flooding / Fluvial Erosion	Organization around local floodplain administration is needed. Floodplain Administrator needs to be designated and trained.	Designate a Floodplain Administrator. Training for the Floodplain Administrator (FEMA EMI class, online STARR classes, etc.) with goal of CFM certification.	Floodplain Administrator	Ongoing	Town funds	Y	Preparedness / Maintenance / Prevention
2	Flooding / Fluvial Erosion	The SFHA bylaw will need to be updated with coming new FEMA FIRMs; adding River Corridors during that update is recommended with new Act 121 requirements starting in 2028.	Regulation of River Corridors added to the Zoning bylaw	Planning Commission	In coordination with 2025 zoning update and FIRM map update	Town funds / WRC support	N	Mitigation / Prevention
3	Flooding / Fluvial Erosion	The Town would like better communication and coordination with USACE in relation to the Townshend Dam.	Coordinate with USACE on EAP updates; yearly meetings to update contacts, talk about new hazards near the river	<b>SB Chair</b> and USACE Project Manager	starting 2025	Town funds	Y	Preparedness / Maintenance / 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 or match fund need.	Develop a Structures Fund for future unexpected projects and grant match; Increased budget item in the yearly budget	Selectboard	Budget 2026	Structures Fund	Y	Preparedness / Mitigation
5	All Hazards	Paper records are vulnerable to destruction by a variety of hazards	Digitizing all town records is a goal of the town to ensure their perpetuity. The town has completed part of this work but wants to complete it.	Town Clerk	by 2030	Town funds	N	Mitigation / Prevention

<b>Structure and Infrastructure Projects</b>								
	<b>HAZARD(S) ADDRESS- ED</b>	<b>ISSUE/ CONCERN</b>	<b>ACTION DESCRIPTION / CURRENT STATUS</b>	<b>RESPON- SIBLE ENTITIES (Lead party in bold)</b>	<b>TIME- FRAME</b>	<b>POTENTIAL FUNDING</b>	<b>Community Lifeline Connection Y/N</b>	<b>MITIGATION / PREPARED- NESS / PREVENTION / MAINTENANCE</b>
6	Flooding / Fluvial Erosion	Funding and plans in place for this project	Bridge 43 upgrade /replacements on West Hill Road	Road Foreman	Start/co mplete 2027	VTrans grant with town match	N	Mitigation
7	Flooding / Fluvial Erosion	This steep bank is slowly eroding with each event; Some repairs/ stabilization has occurred as part of repairs after events.	Complete bank stabilization on Simpson Brook Road; plantings and erosion control through armament.	Road Foreman	Constru ction by Sept 2027	Structures grant being sought	N	Mitigation / Maintenance
8	Flooding / Fluvial Erosion	Steep bank on West Hill Road is sliding off the hill and taking trees down; active slide; 60 trees down in one storm; Some repairs have been done after events but	Complete bank stabilization / rebuild on West Hill; plantings and erosion control through armament	Road Foreman	Start/co mplete 2028	Grant funding	N	Mitigation / Maintenance

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
		Scott Jensen recommended complete rebuild						
9	Flooding / Fluvial Erosion	Engineering study funding is being put together now; still need to find funding for construction	Bridge 41 upgrade/ replacements on West Hill Road	Road Foreman	2029 likely	VTrans grant with town match	N	Mitigation
10	All Hazards / Wildfire	The current fire station is dated and undersized for the need. A new station is needed at some point. Taft Meadows is the land already available and owned by the town. Finding funding is the issue.	Phase 1. Find funding for new fire station.	Fire Chief	By 2029	Grant funding, donations, and/or local bond	Yes	Maintenance / Preparedness
11	All Hazards / Wildfire	The current fire station is dated and undersized for the need. A new station is needed at some point. Finding funding is the issue.	Phase 2. Construct new fire station.	Fire Chief	By 2031	Grant funding, donations, and/or local bond	Yes	Maintenance / Preparedness
12	All Hazards	Energy efficiency upgrades, generators, power loss resilience	Install generator at the Highway Garage	<b>Emergency Management Director</b> / Road Foreman	2030 unless grant funding found before then	FEMA grant	Y	Mitigation / Preparedness

