Local Hazard Mitigation Plan for the
Town of Westminster, Vermont
Including the Village of Westminster

Piggery Road culvert washout – July 29, 2021

FEMA Approval Pending Adoption Date:
Municipal Adoption Date:

FEMA Formal Approval Date:

Technical assistance by the Windham Regional Commission

WINDHAM
REGIONAL
COMMISSION

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INTRODUCTION AND PURPOSE

This Hazard Mitigation Plan is an update to a prior Plan adopted by the Town and approved by FEMA on May 21, 2015. This plan addresses and includes the Town's incorporated Village of Westminster. For all functional purposes the Town is responsible for all relevant services for the Village. More information about their connection is in the Town and Village Profile, and both a letter from the Chair of the Village Trustees and an email from the Town Manager (both from the 2015 plan) are included in the appendix.

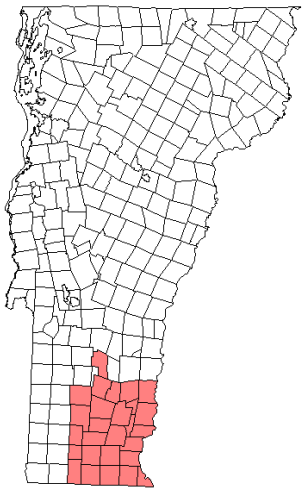
The purpose of this plan is to assist the Town of Westminster in identifying all of the hazards facing the town and to identify strategies to begin reducing risks from identified hazards.

Hazard mitigation is any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Based on the results of previous Project Impact efforts, FEMA and state agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities have opportunities to identify mitigation strategies and measures during all of the other phases of Emergency Management – preparedness, response and recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where the hazards are most severe and identify local actions that can be taken to reduce the severity of the hazard.

Hazard mitigation strategies and measures alter the hazard by eliminating or reducing the frequency of occurrence, averting the hazard by redirecting the impact by means of a structure or land treatment, adapt to the hazard by modifying structures or standards or avoid the hazard by stopping or limiting development, and could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying and modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Proactive land use planning for floodplains and other flood-prone areas
- Proper road maintenance and construction
- Ensuring critical facilities are safely located
- Establish and enforce appropriate building codes
- Public information

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.

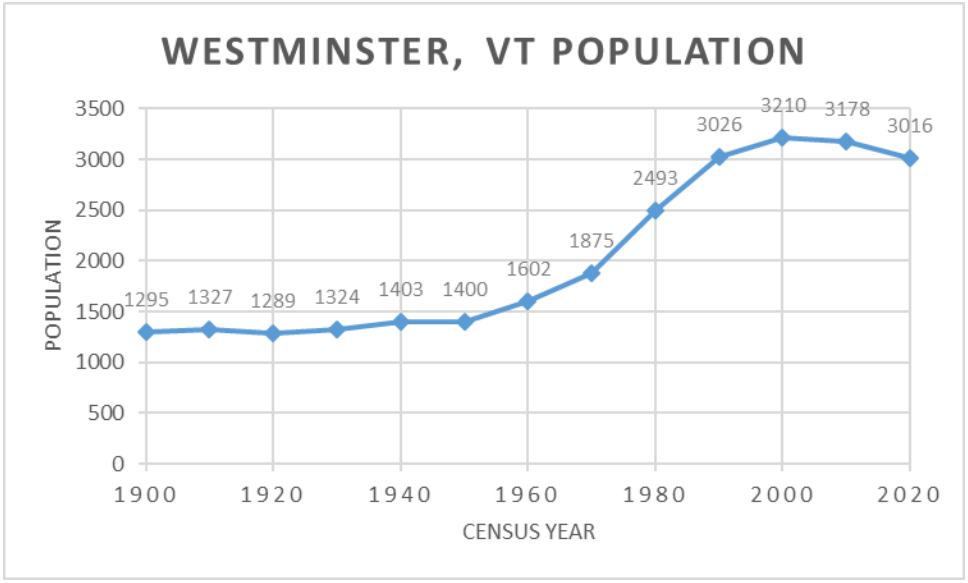
WESTMINSTER GEOGRAPHY & TOWN PROFILE

Westminster is located in Windham County, VT. The town lies on the Connecticut River, north of Putney, south of Rockingham and east of Brookline. The total land area of Westminster is 45.84 square miles (approximately 29,000 acres), roughly in the shape of a rectangle about 7 miles from north to south and averaging about 6.5 miles from east to west.

The Town is comprised of three village clusters, Westminster, Westminster West and North Westminster. The only incorporated village is the Village of Westminster. The Village of Westminster was incorporated in 1912 and held various functions over the 100+ years since, but in recent times has performed no municipal functions. The Village owns no buildings or property and has no paid staff. Its governance structure is all volunteer and consists of five trustees a treasurer and a clerk. The Village no longer collects any taxes or provides any direct services. All municipal functions within the village boundaries are, in fact, town functions. There is no official village role in maintaining facilities of any kind, nor has there been such a role for several years. As part of this, all emergency response, planning, recovery and mitigation actions are done by the Town of Westminster and the Westminster Fire District #3. In view of the Village government being a vestige of its former self, the Trustees regularly meet only annually.

Demographics

Westminster has a population of 3016 people as of the 2020 Census. The population grew in population between 1900 and 2000, followed by a slight decline between 2010 and 2020. This is shown in the adjacent graph. It



is estimated that more than half the population lives in the lower density rural areas outside of its villages.

Drinking Water and Sanitary Sewer

The Town does not operate a municipal drinking water supply or wastewater system. Residential and commercial buildings obtain drinking water from a variety of sources, including:

- Private wells or springs
- The Bellows Falls Municipal System (provides water to the Village of North Westminster, Kissell Hill and a portion of the industrial area along Route 5).
- Privately owned community systems including:
    - Westminster Aqueduct Society
    - North Westminster Water Company
    - Shady Pines Mobile Homes
    - Birch View Heights
    - New England Kurn Hattin Homes

The Westminster Aqueduct Society (formed in 1787) is the water supply for the Village of Westminster. It has been found that it frequently runs low in dry years. During wet seasons, such as the summer of 2021, the storage area runs over.

Due to soil types and the underlying geology, water resources are not easily accessible in all parts of town. Some of the industrial and commercial zones, including the area around Exit 5 off Interstate 91 where the Town Garage is located, lack easy access to a reliable water source.

Transportation Network

Westminster is home to some significant transportation infrastructure. Highway 91 goes North/South through Westminster and the town hosts interstate highway exit 5. Parallel to the Interstate is US Route 5, which also runs the length of the Town. The Town also has the only bridge access across the Connecticut River between Brattleboro and the Village of Bellows Falls. A railroad track runs along the Connecticut River through the distance of the Town, although there are no stops in Westminster.

There are about 70 miles of town-maintained Class 2 and 3 roads in Westminster, of which approximately 21 miles are Class 2 and 49 miles are Class 3 roads. Approximately 49.4 miles of the Town's road mileage is hydrologically connected, which means it 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.

While transportation access is important to development in Westminster, it also provides some challenges. The Volunteer Fire Department must respond to any interstate accidents along the highway, but they are not reimbursed by the State, which is taxing on the Town. The railroad, which carries passenger trains, also transports freight cars, which can include hazardous materials cars.

Public Safety and Emergency Management

At the start of drafting this plan, the Westminster Town Manager served in many positions, including as the Town Emergency Management Director (EMD), Zoning Administrator, Health Officer, Animal Control Officer, and Road commissioner. As of 2022, with the departure of the Town Manager, the roles are shifting. Ben Masure of the Westminster Fire Department is currently serving in the role of Emergency Management Coordinator and Public Safety Officer. Alison Bigwood, the Interim Town Manager, is serving in the other roles with involvement from the Road Foreman and Selectboard members.

The Westminster Volunteer Fire Department is responsible for municipal fire protection, fire prevention, and emergency medical services. The Department is a member of the Southwest New Hampshire District Fire Mutual Aid System, which provides dispatch services for the area fire and emergency medical agencies. The department has on-call volunteer fire and EMS personnel. The Fire Department's main facilities are located on Grout Avenue in the Village of Westminster. The Department also maintains a smaller auxiliary station in the village of Westminster West.

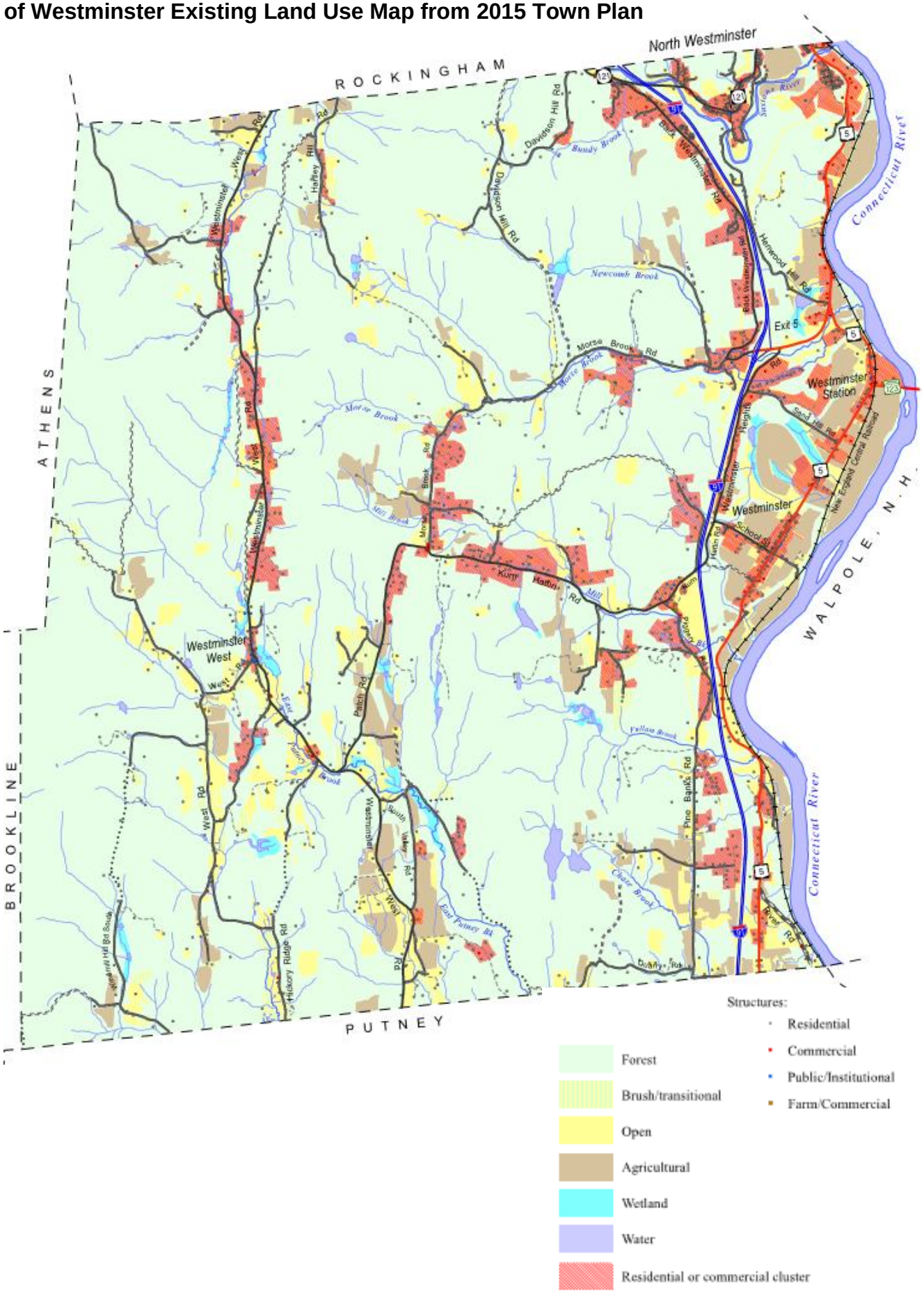
The Town Fire Department provides initial response and advanced life support patient treatment until the arrival of an ambulance service. The Town contracts with Golden Cross for ambulance service. There are no medical facilities in Westminster and, if transport to a facility is needed, Golden Cross will transport patients to either Brattleboro Memorial Hospital in Brattleboro, VT, or Springfield Hospital in Springfield, VT.

The Town of Westminster does not maintain police services and is currently contracted for part-time services with the Windham County Sheriff. The State of Vermont operates a Vermont State Police barracks in Westminster. The facility opened in July of 2016 and is located on Westminster Heights Road near Exit 5 off Interstate 91.

The Town's FEMA recognized Incident Command Center is located in the Westminster Institute on US Route 5 in the Village of Westminster. The Emergency Operations Center is a critical element during large scale emergency events and responses.

Bellows Union High School, which is located in the Town of Westminster, is the former Vermont Yankee Emergency Management Reception Center and can still be called upon to be a gathering place in a state of emergency.

Town of Westminster Existing Land Use Map from 2015 Town Plan



PLANNING PROCESS

Plan Developers

The core Hazard Mitigation Planning Team who assisted with the update of the Westminster Hazard Mitigation Plan in May and June of 2021 include:

- Russell Hodgkins – Town Manager, Zoning Administrator, Emergency Management Director, Health Officer
- Chuck Lawrence – Road Foreman
- Jim Matteau – Westminster Institute Director, Westminster Village Trustee

Representatives from Westminster institutions and residents who participated in the Hazard Mitigation Update include:

- Kelly Thayer – Town Administrative Assistant, Financial Manager, Public Information Officer
- Cole Streeter – Westminster Fire Chief, Incident Commander
- Pauline Blake-O'Brien – Town Clerk
- Kevin Hughes – Selectboard Chair
- Donna Dawson – Westminster Cares Director
- Nancy Dalzell – Westminster Village Trustee, Commission of the Campbell Fund
- John Jones – Resident, Windham Regional Commission Commissioner

This plan was supported by an Emergency Management Planning Grant funds from FEMA. Margo Ghia, Planner with the Windham Regional Commission, assisted the Town with the update.