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
13	All Hazards	Energy efficiency upgrades, generators, power loss resilience; Town Hall is EOC location	Install generator at the Town Hall	EMD / <b>School Principal</b>	2030 unless grant funding found before then	FEMA grant	Y	Mitigation / Preparedness
14	All Hazards	Energy efficiency upgrades, generators, power loss resilience; School gym is also emergency shelter	Install generator at the Elementary School	EMD / <b>School Principal</b>	2030 unless grant funding found before then	FEMA grant	Y	Mitigation / Preparedness
15	Heat / All Hazards	There is no official local shelter, though Dutton Gym is the informal shelter but has had difficulty accessing in time of need.	Define a local shelter and ensure that there is an agreement in place; ideally at a location with a generator	Pam Corbett; <b>EMD</b>	2030 unless grant funding found before then	Town funding	Y	Preparedness
16	Flooding / Fluvial Erosion	Grafton Road culvert at Deer Ridge Road needs to be upsized - Major connection route for the county; more a problem of condition vs. flood hazard	Culvert Upgrade on Route 35/ Athens Road	Road Foreman	Start/co mplete 2030	Town and VTrans	N	Mitigation / Maintenance
17	All Hazards	Work with GMP to take action based on the GMP Resiliency Zone project that began in 2022	Study and assess the feasibility and cost effectiveness of creating a microgrid in Townshend	<b>Selectboard; GMP</b>	Comple t e by 2030	GMP funding	Y	Mitigation

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
18	Flooding / Fluvial Erosion	this 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 - town has 15 high priority segments left; they have completed 80% of high priority segments	<b>Road Crew</b>	ongoing process that is underway	Grants in Aid	Y	Preparedness / Prevention / Maintenance
19	Invasive Species	there are ash trees in the right of way; the town feels the situation is beyond the benefit of inventorying; plan for phased removal along roadways	Removal of Ash trees in the right of way; phased plan; first phase is to find a grant to cover costs	<b>Road Foreman;</b> some contractor support possibly needed	Dependent on grant funding	Grant	Y	Mitigation / Maintenance
20	Flooding and Fluvial Erosion	West River Corridor Plan is in development as of this writing; specific actions will be identified	Complete actions identified in West River Corridor Plan	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	RESPON-SIBLE ENTITIES (Lead party in bold)	TIME-FRAME	POTENTIAL FUNDING	Community Lifeline Connection Y/N	MITIGATION / PREPARED-NESS / PREVENTION / MAINTENANCE
21	Invasive Species	Educating residents about invasive species is one way to help control the spread	Create a flyer for the town kiosk and to be shared at campgrounds	<b>Tree Warden</b> and State Forester	2025	Town funds	N	Mitigation / Prevention

Education and Awareness Programs								
	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
22	Invasive Species	Educating residents about invasive species is one way to help control the spread	Newsletter articles from the Tree Warden on at least a yearly basis about considerations related to curbing invasive species spread	<b>Tree Warden</b> and State Forester	2025 and onward	Town funding	N	Mitigation / Prevention
23	All Hazards	CARE is a self-identification to E911 of medical needs so that prioritization and needs can be known during power outages and other hazard events	Promote CARE program to vulnerable residents	<b>EMD</b> / VT Dept. of Health	TMD yearly	VT Dept of Health funds	Y	Preparedness / Prevention
24	All Hazards	The Town would like residents to sign up for VTAlert	EMD will work with VEM to understand VTAlert sign-up rate in town and make flyers available on TMD	EMD	TMD 2026	Town funds	Y	Preparedness
25	All Hazards	There is currently no emergency management page on the town's unofficial town website.	Create an EM page on the town website (currently being developed) to house emergency related educational materials, including a list of items to have in case of emergency. Post the Floodplain Bylaw on the town website for greater public awareness of permit needs.	<b>EMD</b> and Town Website Administrator	By the end of 2027	Town funds	Y	Preparedness / Prevention

Education and Awareness Programs								
	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
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.	<b>Fire Department</b> and Highway Dept.	Dependent on grant funding	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.	<b>Fire Department</b> and Highway Dept.	10-year plan; by 2034	Fire Department funding	Y	Preparedness / Response
28	Wildfire and Drought	Public education about lowering fire risk during times of drought is something the town can increase.	Fire Department to post notifications when burn bans are in effect and educate residents on the need to get burn permits	<b>Fire Department</b>	Every wildfire season starting 2025	Fire Department funding	Y	Mitigation

## 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	Designate a Floodplain Administrator. Training for the Floodplain Administrator (FEMA EMI class, online STARR classes, etc.) with goal of CFM certification.	0	1	1	0	1	0	3	1	Yes
2	Regulation of River Corridors added to the flood hazard bylaw	0	1	1	0	1	0	3	1	Yes
3	Coordinate with USACE on EAP updates; yearly meetings to update contacts, talk about new hazards near the river	0	1	1	1	1	0	4	1	Yes
4	Develop a Structures Fund for future unexpected projects and grant match; Increased budget item in the yearly budget	0	0	1	1	1	0	3	2	Yes
5	Digitizing all town records is a goal of the town to ensure their perpetuity. The town has completed part of this work but wants to complete it.	0	1	1	1	1	0	4	1	Yes

Structure and Infrastructure Projects										
	ACTION DESCRIPTION	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
6	Bridge 43 upgrade/replacements on West Hill Road	1	1	1	1	1		5	3	Yes

<b>Structure and Infrastructure Projects</b>										
	<b>ACTION DESCRIPTION</b>	<b>Life Safety</b>	<b>Prop Protect</b>	<b>Tech</b>	<b>Political</b>	<b>Admin</b>	<b>Other Obj</b>	<b>Benefit Score</b>	<b>Est Cost</b>	<b>C/B</b>
7	Complete bank stabilization on Simpson Brook Road; plantings and erosion control through armament.	0	1	1	1	1		4	2	Yes
8	Complete bank stabilization / rebuild on West Hill; plantings and erosion control through armament	0	1	1	1	1		4	2	Yes
9	Bridge 41 upgrade/ replacements on West Hill Road	1	1	1	1	1		5	3	Yes
10	Phase 1. Find funding for new fire station.	1	1	1	0	0		3	1	Yes
11	Phase 2. Construct new fire station.	1	1	1	0	0		3	3	No
12	Install generator at the Highway Garage	0	0	1	0	1		2	2	No
13	Install generator at the Town Hall	0	0	1	0	1		2	2	No
14	Install generator at the Elementary School	0	0	1	0	1		2	2	No
15	Define a local shelter and ensure that there is an agreement in place; ideally at a location with a generator	1	0	1	1	1		4	1	Yes
16	Culvert Upgrade on Route 35/ Athens Road	1	1	1	1	1		5	3	Yes
17	Study and assess the feasibility and cost effectiveness of creating a microgrid in Townshend	1	1	1	1	0	1	5	1	Yes

<b>Natural Systems Protection and Nature-based Solutions</b>										
	<b>ACTION DESCRIPTION</b>	<b>Life Safety</b>	<b>Prop Protect</b>	<b>Tech</b>	<b>Political</b>	<b>Admin</b>	<b>Other Obj</b>	<b>Benefit Score</b>	<b>Est Cost</b>	<b>C/B</b>

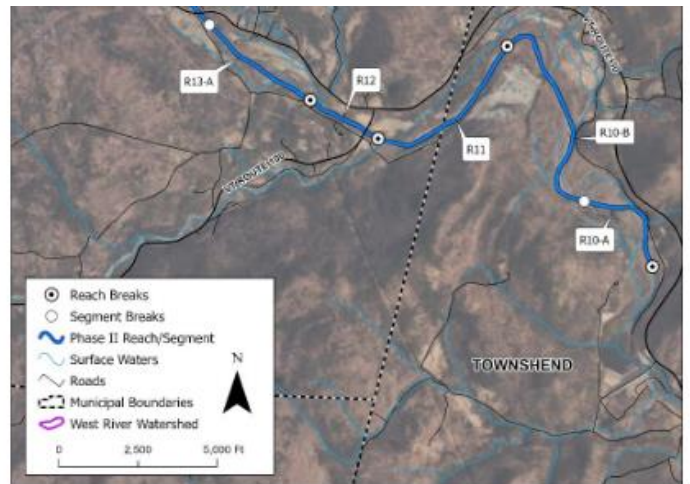
18	Complete stone line ditching - town has 15 high priority segments left; they have completed 80% of high priority segments	0	1	1	1	1		4	2	Yes
19	Removal of Ash trees in the right of way; phased plan; first phase is to find a grant to cover costs	1	1	1	1	1		5	1	Yes
20	Complete actions identified in West River Corridor Plan	0	1	1	1	1	1	5	2	Yes