Plan Development Process

The 2021 Westminster Local Hazard Mitigation Plan is an update to the 2015 Multijurisdictional mitigation plan. A summary of the process taken to develop the 2021 update is provided below. All public meetings were offered as hybrid meetings (with both an in-person location and a virtual option) due to the Covid-19 pandemic.

May 2021: Led by Town Manager Russell Hodgkins, members of the Town Staff provided updates on the status of mitigation actions identified in the 2015 Westminster Hazard Mitigation Plan.

May 2021: A public notice was posted on the Town website and on community notice boards that the Town was engaged in hazard mitigation planning and updating their LHMP. Email invitations and phone calls were sent to community organizational representatives and residents who live in different regions of the town.

May 24, 2021: The first of two public meetings were held. Discussed at the meeting is what a LHMP is, the benefits of hazard mitigation planning and the current plan status. The group then reviewed and confirmed the plan purpose, shared hazards encountered in Town since the last plan and identified

the highest priority natural hazards affecting the Town. There were 9 people in attendance (7 Town and/or Village employees or elected officials and 2 residents).

June 2021: An updated flyer was provided to the Town for announcing the public meeting on June 21st. the Town posted the information on the Town website and community notice boards.

June 3, 2021: A public survey was emailed to the Town Manager for distribution to attendees at the first public forum, on Front Porch Forum, as well as all Town Officials and committees. Via a phone call, the Town Manager confirmed that he sent the email to attendees at the first public forum asking them to distribute to their networks as well as Town Officials and Committee members. The survey collected information on people's perceptions of hazards affecting the town. The survey had 19 responses. A copy of the survey results is in the Appendix.

June 7, 2021: Communication sent via email to EMD's and Town Managers of all neighboring towns informing them of Westminster's Hazard Mitigation Plan process and requesting input into the development of hazard mitigation ideas. A list of people in neighboring towns who requests were sent to as well as a copy of the request is in the Appendix.

June 21, 2021: The second of two public meetings was held. The group reviewed the public survey results. They also updated mitigation actions whose status was incomplete from the previous Hazard Mitigation Plan to incorporate into the new plan. The group then identified new mitigation actions to be included in the updated plan. The group also completed work on the storm history and assets vulnerable to the highest risk natural hazards. There were 10 attendees (8 Town and Village employees or elected officials and 2 residents). One of the residents who attended brought up invasive species and requested that the Town consider adding that as a higher priority in the plan. The group agreed to add it.

September and October 2021: Margo Ghia worked on plan drafting.

October 28: The Draft Westminster LHMP was submitted to Vermont Emergency Management to assist the Town in maximizing their Emergency Relief Assistance (ERAF) rate after the July 29, 2021 event.

November 2021: The Draft Westminster LHMP was reviewed by the Town Manager.

November 2021: Margo Ghia updated the Draft LHMP based on feedback provided.

December 7, 2021: Comments received back from Vermont Emergency Management

December 2021 – May 2022: Margo Ghia reworked the draft to complete it and address comments received from Vermont Emergency Management. The revised working draft was completed by the end of May.

June 2 2022: The working draft LHMP was presented via email to the Selectboard, Town Employees, and participants who attended the public meetings for a two-week internal town review. The draft plan was also submitted to Vermont Emergency Management for an informal review.

June 14, 2022: The newly updated internal review working draft LHMP was submitted to Vermont Emergency Management for review.

June 16, 2022: The working draft LHMP went out for a two-week public comment period. The draft plan was also sent out to neighboring communities to ask for review and feedback on the plan (see appendix for the list of neighboring town contacts as well as a copy of the email sent).

July ?, 2022: Draft was discussed at a Selectboard meeting and a public comment opportunity was provided. (PENDING)

Information was gathered for the updated Westminster Local Hazard Mitigation Plan through a variety of sources. A summary of these data sources is provided below and specific references are listed throughout this Plan.

- Local knowledge of the participating Westminster Planning Team and other relevant parties
- Information from the 2015 Westminster Local Hazard Mitigation Plan
- Floodready Vermont Community reports and NFIP information
- 2015 Westminster Town Plan
- 2015-2020 Green Mountain Power Outage Data
- 2018 State of Vermont Hazard Mitigation Plan
- National Oceanic and Atmospheric (NOAA) National Climatic Data Center's Storm Events Database
- FEMA Disaster Declarations for Vermont
- FEMA NFIP Insurance Program
- FEMA Flood Insurance Maps
- U.S. Geological Survey National Water Information System- Stream Gage Data
- National Weather Service – Drought tracking
- WRC Local Liaison Reports of Storm Damage
- Vermont Invasives website, a collaborative effort between VT Department of Forest Parks and Rec, VT Department of Environmental Conservation, VT Urban and Community Forestry Program, UVM Extension and other partners.

Changes Since the 2015 Plan

As described in the Town Profile section of this Plan, the Town experienced a slight population decline between 2000 and 2020.

According to Westminster's Town Manager/Zoning Administrator, during the FY21 (July 2020 – June 2021) the Town issued 76 permits. Of those, 9 were issued for new housing units and none were for new commercial units. The FY21 year reflected previous years where there are more housing units than commercial units being created in town. Since the 2015 plan, there have been no large housing developments created. The largest new commercial development since the 2015 plan was the building of the Vermont State Police Barracks.

In 2022, the Town Manager unexpectedly left the position. The Town Manager held many important roles in the Town and was often the central person holding the knowledge of town responsibilities. After the departure, the Town is reorganizing so that there will more sharing of Town responsibilities in the future. This reorganization will continue until a new permanent Town Manager is in place.

Westminster has made progress in completing the mitigation projects identified in the 2015 Plan and that is discussed in the Implementation section of this Plan. The town has carried over mitigation actions from the 2015 that were incomplete. They have also identified new priorities based on natural events, such as drought conditions, that were experienced during the time between the last plan and this updated plan.

RISK DEVELOPMENT

The risk assessment portion of a Hazard Mitigation Plan contributes to the decision-making process for allocating available resources to mitigation projects. 44 CFR Part 201.6(c)(2) of FEMA's mitigation planning regulations requires local municipalities to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Methodology and Vulnerability Analysis

A vulnerability analysis for each community begins with an inventory of possible hazards and an assessment of the risk that they pose. These are the questions to be answered: How likely is this hazard to occur in my town? How badly could it impact my town? What areas of town would or could be affected by the hazard? This Plan update utilized the 2015 analysis ranking technique in updating the Hazard Assessment table.

The **Likelihood** (frequency of occurrence) is classified as:

- Unlikely: < 1% probability in the next 100 years.
- Possible: 1% to 10% probability in the next year, or at least one chance in the next 100 years.
- Likely: 10% to 100% probability in the next year, or at least one chance in the next 10 years.
- Highly Likely: Near 100% probability in the next year.

The **Potential Impact** (percentage of the town affected) of the hazard is classified as:

- Negligible: < 10% of properties damaged/Minimal disruption to quality of life.
- Limited: 10% to < 25% of properties damaged/Loss of essential facilities/services for up to 7 days/few (< 1% of population) injuries possible.

- Critical: 25% to 50% of properties damaged/Loss of essential facilities/services for > 7 days < 14 days/Major (< 10% of population) injuries/few deaths possible.
- Catastrophic: > 50% of properties damaged/loss of essential facilities/services for > 14 days/Severe (> 10% of population) injuries/multiple deaths possible.

Likelihood:	Potential Impact:
U = unlikely	N = negligible
P = possible	L = limited
L = likely	CR = critical
HL = highly likely	CA = catastrophic

Additional considerations in the discussion were: the impacts of climate change, seasonal weather patterns, what areas of town are likely to be affected the most, the probable duration of the hazard, the speed of onset and amount of warning time considering the existing warning systems available.

The combination of the **Likelihood** and the **Potential Impact** are used to determine the **Vulnerability Ranking** as being HIGH, MODERATE or LOW.

The hazards from the State Hazard Mitigation plan that were considered for inclusion in Westminster's Hazard Mitigation Plan by the core Hazard Mitigation Planning Team included: Fluvial Erosion, Inundation Flooding, Ice, Snow, Wind, Heat, Cold, Drought, Landslides, Wildfire, Earthquake, Invasive Species, Infectious Disease Outbreak and Hail. It is not feasible to study each hazard in depth by the Town and therefore the ranking system was used to identify the priority hazards to address. The rationale for why any listed hazard is not addressed is either: a low or moderate vulnerability ranking, the Town feels they adequately mitigate for the hazard currently, or the town does not choose to or cannot mitigate for the hazard at this time. For hazards that are not profiled in this plan (Ice, Snow, Heat, Cold, Landslides, Wildfire, Earthquake, Infectious Disease Outbreak and Hail) the reader is directed to the current Vermont State Hazard Mitigation Plan.

This Plan will focus on four high vulnerability natural hazards. These include flooding/fluvial erosion (combined into one hazard in this plan since they are intertwined), wind, drought and invasive species. Of these, fluvial erosion and high wind, were addressed in the 2015 plan. Drought was added as an area of concern. This ranked high due to a recent prolonged period of drought experienced in the region. Invasive species, while only ranking moderate in concern, was chosen to be addressed because it is rising in concern in the community and is likely to continue its upward trajectory in terms of problems for the community.

The other hazards with a high vulnerability ranking are Infectious Disease Outbreak and Significant Snow. For infectious disease, the current Covid-19 pandemic was prominent on everyone's mind since Vermont had just retracted the State of Emergency the same month as the second public meeting. However, the community decided to not address this concern in the LHMP since protocols have been to follow state guidance at this time. The other hazard that ranked high was Significant Snow. The community felt that there were current measures in place that addressed this hazard.

Hazard	Likelihood	Potential Impact	Vulnerability Rating	Vulnerability Concerns
Flooding/Fluvial Erosion	**HL**	**CR**	**High**	**Streams and brooks town wide, Roads and Infrastructure**
Wind	**HL**	**L**	**High**	**Town wide, Utilities**

Hazard	Likelihood	Potential Impact	Vulnerability Rating	Vulnerability Concerns
Drought	**HL**	**L**	**High**	**Concern for public and private water supplies. Impacts for both residential and agricultural businesses.**
Invasive Species	**HL**	**L**	**Moderate**	**Forests and fields throughout town. Impacts natural environment as well as agricultural businesses.**
Inundation Flooding	**L**	**CR**	**Moderate**	**Occurs in the Connecticut River Valley and primarily affects business.**
Significant Snow Event	HL	CR	High	Residences, Businesses, Utilities
Infectious Disease Outbreak	L	CR	High	Town wide
Ice	L	CR	Moderate	Vulnerable citizens
Heat	L	L	Moderate	Vulnerable citizens
Cold	L	L	Moderate	Unpredictable winters, People living in unprepared or vulnerable situations is the concern.
Wildfire	L	L	Low	Structures in and near wooded areas
Landslide	P	L	Low	Increasing number along waterways, most are happening slowly; infrastructure could be affected by some slides in the future; all on private land
Earthquake	U	N	Low	Town wide
Hail	P	L	Low	Agricultural Businesses

Climate change is a widely recognized hazard and it was discussed in the Plan process as to an overarching reason why some hazards appear to be becoming more severe. Climate change will be addressed in an overarching way as it impacts all hazards. The effects of climate change on the natural hazards addressed in this Plan will be discussed in the hazard profiles.

Hazard Profiles

The following sections include a narrative with a Description, Impact, Extent, Probability, and discussion of Past Occurrences of the four high vulnerability natural hazards affecting Westminster.

Inundation Flooding and Fluvial Erosion

Description

Flooding is the most widespread and destructive hazard in the United States. Flooding can occur anytime of the year as a result of heavy rains, thunderstorms, tropical storms, hurricanes or Nor'easters. 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. There is a 26 percent chance of experiencing a flood during the life of a 30-year mortgage compared to a 4 percent chance of a fire.

SFHAs are subject to inundation by the 1% annual chance flood (100-year flood). River Corridors are subject to fluvial erosion and are defined and mapped by the Vermont Agency of Natural Resources (ANR). River Corridor mapping delineates fluvial erosion hazard areas and includes a 50-foot buffer beyond those designated areas. For small streams, a 50-foot buffer from top-of-bank on either side of the waterway constitutes the River Corridor. Maps of these areas can be found at the Town Office or online at the FEMA Map Service Center[1] (SFHAs only) or on the VT ANR Natural Resources Atlas[2] (SFHAs and River Corridors).

Much of the destruction from high rain events in Westminster is due to fluvial erosion. Fluvial erosion is the destruction of river banks caused by the movement of rivers and streams, when stream power overcomes resistance of bed and bank material. 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.

Gravity and water power are the forces driving fluvial erosion. Factors that allow the force of gravity to overcome the resistance of earth material to erosion include: saturation by water, steepening of slopes by erosion or construction, alternate freezing or thawing, removal of trees and other vegetation and earthquake shaking. 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.