<b>Education and Awareness Programs</b>										
	<b>ACTION DESCRIPTION</b>	<b>Life Safety</b>	<b>Prop Protect</b>	<b>Tech</b>	<b>Political</b>	<b>Admin</b>	<b>Other Obj</b>	<b>Benefit Score</b>	<b>Est Cost</b>	<b>C/B</b>
21	Create a flyer for the town kiosk and to be shared at campgrounds	0	1	-1	0	1		1	1	No
22	Newsletter articles from the Tree Warden on at least a yearly basis about considerations related to curbing invasive species spread	0	1	-1	0	1		1	1	No
23	Promote CARE program to vulnerable residents	1	0	-1	1	1	1	3	1	Yes
24	EMD will work with VEM to understand VTAlert sign-up rate in town and make flyers available on TMD	1	1	-1	0	1		2	1	Yes
25	Create an EM page on the town website (currently being developed) to house emergency related educational materials, including a list of items to have in case of emergency. Post the Floodplain Bylaw on the town website for greater public awareness of permit needs.	1	1	0	1	1	1	5	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	0	-1	0	1		1	3	No

Education and Awareness Programs										
	ACTION DESCRIPTION	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
27	Installation of repeaters in each fire engine; this would increase range of portable radios to that of mobile radio sets.	1	0	-1	0	1		1	3	No
28	Fire Department to post notifications when burn bans are in effect and educate residents on the need to get burn permits	0	1	1	1	1		4	1	Yes

## West River Phase 2 Stream Geomorphic Assessment and Rapid Habitat Assessment

The plan is located on the Basin 11 page of the DEC's Watershed Planning Program website<sup>14</sup>. The *West River Phase 2 SGA and RHA* was completed in 2025 by the consultant Fitzgerald Environmental Associates. The *West River Phase 2 SGA and RHA* identifies specific improvement projects. The *West River Phase 2 SGA and RHA* did not identify any projects in Townshend, however. Townshend should still review the Plan and consider ways to stabilize the waterway and increase habitat value in and along the West River.



The Phase 2 assessed reaches/segments on the West River mainstem in the towns of Jamaica and Townshend are described below (Figure 4.1).

- Reach R10
  - Reach begins just upstream of the Townshend Dam and continues upstream to a sharp bend in the river upstream of the Tannery Brook confluence. Segment A was not assessed due to being impounded by the Townshend Dam. Segment B is historically incised and is likely tail-watered by the Townshend Dam at high flows.
- Reach R11
  - Reach begins at a sharp bend in the river and continues upstream to the Wardsboro Brook confluence. The reach is historically incised and receives high sediment inputs from Wardsboro Brook.

## 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

<sup>14</sup> <https://dec.vermont.gov/water-investment/watershed-planning/basins-and-planners/basin11>

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. As of this Plan update, hazard mitigation has not been significantly integrated into other Town planning mechanisms other than adding a Flood Resilience element to the 2017 Town Plan.

### 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 2017.
<i>School Emergency Response Protocol</i>	School procedures for emergency response	Town would appreciate coordination with the School about emergency planning.

### 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.	Maintaining 5 members is ideal.
<i>Floodplain Administrator (FPA)</i>	Administrative officer responsible for administering flood hazard bylaw.	Continuing education for FPAs is always a good idea.
<i>Tree Warden</i>	Responsible for trees on public property, including town properties, schools, and within public right-of-way.	Needs Selectboard support.
<i>Selectboard</i>	Legislative body of the town for all purposes required by the state.	None identified.

<b>Capability</b>	<b>Description</b>	<b>Improvement Opportunity</b>
<i>Mutual Aid Agreements – Emergency Services</i>	Agreement for regional coordinated emergency services.	None identified. Keene Mutual Aid Dispatch for fire and rescue dispatch – written agreement/contract; State Police coverage
<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 &amp; Treasurer</i>	Responsible for receiving and recording town archives, recording deeds, filing vital statistics information, running treasury.	None identified.