Bends in the river are prone to movement as part of natural river processes, and their movements can be even more dramatic when manmade impacts and development upstream impinges on these natural stabilizing forces. The interaction of the natural and unnaturally dramatic forces of river movement, combined with the stationary location of the closely located roads is what leads to road damages during heavy weather events. Property owners outside of the FEMA floodplain can purchase flood insurance at a lesser expense, and it still covers damages resulting from fluvial erosion in events that damage multiple properties.

Impact

The historic road network of many Vermont towns and villages typically follows waterways, and this is true in Westminster. This historic settlement pattern creates vulnerability for the road network, infrastructure and development within and along River Corridors.

Westminster sees frequent fluvial erosion along many of its streams and rivers. The Saxtons River, in the area of the Basin Farm in North Westminster, has significant bank erosion that is causing loss of farmland. The Mill Brook, across from Orchard Hill is causing significant erosion on the Kurn Hattin property. Over the course of its run, there are several erosion spots along Morse Brook.

If Inundation flooding occurs, it affects the floodplains of the Connecticut River Valley, where there are farms and business development. This flooding typically occurs after significant rain storms when the Connecticut River rises quickly and needs to access its floodplain. Inundation flooding is typically concentrated along the Route 5 Corridor from just north of the Village of Westminster to the border with

[1] https://msc.fema.gov/portal
[2] https://anrmaps.vermont.gov/websites/anra5/

Rockingham. The area that sees the most frequent seasonal flooding in the Spring is from where Morse Brook enters the CT River (near the highway access road) north to Harlow Farm.

There are no mapped ice jams in Westminster.[3]

A sign at Allen Brothers in Westminster marks the height of Flood waters in the wake of Tropical Storm Irene in 2011.

Extent of Flooding

The extent of a flood event can vary from a minor event due to a typical rain event or could be a major event as a result of rapid snow melt in spring, rain on frozen ground, or as a result of a tropical depression or storm. It's important to note that this Plan is looking at flooding data for this section in the light that flooding is the cause of fluvial erosion.

The highest recorded measurement at the nearest stream gauge along the Connecticut River to Westminster (across the river in North Walpole, NH) was 43.80 feet, which was measured on March 19, 1936 during the Great Flood. The second highest recording at that gauge was during TS Irene on August 29, 2011 when the gauge measured 31.38 feet. According to the National Weather Service flood stage at that gauge is 28 feet.[4]

Another stream gauge is located in the Town of Rockingham along the Saxtons River, right before it flows into Westminster. This stream gauge is USGS 01154000. The highest recorded measurement was on August 29, 2011 during Tropical Storm Irene, measuring at 19.58 feet. The second highest recording at 19.9 feet was the Great Flood of March 19, 1936. Of particular note is that the fourth highest recording at that site along the Saxtons River occurred on July 29, 2021 at 13.75 feet. According to the National Weather Service flood stage at that gauge is 10 feet.

When looking at precipitation data, the "Precipitation Frequency Estimates" table below allows one to determine the event frequency based on the rainfall amount. This table puts the July 29-30, 2021 declaration rain event (24-hour value) at between a 10 and 25-year event specifically for Westminster. It is important to remember that precipitation levels vary throughout the region.

The table below is specific for Westminster, and has the values associated with the size of an event in order to determine the storm frequency[5]. This is for reference. Westminster should consider what size event is reasonable to set standards to build to, for both infrastructure and buildings. Some experts advise that towns should be using the 10-year one hour or two-hour frequency estimates to reflect the monsoon type storms that are seen in the region. Infrastructure built for 24 hour events often can't keep up with high intensity storms leading to erosion and street flooding. This should be a consideration in the future.

[3] US Army Corps of Engineers Ice Jam Text Query < https://icejam.sec.usace.army.mil/ords/f?p=101:2>
[4] USGS Stream gauge 01154500 Connecticut River at North Walpole, NH http://waterwatch.usgs.gov/index.php.
[5] NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: Westminster, VT <https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=vt> accessed 5/30/2022.

PRECIPITATION FREQUENCY ESTIMATES										
by duration for ARI (years):	1	2	5	10	25	50	100	200	500	1000
5-min	0.279	0.33	0.413	0.481	0.576	0.648	0.723	0.804	0.916	1.01
10-min	0.395	0.467	0.584	0.682	0.816	0.918	1.02	1.14	1.3	1.42
15-min	0.465	0.549	0.687	0.803	0.961	1.08	1.2	1.34	1.53	1.67
30-min	0.663	0.781	0.974	1.13	1.35	1.52	1.69	1.88	2.15	2.36
60-min	0.862	1.01	1.26	1.47	1.75	1.96	2.18	2.42	2.76	3.04
2-hr	1.11	1.3	1.62	1.88	2.24	2.52	2.8	3.12	3.56	3.92
3-hr	1.27	1.5	1.86	2.16	2.58	2.89	3.22	3.58	4.11	4.54
6-hr	1.6	1.88	2.33	2.71	3.23	3.61	4.03	4.51	5.22	5.81
12-hr	1.97	2.32	2.88	3.34	3.98	4.45	4.97	5.59	6.54	7.36
24-hr	2.35	2.76	3.44	4.01	4.78	5.36	5.98	6.74	7.89	8.89
2-day	2.69	3.18	4	4.67	5.6	6.29	7.02	7.89	9.18	10.3
3-day	2.93	3.47	4.37	5.11	6.13	6.89	7.7	8.65	10.1	11.2
4-day	3.14	3.72	4.67	5.46	6.55	7.36	8.23	9.24	10.7	12
7-day	3.73	4.38	5.45	6.33	7.54	8.45	9.41	10.5	12.2	13.5
10-day	4.33	5.02	6.15	7.08	8.37	9.34	10.4	11.5	13.2	14.5
20-day	6.23	6.99	8.23	9.26	10.7	11.8	12.9	14	15.6	16.8
30-day	7.82	8.64	9.96	11.1	12.6	13.8	14.9	16	17.5	18.6
45-day	9.79	10.7	12.1	13.3	15	16.3	17.5	18.7	20.1	21.1
60-day	11.4	12.4	13.9	15.2	17	18.4	19.8	21	22.4	23.4

In spite of the success of the seven flood control dams built on the Connecticut River, between 1941 and 1961 the North Walpole river gauge recorded significant crests (28 to 31 feet), even though life threatening crests (35-39 feet) have not occurred since the Great Flood on 1936. Crests of 28-29 feet create “minor flooding of some farmland along the river” and “lowland flooding along the Connecticut River” from Walpole, NH (which is across the CT River from Westminster) to the Massachusetts state line, according to local sources.

Extent for Fluvial Erosion

The extent for fluvial erosion is unavailable as fluvial erosion loss has not historically been collected after flooding events. However, there have been noticeable fluvial erosion sites along the Saxtons River, Morse Brook, and Mill Brook.

During Tropical Storm Irene in 2011, the Saxtons River, with the highest stream height reading recorded at 19.5 feet, destroyed multiple homes, damaged or threatened many other residences and made cropland unusable. Roads along many stretches of the Saxtons River were flooded or damaged making travel between communities impossible. During the December 25, 2021 storm, several areas along the Saxtons River were underwater in both Rockingham and Westminster.

A large area of fluvial erosion in Westminster is along the Saxtons River. Several sites along the Saxtons River have been addressed throughout Grafton, Rockingham and Westminster with buffer plantings and bank stabilization. There still remains a few sites along the Saxtons River that should be addressed. One location in particular is at The Basin Farm in Westminster, VT. Fluvial erosion along this portion of the river is affecting farmland, recreational trails and causing sedimentation further downstream.

Smaller rivers and streams throughout Westminster experience fluvial erosion during heavy rain events. The Morse Brook, in several locations, and Mill Brook have known areas of fluvial erosion that occur after heavy rains. These, and almost all brooks near road infrastructure can cause damage to existing transportation surfaces.

Fluvial erosion site along the Saxtons River at the Basin Farm. – Photo curtesy of Peter Bergstrom.

Probability

Planning participants in this planning process deemed flooding and fluvial erosion as highly likely hazards in Westminster.

Past Occurrences

There have been 19 Presidential Disaster Declarations in Windham County since 1953, with 3 of those occurring since the last Plan update. Of these, 7 were severe storms, 5 were floods, 3 hurricanes, 1 snow event, 1 severe ice storm, and 2 are biological events (both relate to Covid-19 pandemic).[6]

Disaster Number	Incident Begin Date	Incident End Date	Declaration Date	Incident Type	Title	Disaster Close Out Date
3567	8/22/2021		8/22/2021	Hurricane	Tropical Storm Henri	
4532/ 3437	01/20/2020		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

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

Disaster Number	Incident Begin Date	Incident End Date	Declaration Date	Incident Type	Title	Disaster Close Out Date
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

Detail on Specific Flooding Events that have Affected Westminster and Windham County:
Since 1996, when National Climatic Data Center detailed records start, there have been 45 flood events in Windham County, Vermont. There have been 10 events added to the detailed records since the last plan update in 2015, with several notable events discussed below[7]. In addition to these recorded events Westminster experiences routine spring flooding, but this is not always documented.

July 29, 2021 - Night rain starting about 9:30 pm produced about 4 inches of rain in as many hours. This event caused significant road damage in Westminster, with some of the hardest hit roads being Davidson Hill, Bemis, Bump, Camp, Hartley Hill South, Henwood, Holden, McKinnon, Patch, Piggery, River, West West and Windmill Hill South. Small brooks and ditches along roads were overloaded and eroded.

Bemis Road after the July 29, 2021 Storm. – *Photo from Town Manager Russ Hodgkins.*

December 25, 2020 - An area of low pressure tracking from the Great Lakes to Hudson Bay brought in an unseasonably warm air mass into the region from Thursday, December 24 to Friday, December 25, 2020. Rain gradually overspread the region from west to east during the day on December 24 with the steadiest, heaviest rainfall during the overnight hours and early morning hours of December 25. Rain showers continued through the day on December 25 and changed to snow showers during the evening and overnight hours of December 25-26 as colder air returned. The region still dealt with nearly the entire snowpack from the blockbuster winter storm from December 16-17 which dropped 9 inches of snow. While the snow compacted over time, very little water was lost from the snow. Observations concluded that between 1.50 to 3.00 inches of water was in the snowpack prior to this event and most if not all of this snow melted. The combination of warm air,

[7] NCDC data provided on 8/18/2021 by NOAA's National Centers for Environmental Information (NCEI) Center for Weather & Climate (CWC).

rainfall and melting snowpack led to areas flooding across the region. Roads were closed across portions of southern Vermont as a result of flooding with one road being washed out. A tree was also downed onto Interstate 91 in eastern Windham County. Key Impacts: road closures, tree damage, damage to structures. In Westminster there was less damage from this storm overall, however the Saxtons River was running high and fluvial erosion and inundation flooding occurred.

2018 - A beaver dam failure occurred between Beebee Road and the West Road. The sudden dam failure drained 22 acres and the rush of water took out large sections of the West Road in Westminster and into Putney.

August 3, 2018 - A slow-moving cold front brought several rounds of heavy rainfall and thunderstorms to eastern New York and western New England. After passing through eastern New York, a severe thunderstorm knocked down trees and caused localized flash flooding in the towns of Putney, Westminster and West Wardsboro, Vermont.

October 29, 2017 - Damaging winds, power outages, heavy rainfall and flooding in the region. As the system departed, strong winds ensued and caused thousands of power outages and trees down across southern Vermont. Total rainfall amounts reported across southern Vermont ranged from 1.07 inches in Bennington to 7.01 inches near Wilmington.

June 19, 2017 - A cold front tracked east across southern Vermont during the afternoon hours of Monday, June 19th, 2017. With a warm and unstable air mass in place, the frontal passage sparked numerous showers and thunderstorms across the area. Some of these thunderstorms were severe, knocking down trees. In addition, very heavy rainfall fell across Windham County, as repeated rounds of thunderstorms produced up to four inches of rain. This led to flash flooding in Brattleboro, with several roads washed out and mudslides impacting the area. Nearly 2,00 people in Windham County lost power as a result of the thunderstorms.

August 28, 2011 - Rains from Tropical Storm Irene caused an extreme flash flooding and fluvial erosion hazard event in Southeast Vermont on August 28, 2011. The Town of Westminster saw fluvial erosion along the smaller streams and brooks as well as inundation flooding in the Connecticut River Floodplains (up to three feet across Route 5 in low places). This event was Presidential Disaster Declaration DR 4022.

April 2007 - Many Town roads throughout Westminster were washed out after flooding and severe storms rolled through the State. In Town, dirt roads were especially hard hit and limited access to residents attempting to drive throughout Town. This storm event became a presidentially declared disaster on May 5, 2007 FEMA Disaster # 1698. The total period of severe storms and flooding were during the period of April 15-21, 2007.

August 12- September 12, 2004 -- Presidential Disaster Declaration DR – 1559. This event, along with the 2003 event, triggered funding from the FEMA Public Assistance Program which helped to pay for debris removal and overtime hours for emergency response workers.

July 21 - August 18, 2003 -- led to the FEMA Declaration DR – 1488. Many roads were washed out and culverts needed replacing.

On July 16, 2000, there was a flood that caused damage. The town got 8 inches of rain in 5 hours.

Historical flood events wreaking havoc happened in the years of 1927, 1936, 1938, 1973, 1974, and 1976 causing major flooding on Route 5, and having adverse effects on culverts and bridges.

Potential Occurrences

During spring run-off, the power company in Bellows Falls, the Village north of Westminster, opens up the dam on the Connecticut River. This can cause inundation flooding in the low lying areas adjacent to the Connecticut River, particularly on Route 5 where the businesses Allen Brothers and Patriot Motors are located. Other sections of Route 5 and the RR tracks along the Connecticut River flood perpetually.