### Financial Resources

<b>Capability</b>	<b>Description</b>	<b>Improvement Opportunity</b>
<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

<b>Capability</b>	<b>Description</b>	<b>Improvement Opportunity</b>
<i>National Flood Insurance Program (NFIP)</i>	Provides ability for residents to acquire flood insurance.	NFIP member in good standing.
<i>SFHA bylaws</i>	Regulates development in FEMA identified SFHAs.	Date from 2007; riparian areas are discussed. Bylaw will need to be updated in concurrence with new draft FIRMs becoming effective. Consider including River Corridor regulations in next update.
<i>Zoning</i>	Regulates the development and division of land, standards for site access and utilities	Town does not currently have Zoning, other than SFHA bylaw. Adoption of zoning should be considered.
<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.

<b>Capability</b>	<b>Description</b>	<b>Improvement Opportunity</b>
<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 updated SFHA bylaw.
<i>Sewage Regulations</i>	Regulates on-site sewage systems.	None identified. Governed by state sewage regulations.

### **Outreach and Education**

<b>Capability</b>	<b>Description</b>	<b>Improvement Opportunity</b>
<i>Town Website</i>	Municipal website providing relevant information to residents and businesses about public meetings, resources, etc.	Town should create an Emergency Management page on the unofficial town website. SFHA bylaw should be posted on the website as well.

## **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 procedure<sup>15</sup>:

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**

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<sup>15</sup> Towns can also choose to use funding in-house to develop their LHMP without outside assistance.

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. July 10, 2024 Meeting flyer and agenda
4. May 8, 2024 Meeting flyer and agenda
5. Example email sent from the Selectboard lead to town entities to invite participation in plan development
6. Email sent to adjacent towns for comment on the draft plan
7. Flyer and website notice advertising availability of Draft Hazard Mitigation Plan for public comment
8. Public and Town comments received

# 1. Mitigation Action Tracker

MITIGATION ACTION TRACKER						
Action	Information in Hazard Mitigation Plan			Current Status		
	Responsible Party	Timeframe for Completion	Funding Source	Date Began	Current Status	
1	Designate a Floodplain Administrator. Training for the Floodplain Administrator (FEMA EMI class, online STARR classes, etc.) with goal of CFM certification.	Floodplain Administrator	Ongoing	Town funds		
2	Regulation of River Corridors added to the Zoning bylaw	Planning Commission	In coordination with 2025 zoning update and FIRM map update	Town funds / WRC support		
3	Coordinate with USACE on EAP updates; yearly meetings to update contacts, talk about new hazards near the river	SB Chair and USACE Project Manager	starting 2025	Town funds		
4	Develop a Structures Fund for future unexpected projects and grant match; Increased budget item in the yearly budget	Selectboard	Budget 2026	Structures Fund		
5	Digitizing all town records is a goal of the town to ensure their perpetuity. The town has completed part of this work but wants to complete it.	Town Clerk	by 2030	Town funds		
6	Bridge 43 upgrade/ replacements on West Hill Road	Road Foreman	Start/complete 2027	VTrans grant with town match		
7	Complete bank stabilization on Simpson Brook Road; plantings and erosion control through armament.	Road Foreman	Construction by Sept 2027	Structures grant being sought		
8	Complete bank stabilization / rebuild on West Hill; plantings and erosion control through armament	Road Foreman	Start/complete 2028	Grant funding		
9	Bridge 41 upgrade/ replacements on West Hill Road	Road Foreman	2029 likely	VTrans grant with town match		

MITIGATION ACTION TRACKER						
	Action	Information in Hazard Mitigation Plan			Current Status	
		Responsible Party	Timeframe for Completion	Funding Source	Date Began	Current Status
10	Phase 1. Find funding for new fire station.	Fire Chief	By 2029	Grant funding, donations, and/or local bond		
11	Phase 2. Construct new fire station.	Fire Chief	By 2031	Grant funding, donations, and/or local bond		
12	Install generator at the Highway Garage	Emergency Management Director / Road Foreman	2030 unless grant funding found before then	FEMA grant		
13	Install generator at the Town Hall	EMD / School Principal	2030 unless grant funding found before then	FEMA grant		
14	Install generator at the Elementary School	EMD / School Principal	2030 unless grant funding found before then	FEMA grant		
15	Define a local shelter and ensure that there is an agreement in place; ideally at a location with a generator	Pam Corbett; EMD	2030 unless grant funding found before then	Town funding		
16	Culvert Upgrade on Route 35/ Athens Road	Road Foreman	Start/complete 2030	Town and VTrans grant		
17	Complete stone line ditching - town has 15 high priority segments left; they have completed 80% of high priority segments	Road Crew	ongoing process that is underway	Grants in Aid		
18	Removal of Ash trees in the right of way; phased plan; first phase is to find a grant to cover costs	Road Foreman; some contractor support possibly needed	Dependent on grant funding	Grant		
19	Complete actions identified in West River Corridor Plan	Varies	Within the 5-year planning cycle	Noted in the Plan table		
20	Create a flyer for the town kiosk and to be shared at campgrounds	Tree Warden and State Forester	2025	Town funds		
21	Newsletter articles from the Tree Warden on at least a yearly basis about considerations related to	Tree Warden and State Forester	2025 and onward	Town funding		

MITIGATION ACTION TRACKER						
	Action	Information in Hazard Mitigation Plan			Current Status	
		Responsible Party	Timeframe for Completion	Funding Source	Date Began	Current Status
	curbing invasive species spread					
22	Promote CARE program to vulnerable residents	EMD / VT Dept. of Health	TMD yearly	VT Dept of Health funds		
23	EMD will work with VEM to understand VTAlert sign-up rate in town and make flyers available on TMD	EMD	TMD 2026	Town funds		
24	Create an EM page on the town website (currently being developed) to house emergency related educational materials, including a list of items to have in case of emergency. Post the Floodplain Bylaw on the town website for greater public awareness of permit needs.	EMD and Town Website Administrator	By the end of 2027	Town funds		
25	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 Department and Highway Dept.	Dependent on grant funding	Regional grant through AFG 23		
26	Installation of repeaters in each fire engine; this would increase range of portable radios to that of mobile radio sets.	Fire Department and Highway Dept.	10-year plan; by 2034	Fire Department funding		

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

Below is an update on mitigation actions listed in the 2015 Townshend 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	Deer Ridge Road culvert is an old stone culvert that needs to be upsized	Highway Dept and VTrans	High	Not completed; No longer a priority for the Road Foreman
2	Replace decking on West Hill bridge (bridge 42)	Highway Dept and VTrans	High	Completed
3	Grafton Road culvert at Deer Ridge Road needs to be upsized - Major connection route for the county; not imminent risk of failure, but second on the list of needs	Highway Dept and VTrans	Medium	Not completed and still a priority; carried over to current update.
4	Host a presentation at Town Meeting Day to educate people about not moving firewood	Tree Warden	<del>Medium</del> High	Not completed; The priority is increased, but the Town wants this to a Town newsletter article.
5	Develop plan to address trees along the roadways right of ways, and how to mitigate and minimize impacts of invasive species.	Tree Warden and Highway Dept.	Medium	Not completed; Town is letting GMP handle this work currently
6	Bank stabilization on Simpson Brook Road; plantings and erosion control through armament. The bank is coming down slowly.	Highway Dept	High	Partially completed with repairs after events; still an action
7	Bank stabilization on West Hill; plantings and erosion control through armament	Highway Dept	<del>Medium</del> High	Partially complete; the bank is sliding off the hill and taking trees down; active slide; 60 trees down in one storm; Scott Jensen recommended complete rebuild
8	Develop program for regular tree checks and trimming as needed	Tree Warden	High	This is already and adequately handled by the Road Crew as part of normal operations

	Action	Responsible Party	Project Priority	Current Status
9	Install snow fence and discuss with landowner and Vtrans about planting trees on State Route 30 at Riverbend Farm. The state maintains the roadway, but if the state doesn't have someone in the area, and there is a flooding or snow blowing problem, then the town has to block the road with a fire truck because it's unsafe to use at times. This causes a big impact to residents across the region.	Vtrans	Medium	Not completed as envisioned; A snow fence is installed by VTrans at times and town is comfortable not pursuing this action further.