Morse Brook floods Morse Brook Road often.

The headwaters of Putney Brook cause minor flooding in the Village of Westminster West.

There are recurring flooding issues on all 40 miles of class 4 roads due to plugged culverts. If at the time of flooding, the culvert warrants replacement because it is old, the town up sizes the culvert which requires a H & H study done with VT Agency of Natural Resources.

Sources Used

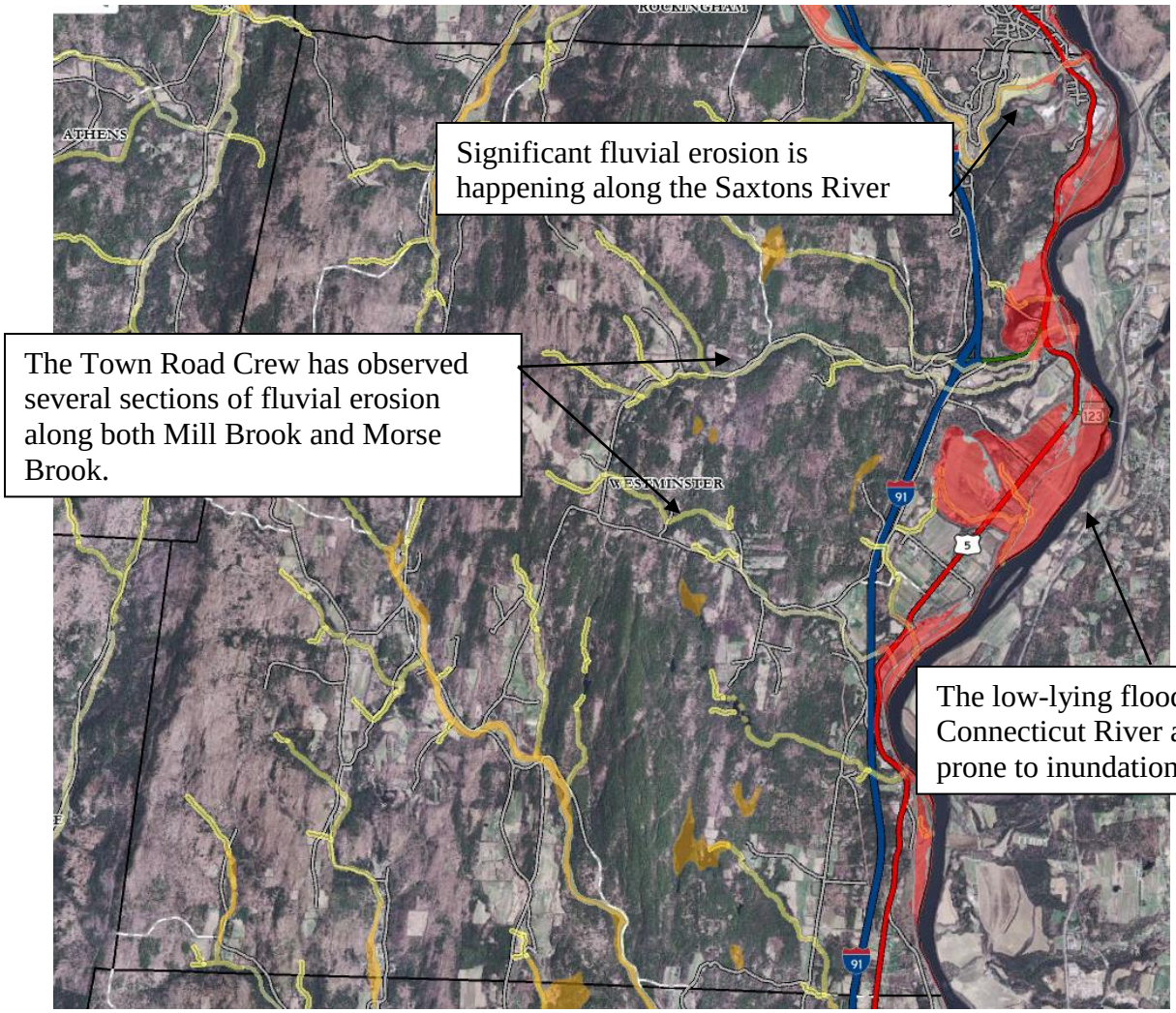
Local town knowledge and town records, National Climatic Data Center storm events database, FEMA's Presidential Disaster Declarations search page

Flooding and Fluvial Erosion Mapping

The following maps were created using the Vermont Agency of Natural Resources 'Natural Resources Atlas' which is an online mapping tool[8]. These maps show all of the special flood hazard areas (SFHAs) that FEMA has designated in Westminster. The SFHAs are shown in orange shading, and the floodways are red shaded. The floodplains shown in these maps are based on the FEMA Flood Insurance Rate Map (FIRM) maps available through the FEMA Map Service Center. The map effective date for the latest FIRM for Windham County is 9/28/2007.

The cream shaded areas on the maps are the Vermont Agency of Natural Resources (ANR) defined River Corridor which lie along streams with watersheds above .5 square miles (there are River Corridors defined for watersheds above .25 square miles, but they are not locally regulated). This area is subject to fluvial erosion. The orange shaded areas are FEMA SFHA designated A-zones, which are mapped floodplains where base flood elevations have not been determined. Red shaded areas are FEMA SFHA designated AE-zones which do have base flood elevations determined. Floodway is shown in red hatch, and is subject to moving flood waters.

[8] https://anrmaps.vermont.gov/websites/anra5/



This overall map of Westminster shows that the primary location for inundation flooding is along the CT River in the low-lying floodplains. For fluvial erosion, there is more likelihood for problems in the Saxtons River, East Putney Brook and Barnes Brook. However, fluvial erosion can occur in the river corridor along any of Westminster's rivers or streams. Westminster waterways tend to be "flashy," meaning that streams and rivers tend to rise quickly and either erode banks or access their natural floodplains. This is the case for Morse Brook and Mill Brook, where there are several areas of fluvial erosion.

HIGH WIND / TROPICAL STORM / HURRICANE

Windstorms are high-wind events that are sufficient enough to cause damage to property and can occur at any time during a year. These include high winds in conjunction with a thunderstorm and high winds that sweep through the Region after the passage of a weather front. During the past forty-six (46) years, the Region has had seventy (70) windstorms that have caused significant damages.

Description and Geographic Area of Hazard

High wind events are highly likely in Westminster, with the potential for limited resulting damage. The most likely local threats for high winds are from nor'easters, hurricanes, downbursts or wind shear. Trees downed by high winds can block roads and down power and communications lines. Mobile home parks and houses on ridge lines are at greater risk from wind damage. Most high winds events in Westminster have resulted in damage from downed trees and power lines.

Extent

Extent/magnitudes of Hurricanes and Tropical Storms are ranked using the Saffir-Simpson Scale in the Western Hemisphere, as follows: CAT1=74-95 mph winds, CAT2=96-110 mph winds, CAT3=111-130 mph winds, CAT4=131-155 mph winds, Tropical Storm=39-73 mph winds, Tropical Depression=0-38 mph winds.

During Tropical Storm Irene in August 2011, strong winds occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The strongest winds occurred from the north to northeast during the morning hours, then from the west to northwest during Sunday evening.

In February, 2006 widespread wind gusts in excess of 60 miles an hour resulted in loss of electricity to about 5,000 homes and businesses across southern Vermont.

Westminster experiences a variety of wind events, not simply hurricanes, so the Beaufort scale is also included here for reference. (NCDC: Beaufort Scale for Land. <https://www.ncdc.noaa.gov/sites/default/files/attachments/Land_Beaufort_Scale.pdf>

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

Power failure is a common event in Westminster and can occur anywhere in town. Power failures are typically a condition of High Winds and Winter Storm because power lines become damaged or are brought down by wind. Power failures may also result from disruptions in the New England or national power grid, as indicated by the widespread power outages in 2003. Dead or dying trees in close proximity to power lines pose a particular threat for power failure.

Probability

The Hazard Mitigation Plan participants ranked wind as being highly likely within any given year. Wind storms of varying degrees are experienced every year.

Past Occurrences

October 31, 2019 – Intense Halloween wind event left many trees and limbs down, taking down many power lines and snapping a couple of poles. Power outage lasted a couple of days in some places, as restoration efforts were needed region-wide.

August 21, 2019 - The National Weather Service storm survey team confirmed a high-end EF1 tornado in Windham, VT. The team found a swath of almost continuous damage in a 3/4 mile by 350-yard area. There was shingle and siding damage to several homes. Many dozens of trees were violently snapped or uprooted. Outdoor furniture, shingles and siding were tossed hundreds of yards. Based on the degree of damage, the estimated wind speed of 105 to 110 mph was determined, which is a high-end EF1 tornado.

Summer 2018 - A Micro Burst raced across Westminster from Beebee Road to Pine Banks Road following the East Putney Brook and then turning onto Daigle Road. The micro bust left a quarter mile swath of downed trees in its wake.

June 18, 2018 - A hot and humid air mass was in place across the region with temperatures in the 90s and dew points in the 60s and 70s. This resulted in heat index values reaching 100 to 110 degrees during the afternoon hours in valley areas. This air mass also resulted in an unstable environment for strong to severe thunderstorms to form ahead of a cold front passage during the afternoon and evening hours of June 18th. The storms caused numerous trees and power lines to be knocked down, resulting in over 80,000 customers without power throughout the state of Vermont.

Jul 1, 2017 - An upper-level disturbance interacted with a very moist atmosphere on July 1, generating thunderstorms across the region. These storms resulted in torrential rainfall in portions of Southern Vermont. The airport at Bennington recorded 3.47 inches of rain in four hours during the evening. This rainfall resulted in river flooding along the Walloomsac. A storm also produced a microburst in Bennington County with maximum wind speeds of 100 mph estimated.

July 19, 2013 – A very warm and humid air mass was in place over southern Vermont on Friday, July 19th. With temperatures into the 90s, the air mass was very unstable. A cold front was upstream of the region across the Great Lakes. Ahead of this front, a complex of thunderstorms developed across Lake Ontario during the evening hours of July 19th. As these thunderstorms moved eastward, they strengthened as they interacted with a lake-breeze boundary over central New York. The thunderstorms raced eastward across eastern New York and reached southern Vermont by the late evening hours. Due to the quick movement of the storms and the very unstable air mass in place, the thunderstorms produced several reports of damaging winds, mainly to trees. The thunderstorms moved east of the region by midnight, ending the threat for severe weather.

September 8, 2012 - A warm and moist southerly flow of air moved into the region in advance of a powerful cold front. The combination of partial sunshine, increasing amounts of instability and strong wind dynamics with this system placed the region into a rare Moderate Risk by the Storm Prediction Center. Several supercell thunderstorms developed earlier in the day in advance of the main squall line associated with the cold front with the potential for tornadoes, although none developed across the region. The main hazard was straight line damaging wind gusts from a squall line during the afternoon and early evening hours that resulted in numerous power outages and trees down across the area. The squall line moved east of the area later in the day.

August 28, 2011 - A Presidentially Declared Disaster, DR-4022, resulted from Tropical Storm Irene in August 2011. Tropical Storm Irene tracked north northeast across eastern New York and western New England during Sunday, August 28th, producing widespread flooding, and damaging winds across the region. Irene tracked from a position over New York City around 8 AM EST Sunday, to approximately 65 miles south of Rutland, VT at 4 PM EST. The greatest impact from Irene across southern Vermont was due to heavy to extreme rainfall, which resulted in catastrophic flooding. Rainfall amounts generally averaged 4 to 8 inches. Much of the rain which fell occurred within a 12-hour period, beginning early Sunday morning, and ending Sunday evening. This heavy to extreme rainfall resulted in widespread flash flooding and river flooding across southern Vermont. Strong winds also occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The strongest winds occurred from the north to northeast during the morning hours, then from the west to northwest during Sunday evening. The combination of strong winds, and extremely saturated soil led to numerous downed trees and power lines across the region. This also resulted in widespread long duration power outages. In particular, the approximate number of customers affected by power outages included: Windham County, 18000.

Sept. 30, 2010 - Widespread power outages were reported across Windham County, 312 reports countywide. The combination of an intensifying low-pressure system moving northward along the east coast and high pressure off the New England and mid-Atlantic Coast created a very strong pressure gradient across the region. Strong and gusty southerly winds developed as the low approached during Thursday September 30th. Winds gusts of up to 50 to 60 mph occurred across southern Vermont. This event continued through October 1st, 2010 bringing very heavy rainfall to the area. Storm total rainfall of 3 to 6 inches occurred across southern Vermont resulting in widespread urban and small stream flooding.

Oct. 29, 2006 - A low pressure system moved northeast from the Tennessee Valley into the eastern Great Lakes by Saturday evening on October 28th, and intensified rapidly before moving into eastern Canada on Sunday, October 29th. Strong southeast winds ahead of the low developed Saturday morning, with some gusts exceeding 60 mph, particularly across the higher elevations, and within channeled valley locations. Once the storm lifted into eastern Canada, strong west to northwest winds developed, with some gusts locally reaching or slightly exceeding 60 mph. The winds finally diminished across the region by Sunday evening.

Feb. 17, 2006 - At daybreak an intensifying low pressure was over the St Lawrence Valley of New York. It traveled rapidly down the St Lawrence Valley. An associated cold front moved across southern Vermont around noon. A strong pressure gradient was over the region as the cold front moved through. Widespread wind gusts in excess of 60 miles an hour resulted in loss of electricity to about 5,000 homes and businesses across southern Vermont. Some of the strong winds were associated with thunderstorms and some were not. Although, official estimates of damage were not available, based on the cost of power restoration in central Vermont from the same storm, damage may be on the order of a quarter million dollars. The strongest wind occurred at mountain top locations. A wind gust of 143 miles an hour was measured at the ski resort on Stratton Mountain, nearly 4,000 feet above sea level.

Sources used

Local knowledge

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~ShowEvent~642313

http://gis.ncdc.noaa.gov/maps/snowfall.map?view=daily

DROUGHT

Description and Geographic Area of Hazard

A drought is defined as a prolonged period of abnormally low rainfall which leads to a shortage of water. Droughts occur over a long period of time and can last for an extended period of time. Due to this extended nature of droughts, the effects on the landscape are often very different from many natural hazards. Hazards such as significant snowfall or fluvial erosion occur quickly and can produce very obvious destruction such as downed utilities and stream bank erosion. With drought conditions, the effects are not immediately obvious, are hard to monitor, and can cover extensive areas.

According to the National Weather Service, there are different types of droughts. These include

Meteorological drought is based on the degree of dryness (rainfall deficit) and the length of the dry period.

Hydrologic drought is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.

Agricultural drought is based on the impacts to agriculture by factors such as rainfall deficits, soil water deficits, reduced groundwater, or reservoir levels needed for irrigation.

Socioeconomic drought is based on the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related deficit in water supply.

While droughts are difficult to identify and do not have clearly defined start and end dates, drought conditions can cause significant damages to human and natural environments. In New England, where there is not a long history of long-lasting droughts, systems are not developed to deal with prolonged periods of little precipitation. There can be large economic implications from drought conditions.

The drought classification system ranks droughts using the following rankings:

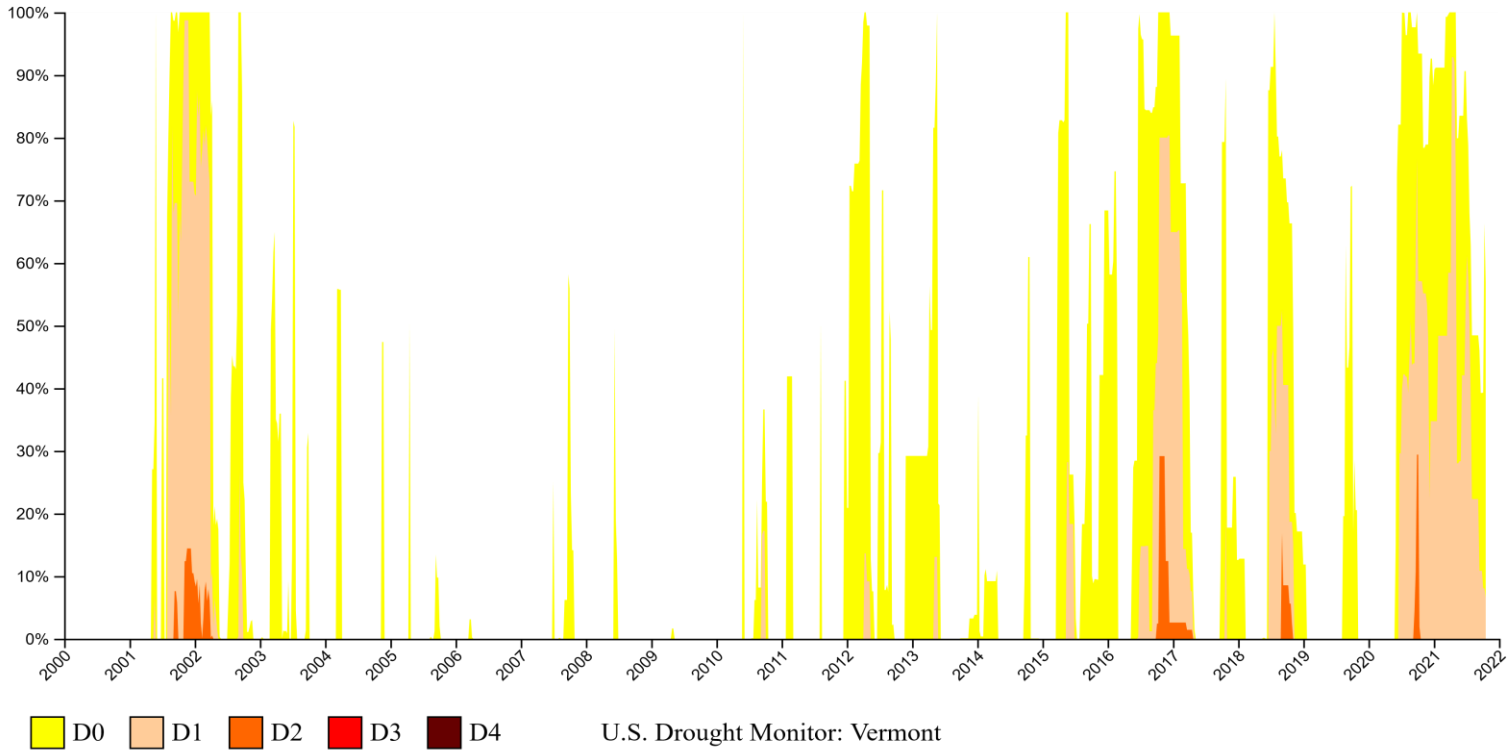
- None
- DO (Abnormally Dry)
- D1 (Moderate Drought
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Extent

The U.S. Drought Monitor, a collaboration between National Drought Mitigation Center, the National Oceanic and Atmospheric Administration, and the U.S. Department of Agriculture, was started in the year 1999, with data being published since 2000.

According to the Vermont Drought.gov site, “since 2000, the longest duration of drought (D1–D4) in Vermont lasted 71 weeks beginning on June 23, 2020, and ending on October 26, 2021. The most intense period of drought occurred the week of September 29, 2020, where D2 affected 29.39% of Vermont land.”

Vermont Drought Map 2000-2021



D0 (Abnormally Dry), D1 (Moderate Drought), D2 (Severe Drought), D3 (Extreme Drought), D4 (Exceptional Drought)

The U.S. Drought Monitor Vermont graph shows the extent of drought conditions across the State of Vermont between the years 2000- 2021

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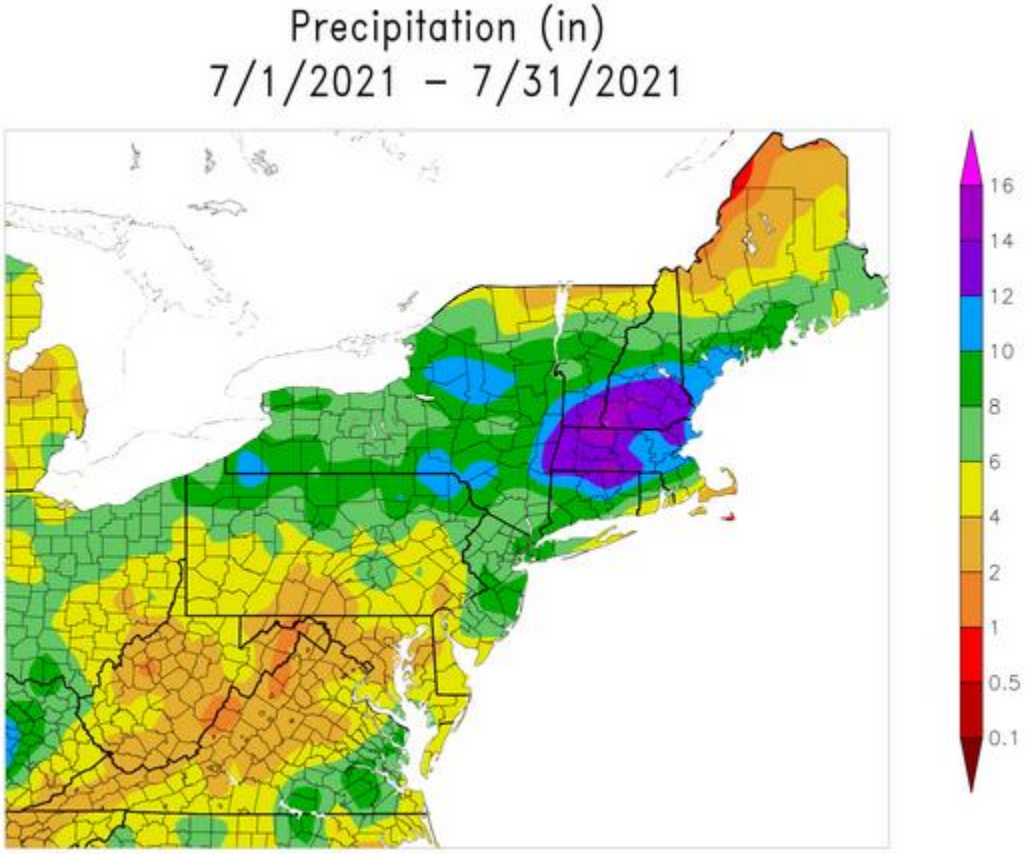
Since the year the Drought Monitor started in 2000, there have been four periods of drought conditions that reached both D3 (Extreme Drought) levels. Three of those four periods have occurred since 2017. From the limited data set, there appears to be an increasing occurrence of drought in Vermont. In climate change models, it is often predicted that New England will become wetter overall, but that the precipitation will come in more concentrated time frames with periods of dryness in between. This pattern played out in 2021 in the Town of Westminster. At the end of June 2021, Westminster was still

considered to be in category D1, Abnormally Dry, after over a year of being in dry or droughty conditions, Then July 2021 came, which saw over 300% of its normal precipitation level for the month.



This precipitation map from the Northeast Regional Climate Center, shows that Westminster, VT received between 14-16 inches of precipitation in the month of July, 2021. This is after a prolonged period of drought. Heavy rains after droughty conditions increases soil runoff.

The difficulty of receiving a higher than average level of precipitation after a long period of being abnormally dry is that you can have increased runoff from dry soils, leaving plants unable to take full advantage of the precipitation and a higher level of water reaching streams and rivers.

In Westminster, most homes and businesses receive their drinking water through private wells and springs. During drought conditions, there are increasing risks of wells and springs running low on water. In addition to the risks of inadequate water supply for both residential and commercial use, there is also the risk of low water levels in wells stirring up sediments from the bottom of wells, which can cause cloudiness, discoloration and smell. Bacteria levels should be checked from water sources that run low or dry before safe consumption of the water can resume.

The effects from prolonged drought can occur across all regions of the town. The effects seen from droughty conditions depend on the source of water and its conditions. Due to soil types and the underlying geology, water resources are not easily accessible in all parts of town. Some of the industrial and commercial zones, including the area around Exit 5 off Interstate 91 where the Town Garage is

located, lack easy access to a reliable water source. This lack of access to water becomes exaggerated during a drought.

Westminster residents and businesses are served by a variety of water systems, including private wells and springs, the Bellows Falls Municipal system, and privately-owned community systems. One of these privately-owned community systems, the Westminster Aqueduct Society, serves approximately 150 residents in the Village of Westminster. The spring and ground water providing water to the Aqueduct Society has been known to run low during dry conditions, such as in the summer of 2020.

Probability

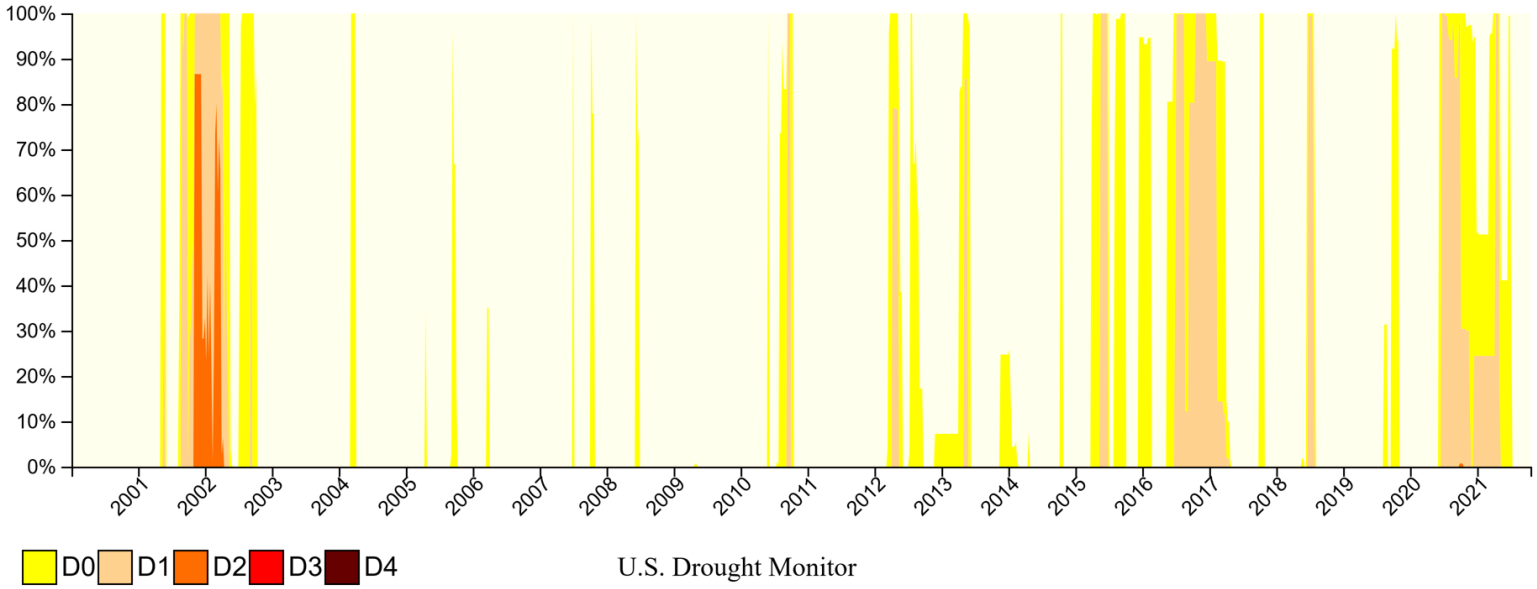
The participants in the drafting of the Local Hazard Mitigation Plan for Westminster recognized the increasing likelihood of droughts becoming more regular in the future and have identified it as Highly Likely in occurrence.