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

1	Purchased new fire truck (awaiting delivery)	Ordered in 2023; expected to be delivered September 2026
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### 3. July 10, 2024 Meeting flyer and agenda

## Update of the Townshend Hazard Mitigation Plan Public Meeting Announcement



Date: Wednesday, July 10, 2024

Time: 6:00-7:30 PM

Location: Townshend Town Hall  
2006 VT Route 30, Townshend

Come help update Townshend's Local Hazard Mitigation Plan! What hazards does the town face? What actions can the town take to lower vulnerability before the next natural hazard strikes?

For more information contact  
Alyssa Sabetto via [asabetto@windhamregion.org](mailto:asabetto@windhamregion.org) or  
802-257-4547 x113



## AGENDA FOR TODAY

### 1. Brief review of discussion at the May 8th meeting regarding hazards and their impact in Townshend

### 2. Mitigation Goals and Actions

- Review/edit 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

### 3. 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

### 4. Next Steps

4. May 8, 2024 Meeting flyer and agenda

## Update of the Townshend Hazard Mitigation Plan Public Meeting Announcement



Date: Wednesday, May 8, 2024

Time: 6:00-7:30 PM

Location: Townshend Town Hall  
2006 VT Route 30, Townshend

Come help update Townshend's Local Hazard Mitigation Plan! What hazards does the town face? What actions can the town take to lower vulnerability before the next natural hazard strikes?

For more information contact

Alyssa Sabetto via [asabetto@windhamregion.org](mailto:asabetto@windhamregion.org) or

802-257-4547 x113



## AGENDA FOR TODAY'S MEETING

### 1. Update of the current Townshend Local Hazard Mitigation Plan


- Purpose
- Process
- Brief review of existing Townshend Local Hazard Mitigation Plan

### 2. Hazards

- Hazard ranking and prioritization based on risk
- Discuss public survey results
- Discuss hazard events that have occurred since the last Plan and particular locations of concern from attendees


## 5. Example email sent from the Selectboard lead to town entities to invite participation in plan development

Response Requested: Townshend Local Hazard Mitigation Plan

 Nick Suarez <nsuarez@townshendvt.gov>  
To rmerluzzi@windhamcentral.org  
Cc Connie Holt; Alyssa Sabetto

[Reply](#) [Reply All](#) [Forward](#) [More](#)

Fri 4/19/2024 3:46 PM

 If there are problems with how this message is displayed, click here to view it in a web browser.

Greetings,


Townshend has begun the process of working with the Windham Regional Commission to update our Local Hazard Mitigation Plan. We are inviting you to join our planning team for this effort, to bring your unique perspective to a conversation centered around natural hazard vulnerability and what we can do to mitigate risk to hazards facing our community. Involvement is limited to engaging in 2 public meetings, the first of which will be held on Wednesday, May 8<sup>th</sup> from 6:00-7:30pm at the Townshend Town Hall. As well, please take a moment to complete this very brief survey: <https://forms.gle/8CufYSLqsz2YJzNNA>


A response is kindly requested as to your willingness to be involved so that we are aware of who to expect at the meeting. If there is someone else in your organization more suited to participate, please forward this to them. Reach out to the town with any questions in the meantime, and we hope to see you on May 8<sup>th</sup>!

Thank you,

Nick Suarez,  
Selectboard, Town of Townshend

Re: Conflict for second Townshend LHMP meeting date

 Nick Suarez <nsuarez@townshendvt.gov>  
To Alyssa Sabetto

 You replied to this message on 8/7/2024 9:56 AM.


Hi Alyssa,

I sent invites to the following:

- Grace Cottage Hospital
- Rescue, Inc
- VEMSA
- US Army Corps of Engineers
- Townshend Fire Department
- Townshend Road Foreman
- Townshend Elementary School
- Leland & Gray Union Middle and High School
- Townshend Library
- Townshend Planning Commission
- River Bend Farm Market
- Kindle Farm School
- Valley Cares
- West River Community Project
- Townshend Tree Wardens

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

Townshend Local Hazard Mitigation Plan for review and comment

 Alyssa Sabetto <asabetto@windhamregional.org> Reply Reply All Forward ...