Past Occurrences

According to Drought.gov, the National Integrated Drought Information System, there have been 10 periods since the year 2000 (the year the Drought monitor began recording information) where Windham County has experienced D1 (Abnormally Dry) conditions.

The most recent extended periods of drought for Westminster include 2017 and 2020-21.

Windham County Drought Map 2000-2021



D0 (Abnormally Dry), D1 (Moderate Drought), D2 (Severe Drought), D3 (Extreme Drought), D4 (Exceptional Drought)

The U.S. Drought Monitor Windham County graph shows the extent of drought conditions across Windham County between the years 2000- 2021.

Invasive Species: Plants and Insects

Invasive plant species are a region-wide hazard; however, each location will be confronted with a distinct mix of invasive species that thrive under the particular ecological conditions of that place. Each invasive species has a different potential to spread to other areas based on the rate at which it spreads and the ecological suitability of the ecosystem that it is expanding into.

An invasive species can be defined as **an exotic species whose introduction into an ecosystem in which the species is not native and causes or is likely to cause environmental or economic harm or harm to human healt**h[9]. Another definition is **an exotic species that colonizes both disturbed and undisturbed habitats**[10]. For an example of the second definition not being met, Coltsfoot (*Tussilago farfara*) is usually only found in disturbed areas in Westminster, mainly on the edges of unpaved roads. Thus, it is not considered invasive here, since it is rare in undisturbed woods.

In contrast. Burningbush (*Euonymus alatus*), an invasive shrub often planted in local yards, has its seeds carried by birds to nearby woods, where they grow well in those undisturbed areas, crowding out native plants. The homeowner with them in their yard may not realize this spread is happening.

Keep in mind that "exotic" may be hard to define. For example, Black locust (*Robinia pseudoacacia)* is native to the US, mainly in and near the Ohio River Valley, but it is not native to Vermont. It was brought here by settlers who planted it mainly to use for fence posts. It spreads rapidly to undisturbed woods, so it is considered invasive in Vermont.

Invasive Plant Species

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

Glossy Buckthorn.

Heavy travel corridors like I-91 and US Route 5 in Westminster are also highways for the spread of invasives. Waterways and riparian areas are also corridors that invasives can overtake and spread along.

Particular invasive plant concerns for Westminster are: Glossy buckthorn which is present throughout Westminster forests; Multiflora rose in some of the older agricultural areas; Japanese barberry which is curtailing proper forest regeneration after logging; and Japanese knotweed along the banks of the Saxons and Connecticut Rivers.

[9] (USDA) https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/technical/ecoscience/invasive/?cid=nrcs142p2_011124
[10] CT Invasive Plant Working Group, https://cipwg.uconn.edu/criteria-for-listing/

The Windmill Hill Pinnacle Association, which owns 2,700 acres in Westminster and adjoining towns, is working to manage invasive plant species on their properties. They hold invasive species removal workdays each year to control buckthorn and other invasives.

Six groups of invasive plants found in the region, listed below, are thought to pose the highest threat to native plants and/or hard infrastructure[11]. Barberry is also a human health threat (Lyme disease).

Common name	**Latin name**	**Locations**	**Threats**	**Control**
Japanese Knotweed	*Fallopia japonica*	Banks of the Saxtons River and Connecticut River	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?
Asiatic (Oriental) bittersweet	*Celastrus orbiculatus*	Roadsides, other disturbed areas	Can cover utility poles, buildings, trees; displaces natives	Excavation including roots
common and glossy (European) buckthorn	*Rhamnus cathartica & R. frangula*	Clearcuts, woodland edges	Prevents regrowth of native trees	Excavation including roots
Japanese & Common barberry	*Berberis thunbergii & B. vulgaris*	Planted shrub, escapes to woods	Increases deer mice which harbor deer ticks with Lyme disease	Excavation including roots
Burningbush	*Euonymus alatus*	Planted as ornamental, birds spread seeds to forests	Displaces native shrubs	Excavation including roots
Amur, Morrow's, Tartarian, and Bell's honeysuckle	*Lonicera mackii, morrowii, tatarica, x bella*	Planted as ornamental, birds spread seeds to forests	Displaces native shrubs	Excavation including roots

Elevations generally below 1,500 feet (which includes most of Westminster) 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. 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

Invasive vines can cover utility poles and make servicing the lines, transformers, and junction boxes on them very difficult.

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

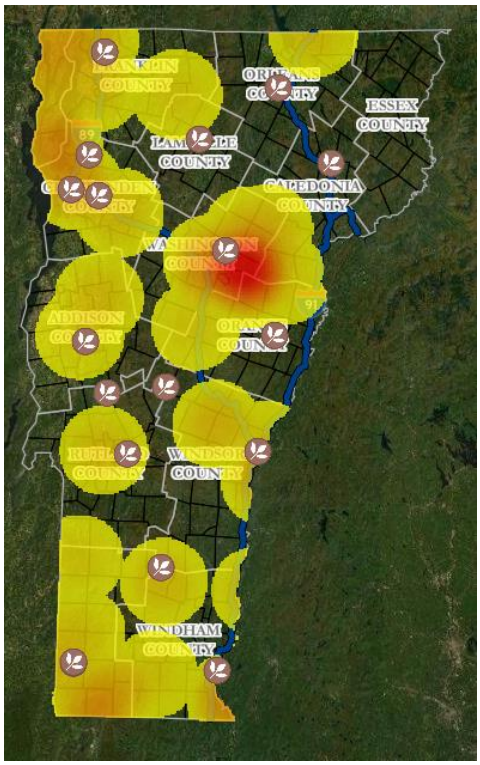
[11] This list was provided by the Rockingham Conservation Commission via Peter Bergstrom, email dated 8/31/2021.

themselves. Proper disposal of non-native vegetation is critical to avoid its spread. Avoid transporting non-native plants, including firewood and garden debris, as this is critical to prevent the spread of non-native seeds and insects. Mowing roadsides from the north to the south can also help prevent the migration of invasive seeds on-site[12].

VTinvasives.org is a great resource for towns interested in engaging in activities around invasives, including using their template to develop a custom invasive species plan for your town. The idea is to continue to create as much awareness as you can so residents know who to call when they see things. The sooner an outbreak is found, the better the chances of containment. Bio-controls are being worked out currently but aren't yet a solution. Insect pests are often found first by concerned citizens, members of the Conservation Commission, arborists and foresters.

Top Invasive Forest Pests and their Impacts

Non-native invasive species cause irreversible impacts on tree health, forest composition, and biodiversity. Three non-native insects which currently threaten Vermont are the emerald ash borer (EAB), Asian longhorned beetle (ALB) and hemlock wooly adelgid (HWA). Hemlock wooly adelgid and Emerald Ash Borer is currently present throughout the state. Initially discovered in Orange County in February 2018, Emerald ash borer (EAB) has been spread quickly and as of this writing been determined the in orange areas on the map Asian longhorned beetles are within fifty miles of Vermont's border. Over half of the trees in Vermont are host species of one of these three invasive insects.[13]



Above: Photo of Emerald Ash Borer in its adult phase.

Left: EAB Infections map obtained from VTinvasives.org and current as of 5/30//2022

[12] Vermont Fish and Wildlife Department: Wildlife Action Plan. Developed 11/22/05. Accessed 3/2/15. http://www.vtfishandwildlife.com/library/reports_and_documents/vermonts_wildlife_action_plan/_/_report/7_appendix/k_invasive_ex otic_and_pest_species.pdf

[13] vtinvasives.org (accessed 2/20/15)

Emerald ash borer

Emerald ash borer (EAB), *Agrilus planipennis*, is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002. The larvae feed in the cambium between the bark and wood, producing S-shaped galleries that girdle and kill branches and trees. Emerald ash borer probably arrived in the United States on solid wood packing material carried in cargo ships or airplanes originating in its native Asia. It first came into Detroit and killed off all the ash trees in the city, which had been planted after the city's elm trees had been killed by Dutch elm disease. The United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS) does inspections at ports and terminals, but only inspects about 7% of materials coming into the US. Emerald ash borer has spread rapidly in the United States, killing millions of trees. Emerald ash borer has been confirmed in nearby New Hampshire, putting Westminster within a 10-mile area of an active infestation. EAB has also been confirmed in other towns within the Windham Region. The eastern portion of Westminster is in what VTinvasives.org calls the "Slow the Spread Movement". Carefully planning and managing the movement of infested or potentially infested material will slow the spread and provide greater protection for uninfested forests.

White ash is one of the ten most common tree species in Vermont, so this insect will have a major impact in Vermont. EAB only feeds on Ash trees, but that is 7% of Vermont's tree species. EAB can travel faster than Asian longhorned beetle. 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.

Signs and Symptoms: Symptoms and signs include D-shaped adult exit holes, bark splitting, serpentine frass-filled (sawdust-like waste) feeding galleries, wood pecker feeding, crown dieback, and epicormic shoots (whips growing off the trunk and branches). Many of these symptoms and signs are similar to other insects and diseases of ash.

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

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.[14]

A native ground-nesting wasp, *Cerceris fumipennis*, is providing a handy solution to the EAB detection problem. This wasp will prey on the adult emerald ash borers (as well as related native beetles) and carry them, paralyzed, back to its burrow. The paralyzed beetle is then stored underground as food for the wasp's larva. Purple traps have been placed in Westminster by the State ANR to catch the EAB for early detection; none have been detected thus far.

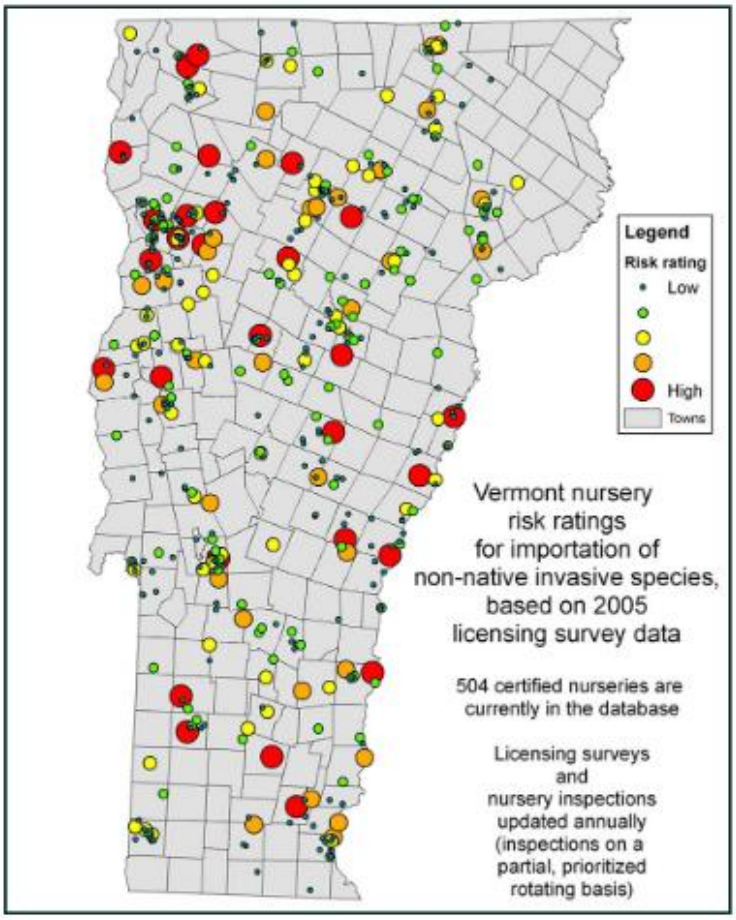
[14] University of New Hampshire Cooperative Extension – Blonding on Ash trees information sheet. <http://extension.unh.edu/resources/files/Resource004103_Rep5824.pdf> Accessed 3/2/15.

Hemlock woolly adelgid

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.

Hemlock woolly adelgid - white, cottony balls at base of hemlock needles

The HWA first arrived in the southeast U.S. and spread to the northeast through the Long Island Sound. 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.



A map, created from a research study by the Northeastern States Cooperative Region, shows locations of licensed nurseries and seasonal residences that could contribute to the importation of HWA throughout Vermont. Westminster shows a high risk of HWA importation occurring in the northeastern corner of town

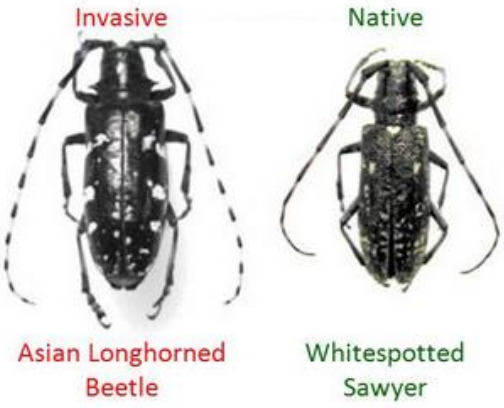
In the Windham region, it was initially found in Brattleboro and the Guilford area. It is now found in 14-15 Windham Towns, and has been recently found in Springfield in Windsor County. It has not been found in Weston, Winhall, Somerset, Searsburg or Readsboro. HWA is moving south to north in lower elevations first, and is mostly throughout southern Vermont at this point. Dead or dying hemlocks are a sadly regular sight in the region.