To: 'Bemis, David'; emd@jamaicavermont.org; wardsborotownoffice@myfairpoint.net; newfanegarage@newfanevt.com; angielitchfield5@gmail.com; 'Grafton Administrator'; ism777oth@yahoo.com; duane.wardsboro@outlook.com; Mdesocio.brooklinevt@gmail.com; 'Hannah Regier'; brook763@comcast.net; **+ 1 other** Mon 7/7/2025 2:28 PM

Cc: 'Connie Holt'; 'Nick Suarez'

 Townshend Haz Mit Plan update 2025 DRAFT for public comment.pdf 4 MB

Hello Towns adjacent to Townshend,


Attached please find a draft of the updated Townshend Local Hazard Mitigation Plan. The Windham Regional Commission has recently worked on updating this plan with the help of the town. It is now being sent to you as an opportunity for review and comment per FEMA requirements. Please share this draft with your town Planning Commission and Selectboard. **Please provide any comments back to the Windham Regional Commission by July 21, 2025.** Please use the contact information in my signature.

I would appreciate you letting me know that you have reviewed the draft, even if you do not have comment. I appreciate your time and assistance in this matter. If you have any questions, please let me know.

Thank you,

**Alyssa Sabetto, CFM**  
*Senior Planner*  
*Windham Regional Commission*

7. Flyer and website notice advertising availability of Draft Hazard Mitigation Plan for public comment

<b>TOWNSHEND, VERMONT PERIODIC ANNOUNCEMENTS</b>	
	
<b>ANNOUNCEMENT</b>	<b>EXPIRE DATE</b>
<b>Tax rates for 2024/2025:</b> <b>Combined Residential: \$2.7689</b> <b>Combined Non-Residential: \$2.4403</b> <b>TAX RATES FOR 2025/2026 NOT YET SET</b>	<b>JULY 1, 2025</b>
<b>Townshend Local Hazard Mitigation Plan PUBLIC COMMENT PERIOD</b> The <i>draft</i> Townshend Local Hazard Mitigation Plan is now available for public review. <a href="#">You can view it, on line, here.</a> Hard copy can be made available at the Town Office. The Plan is open for comment until July 21, 2025. Anyone who would like to comment on the plan should contact Alyssa Sabetto at the Windham Regional Commission. She can be reached via phone at 802-257-4547 x113 or email at <a href="mailto:asabetto@windhamregional.org">asabetto@windhamregional.org</a> . We encourage your review and participation!	<b>July 21, 2025</b>

**Townshend Local Hazard Mitigation Plan**

**PUBLIC COMMENT PERIOD**

The draft Townshend Local Hazard Mitigation Plan is now available for public review on the town website: [unofficialtownshendvt.net](http://unofficialtownshendvt.net). Hard copy can be made available at the Town Office.



The Plan is open for comment until  
July 21, 2025.

Anyone who would like to comment on the plan should contact Alyssa Sabetto at the Windham Regional Commission. She can be reached via phone at 802-257-4547 x113 or email at [asabetto@windhamregional.org](mailto:asabetto@windhamregional.org). We encourage your review and participation!

## 8. Public and Town comments received

**From:** Townshend Library <[townshendlibrary@gmail.com](mailto:townshendlibrary@gmail.com)>  
**Sent:** Wednesday, July 2, 2025 2:29 PM  
**To:** Connie Holt <[cholt@townshendvt.gov](mailto:cholt@townshendvt.gov)>  
**Subject:** Re: Fw: Townshend Local Hazard Mitigation Plan for internal town comment until July 2nd

Hi connie,

I don't have time to read the whole thing today, so I just read the beginning and scanned it where the library was mentioned.

I thought that you might want to clarify the last Whereas. It states that it is to be compliant, but not to what organization or standard.

Thanks for the update!  
Karen

Hi Connie,

I apologize For the delay. The mitigation plan looks good to us.

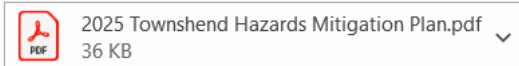
Thanks

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### 2025 Townshend Hazards Mitigation Plan



Glen Beattie <[glen33c1@gmail.com](mailto:glen33c1@gmail.com)>  
To Alyssa Sabetto



Good evening Alyssa,

Please find my changes to your draft of page 3 attached below. If you have any questions please feel free to contact me.

Regards,

Glen Beattie  
Chief  
TVFD