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

Asian longhorned beetle[15]

Asian longhorned beetle - Adults have long, black and white banded antennae.

The Asian longhorned beetle (ALB), *Anoplophora glabripennis*, is an invasive insect that feeds on certain species of hardwood trees, eventually killing them. Also known as the Starry Sky or Sky Beetle, the ALB is native to eastern Japan, and Korea. It was brought to the US, to New York City first, in packing material from Asia. ALB attacks a variety of native hardwood species, including maple, birch, elm, poplar, horse chestnut and willow. ALB prefers maples and does not like trees in the oak family. Upon hatching, the larvae tunnel through the heartwood of a host tree until fully grown. They then burrow out of the trunk as adult beetles. This process weakens the wood, making it prone to breakage, and can cause tree health to decline. Outbreaks of this beetle pose a severe threat to even perfectly healthy trees in both forests and urban and suburban landscapes. The beetle has caused tens of thousands of trees to be destroyed in Illinois, Massachusetts, New Jersey, New York and Ohio. Trees that aren't destroyed by people trying to prevent the spread are usually killed by the pest within a couple years. About half of Vermont's trees are susceptible to Asian longhorned beetle. This insect will have a major impact if it becomes established in Vermont.



Signs and Symptoms of Infestation: Oval to round wounds on the bark where the females have chewed out a site to deposit their eggs. Round emergence holes in the trunks and branches of trees. Piles of coarse sawdust at the base of trees.

The closest area to the Windham region that has the pest is Worchester County, Massachusetts, where it was discovered in 2008. They have an active quarantine and public notification campaign about the pest.[16] They are having to destroy every host tree, infected or not, and will be replanting the oaks. Boston had a small outbreak which they believe was caught in time. New York and Ohio also have quarantines in affect in their boundaries to prevent the spread. ALB has not been detected in upstate NY or in NH. It is difficult to spot infected trees from the ground, so inspectors need to climb trees. To treat wood for transport it needs to be heated to at least 160 degrees for longer than 75 minutes.

Impact

The impacts of invasive species have ripple effects that go on and on. Hemlock is a foundation tree species, and when it goes away invasive plant species tend to take over, causing wildlife habitat and water quality to decrease. Deer use hemlock stands to winter over in because of the cover a healthy tree provides, so there could be a detrimental impact to the deer population, and hunting, caused by the loss of hemlock. Hemlocks provide shade to waterways, so their loss could mean warmer streams and lower water quality, potentially impacting aquatic life. The hemlock isn't a comparatively very valuable wood product, but it is used for logging and wood products, so there are economic threats to its loss.

[15] http://www.maine.gov/dacf/php/caps/ALB/ALBdamagepics.shtml
[16] http://www.worcesterma.gov/city-manager/asian-longhorned-beetles. Accessed 3/2/15.

The large deer population is causing the loss of new trees to regenerate the forest hardwoods, thereby leaving vulnerability for invasives to come in.

Ash logs are more valuable than hemlock logs, but the bigger concern with the loss of ash is the cascading ecological impacts. There are over 40 arthropod obligate species that are threatened by the loss of ash trees (they depend on ash for their survival), and ripple effects of the loss of these arthropods and the interrelationships aren't even fully known at this point. Ash is a valuable tree for wood products and logging, so the economic impacts could be severe. Not to mention, the cost to towns for removing dead or dying trees, and the aesthetic and community open space impacts caused by their loss. Ash trees are about 12% of the forest cover in Vermont, and there are pockets of lots of ash in Rockingham. Westminster has not done an ash tree survey to know where vulnerable trees are located. They have also not completed an EAB plan. Interested private citizens can obtain purple traps for assistance with early detection of EAB on their property.

The loss of maple trees to ALB, could mean a devastation to the maple industry, which is a big industry in Vermont, including in Westminster. There are a lot of sugaring operations in Westminster, both commercial and home scale. Economic impacts could be large scale. Sap can't be used once a maple is treated with insecticide, and the lag time before it can be used again is unknown. Fall foliage tourism is a big draw for visitors to Vermont and this would be big loss of "leaf peepers" who are a big drive of the economy for the area.

Common sense policies related to preventing the spread of invasive species:

1. No one should plant or move highly invasive plants in or out of Westminster, including any part of the plants, either alive or apparently dead.
2. Safe methods (mechanical, if possible) to remove these highly invasive plants should be used where they threaten either natural or hard (human) infrastructure. The safety of using glyphosate to remove Japanese knotweed and other invasive plants is still unclear.
3. No one should move firewood in or out of Westminster, since it may include invasive insect pests (EAB, ALB, HWA, and others).

Probability

As mentioned earlier in this section, emerald ash borer and hemlock wooly adelgid are currently known to be present in the state of Vermont. Asian longhorned beetle has been found within fifty miles of Vermont's border. Westminster's proximity to a known EAB infestation area makes them highly susceptible to EAB. HWA has been confirmed in Westminster and 13-14 other towns in the Windham region. Additionally, certain invasive plant species are present in every town in the region.

Extent

Over half of the trees in Vermont are host species of one of these three main pests, so the potential impact is great. EAB only feeds on Ash trees, which are 7% of Vermont's tree species and a strong component of beech/birch forest stands. Southeastern Vermont has primarily white ash and green ash, while black ash is less common here, they are found more so to the north. Green ash is common in urban environments because they are good shade trees and do well in an urban setting. Rockingham is an example of a town in the Windham region that has planted a lot of green ash trees, so they are particularly vulnerable to EAB.

Ash planted on roadside rights of way have the highest potential for infestation of EAB. There is the potential for hundreds of dead Ash trees along roadways throughout the state and near extinction of Ash trees. The current mortality rate is 99.8% of trees. Cutting dead trees is a very hazardous activity

and the potential for a lot of dead trees along road ways is a concern for protecting public safety and infrastructure. Green Mountain Power expects EAB to severely impact their grid over time, so they are proactively removing vulnerable Ash trees near their power lines in confirmed affected areas. Areas that haven't been confirmed must contract for tree removal for trees they are concerned with.

Being proactive is key for stopping, or at least curtailing, the spread when pests are detected. Inventories of roadside ash trees are a good thing for towns to do now. Training road crews to identify threats and who to alert of outbreaks is also a good idea. Numerous towns in the Windham Region have developed EAB preparedness plans. Ash trees can be treated to prevent EAB, and weighing the cost of proactive treatment versus removal of dead trees and replacement is something a community must weigh.

There are EAB insecticides that are registered for use in VT and they are fairly effective at protecting trees, but they have to be applied to each tree individually so this isn't practical to protect all ash trees in a forest environment, but is a good option for an urban tree canopy. Additionally, trees have to be retreated every one to two years because of the insect's life cycle. ALB eradication is to cut and chip all the trees that are infested. There is another insecticide that works for ALB, but it is only effective if the tree is treated before the larvae burrow too deeply into the wood beyond the tree's vascular system. The ALB larvae spend a lot of time in the interior wood, out of the vessel system of the tree so they aren't exposed to the insecticide.

The worst example of the potential impact of ALB infestation in the U.S. is Worchester County, Massachusetts. This problem has been going on since 2008, although upon detection it was well established, as much as 15 years went by before it was discovered. The Massachusetts ALB Cooperative has confirmed a regulated area of 110 square miles, which has been expanded over time from the original 17 square miles considered infested. This area is under strict regulation by order of the Commonwealth of Massachusetts, no one can cut, move, harvest, carry, transport or ship firewood, green lumber and other material within or outside of the affected area unless authorized. These are significant restrictions, so the impact of ALB detection should be taken very seriously as it affects numerous hardwood species.

ALB can be eradicated when discovered early. It is usually found in industrial settings, because it usually arrives in pallets from an Asian shipment. ALB is now being moved around through human activities, especially through the movement of firewood. It is easier to detect ALB than EAB because the ALB is larger.

<u>Jumping Worms</u>

Jumping Worms,(Pheretimoids), also known as snake worms, are a rising invasive concern. There are approximately 19 species of earthworms known throughout Vermont. All species of earthworms are invasive to Vermont, but the recent arrival of the Jumping Worm has caused concern for Vermont forests and gardens.

Jumping Worm - smooth, glossy dark gray/brown color. Bodies are firm and not coated in "slime".

Jumping worms arrived in Vermont through horticulture, recreational fishing, and worm composting systems. Jumping Worms, or their cocoons, arrive with plant and soil materials. They are also imported to be used as live bait for fishing, or have been shipped to Vermont for use in worm composting bins.

Populations of Jumping Worms are growing rapidly. The worms are mostly parthenogenetic, so it only takes one worm to found a new colony. They are prolific reproducers, and colonies can grow quickly.

Jumping Worms pose an ecological threat to all of Vermont's forests. They feast on forest floor organic matter and the herbaceous layer, leaving the forest floor with little leaf litter, which is an essential component to the regrowth of forests and the food chain of forest animals. The change in the forest habitat structure may lead to a decline in native species and facilitate the spread of invasive plant species.

Jumping worms also pose a threat to horticulture and the maple sugar industry. Both of these economic activities are important in the Town of Westminster.

Probability

There is a high probability that Jumping Worms will continue to spread throughout Westminster and Vermont. According to Vermont Invasives, jumping worms are confirmed in all Vermont counties with the exception of Essex and Orleans. The highest causes of spread are through plant sales, perennial swaps, and fishing or composting worms being released. Worms, or their cocoons, are unknowingly being transferred from one location to another and new colonies are constantly starting.

Extent

Jumping worms have already been identified in the Town of Westminster and nearby Rockingham. As more is becoming known about this new invasive worm, more sightings are being reported. Citizen reporting on iNaturalist has a confirmed case as of 5/30/2022 in Westminster West. There are nearby reports in Rockingham near North Westminster.

Long Term Implication of Invasive Species

Invasive plants and pests are a threat to the ecology and economy of Westminster. Invasive plants are present in Westminster. Long-standing and spreading forest threats in the Windham Region are glossy buckthorn, purple loosestrife, Japanese barberry, multi-flora rose, Japanese knotweed, cow parsley, garlic mustard, and Asiatic bittersweet. There are more and more invasive plants moving up along roadways and waterways from lowland areas. All threaten forest regeneration, and multi-flora rose and Asiatic bittersweet can destroy mature trees. Smaller invasive plants such as garlic mustard, purple loosestrife, and goutweed present a threat to native herbaceous plants. The health threat posed by Japanese barberry should be noted. According to Jeffrey Ward, Chief Scientist at the Connecticut Agricultural Experiment Station, a forest infested with Japanese barberry harbors an average of 120 black-legged ticks per acre while a forest without barberry harbors an average of only 10 black-legged ticks per acre. Black-legged ticks are known to transmit the causal agents of several diseases, including Lyme disease. TS Irene spread a lot of invasive plants around the region through the transport of seed material from various sources, including flood waters. Logging, and particularly clear cutting, create areas that are particularly susceptible to invasives. Logging is recognized as an important industry in Westminster and statewide.

VTinvasives.org is a great resource for towns interested in engaging in activities around invasives, including using their template to develop a custom invasive species plan for your town.[17] The idea is to continue to create as much awareness as you can so residents know who to call when they see things. The sooner an outbreak is found, the better the chances of containment. Bio-controls are being worked out currently but aren't yet a solution. Insect pests are often found first by concerned citizens, arborists and foresters.

Sources Used
Email with VT State Forester Jim Esden on 2/21/20 (802-885-8822 or jim.esden@vermont.gov); Email with Windham County Forester Sam Schneski on 2/21/20 (sam.schneski@vermont.gov); Interview with Windham County forester Bill Guenther on 3/2/15 (802-257-7967 or bill.guenther@vermont.gov); Interview with First Detector Jordan Fletcher on 4/29/15; VT Fish and Wildlife website; VTinvasives.org; Cerceris.info webpage; Maine Forest Service webpage[18]; Images courtesy of Google images and Maine Forest Service.

ASSESSING VULNERABILITY

National Flood Insurance Program (NFIP) Participation and Compliance

The National Flood Insurance Program (NFIP) is a voluntary program organized by FEMA that includes participation from 20,000 communities nationwide and 247 Vermont towns and cities. Combined with floodplain mapping and floodplain management at the municipal level, the NFIP participation makes affordable flood insurance available to all homeowners, renters, and businesses, regardless of whether they are located in a floodplain.

The NFIP was instituted in 1968 to make flood insurance available in those communities agreeing to regulate future floodplain development. As a participant in the NFIP, a community must adopt regulations that: 1) require any new residential construction within the FEMA designated floodplain to have the lowest floor, including the basement, elevated above the 100-year flood elevation; 2) allow non-residential structures to be elevated or dry flood proofed (the flood proofing must be certified by a registered professional engineer or architect); 3) require anchoring of manufactured homes in flood prone areas. The community must also maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed.

In return for adopting floodplain management regulations, the federal government makes flood insurance available to the citizens of the community. In 1973, the NFIP was amended to mandate the purchase of flood insurance as a condition of any federally regulated, supervised or insured loan on any construction or building within the FEMA designated floodplain. In 2012, Congress passed the Biggert-Waters Flood Insurance Reform Act to reduce subsidies for structures built before the NFIP was instituted (called pre-FIRM structures). Over 50 percent of Vermont's NFIP policies are pre-FIRM, which means that flood insurance premiums for many will increase over the ensuing years.

While the NFIP floodplain management criteria are administered by states and communities through their floodplain management regulations, FEMA's role is to provide technical assistance and to monitor communities for compliance with the minimum NFIP criteria. Westminster joined the NFIP on August 16, 1974 and is a member in good standing. The latest Flood Insurance Rate Maps (FIRMs) and Flood

[17] < http://www.vtinvasives.org/tree-pests/community-preparedness>
[18] http://www.maine.gov/dacf/mfs/forest_health/invasive_threats/index.htm

Insurance Study (FIS) referred to in the development of this plan have an effective date of September 28, 2007.

The latest record indicates that there are 21 active NFIP policies in Westminster. These policies have a total value of $5,314,900[19]. There have been 11 NFIP claims filed in since 1978, with a total payout of $438,522. There are 84 structures in the SFHA and one of those is listed as a critical or public facility, although Town Officials were unsure which critical facility was in the SFHA. It is likely that the critical facility is the Allen Brother gas station. Those 84 structures represent 5% of the structures in Westminster. Only 23% of structures within the SFHA have active flood insurance policies

The Town Manager acts as the Floodplain Administrator as well as the Zoning Administrator. A zoning permit must be applied for through the Zoning Administrator before any land development begins in Westminster. The Zoning Administrator issues permits in accordance with the Towns Zoning Bylaws. According to the Westminster Zoning Bylaws, if a property is in the identified Flood Hazard Overlay District, the Development Review Board determines, after public notice and hearing, if a proposal conforms to Westminster's Zoning Bylaws Article XI, the Flood Hazard Areas Overlay District, and the State of Vermont's flood hazard regulations.

NFIP Description: The Town of Westminster has flood resilience policies and recommendations as a part of their Town Plan and currently participates in the National Flood Insurance Program which was updated Sept. 28, 2007.

NFIP Action: The Town works with the elected officials, the state and FEMA to correct existing compliance issues and prevent any further NFIP compliance issues through continuous communications, training and education.

Repetitive Loss Properties

According to the State Hazard Mitigation Officer, Westminster has no repetitive loss properties.

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. An SRL property is defined as a **residential property** that is covered under an NFIP flood insurance policy and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or

(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart. http://www.fema.gov/severe-repetitive-loss-program

[19] NFIP policy report, updated June 26, 2018: https://floodready.vermont.gov/sites/floodready/files/documents/cisrpt_NFIP%206.26.18.PDF

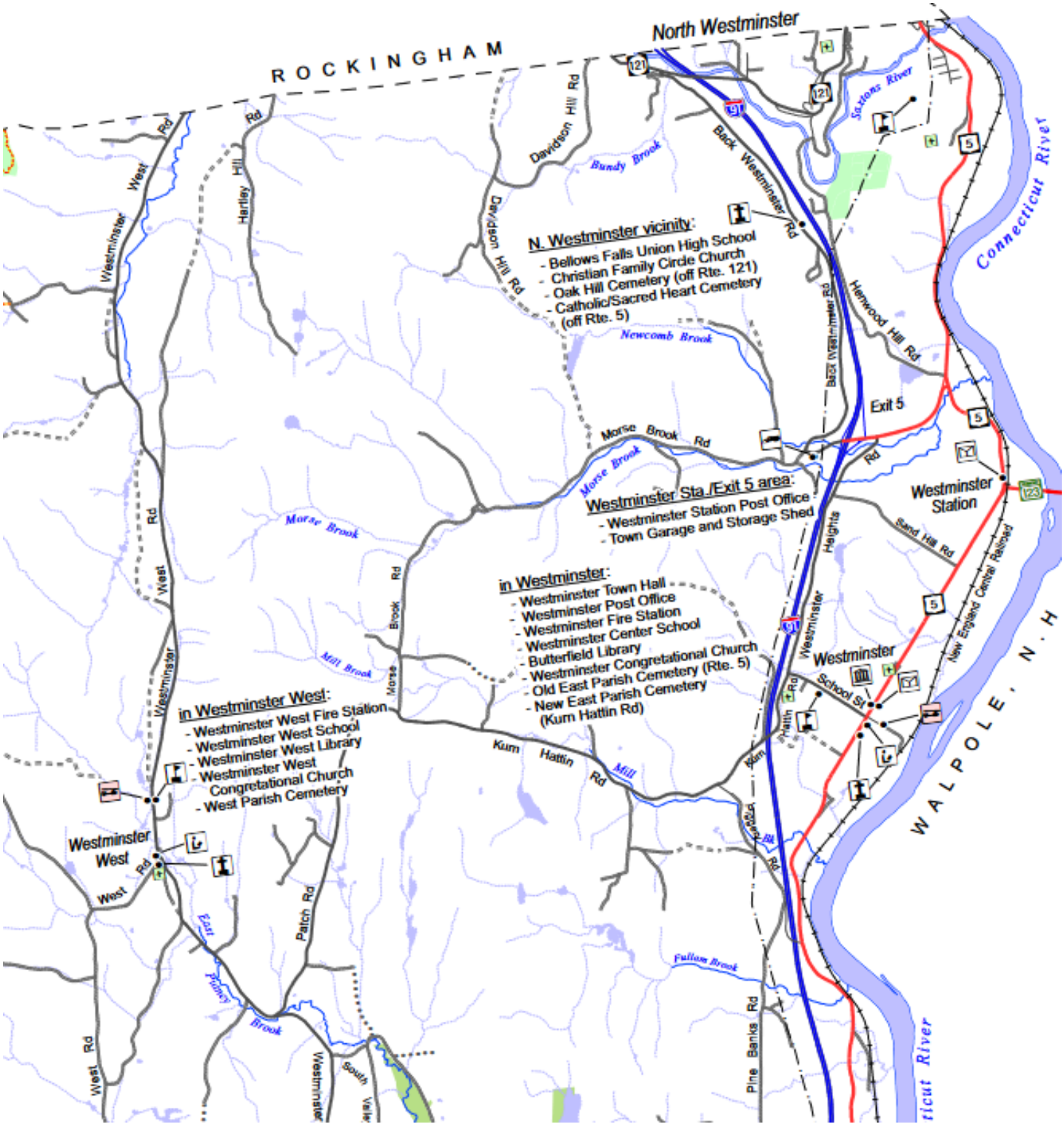
Community Assets/Facilities

From the 2019 Grand List, there are 896 homesteads on the Grand List in the Town of Westminster. Total assessed value of the homesteads is $164,748,100.

Mapping analysis shows that no community facilities or assets are located in the floodplain.

Critical Facilities	Community Gathering Places
1. Westminster Town Hall – 3651 U.S. Route 5 2. Westminster Fire Department – 103 Grout Avenue 3. Westminster Fire Department Annex – 4. Westminster Town Garage – 67 Town Garage Road 5. Westminster Center School –301 School Street 6. Westminster West School – 7. Bellows Falls Union High School – 406 High School Road 8. Compass School – 7892 U.S. Route 5 9. Kurn Hattin Homes – 708 Kurn Hattin Road 10. Westminster Institute – 3435 U. S. Route 5 11. State Police Barracks – 1330 Westminster Heights Road 12. Recycling Center – 7446 U.S. Route 5 13. National Guard Armory – 23 Armory Lane	1. Butterfield Library – 3435 U.S. Route 5 2. Westminster West Public Library – 3409 Westminster West Road 3. North Westminster Community House – 435 VT 121 4. Westminster Congregational Church – 3470 U.S. Route 5 5. Congregational Church of Westminster West – Church Street 6. Christian Family Circle – 1512 Back Westminster Road
Other Community Assets	
1. Old East Parish Cemetery – Westminster Center 2. New East Parish Cemetery – Westminster Center 3. West Parish Cemetery – Westminster West 4. Oak Hill Cemetery – North Westminster 5. Sacred Heart Cemetery – 280 Cemetery Road 6. Westminster Massacre Marker – Westminster Center 7. William French Monument – Westminster Center 8. Water Trough at Town Hall – 3651 U. S. Route 5 9. Bradley Law Office – 3651 U.S. Route 5	

Map of Community Facilities and Utilities



Development Trends

Westminster is a vibrant town, but there is little new development on an annual basis. This is like many of the small towns in southeastern Vermont. Zoning applications are up in Westminster for changes of use, subdivisions and additions to existing structures, but few for new construction. There are almost no commercial permits since 2015, however the biggest new development in Westminster since 2015 is the new Vermont State Police Barracks on Westminster Heights Road.

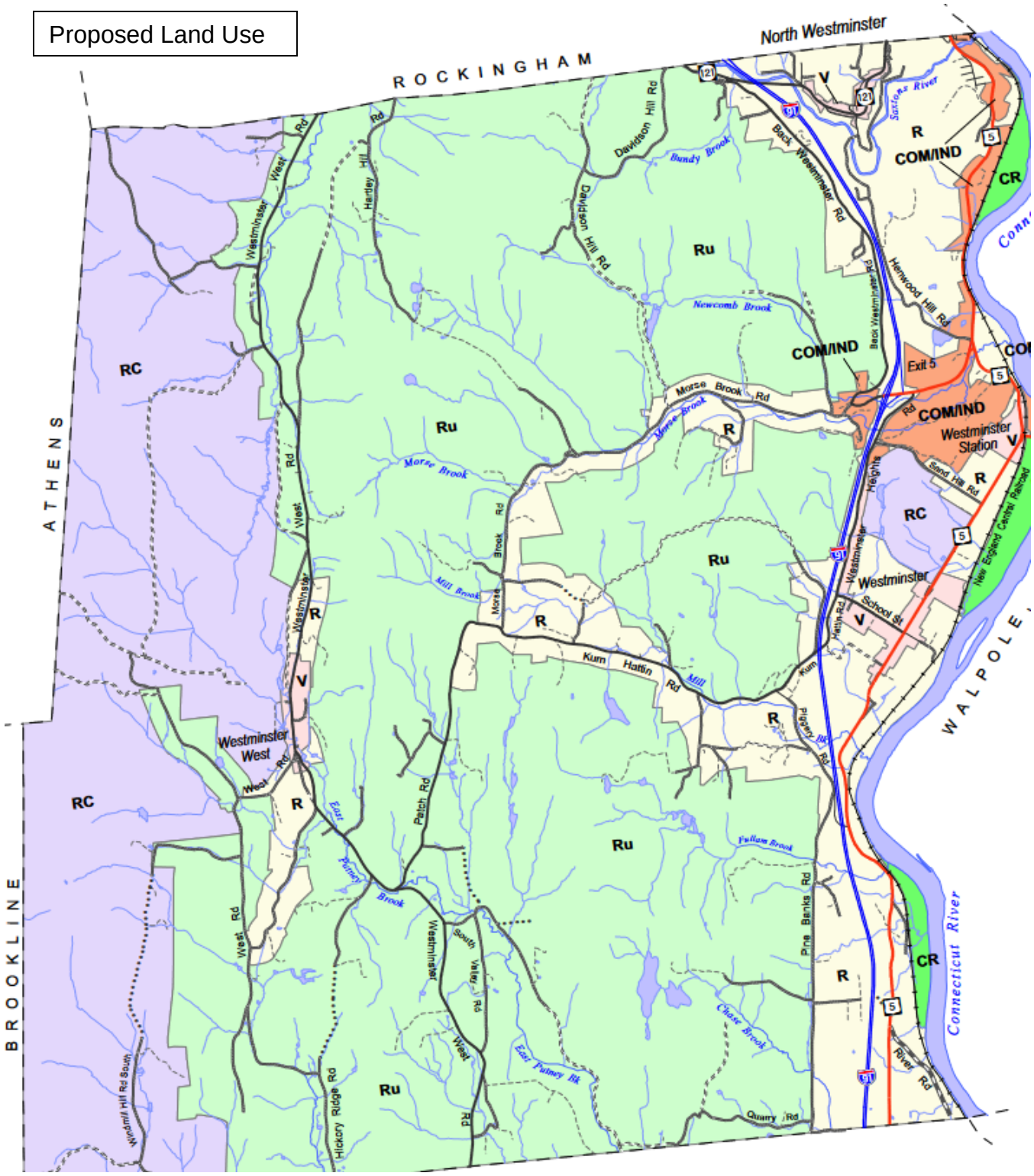
In FY 20 (July 2019 – June 2020) there were 59 permits. There were 5 new home permits and no commercial permits.

In Fy21 (July 2020-June 2021) there were 76 permits issues. Of those,9 were for new housing units. There were no commercial permits.

In FY22 (partial year, July 2021 – May 2022) there were 30 permits issued. There were permits for 2 housing units and no commercial permits.

New housing units, and even the limited commercial development, that have occurred have not increased vulnerability in the town. New development has not been permitted in the mapped flood overlay district.

Proposed Land Use



RC	Resource Conservation
CR	Connecticut River Conservation
Ru	Rural Residential
R	Residential
V	Village
COM/IND	Commercial/Industrial

MITIGATION STRATEGY

The Hazard Mitigation Goals from the prior plan were reviewed by the Hazard Mitigation Planning participants during meeting for the development of this plan. In the public meetings, the planning group reconfirmed the goals and actions as continued areas to address.

Goals

- 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.
    - Being 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 projects, such as the Town Plan, 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

Relevant Town Policies and Recommended Actions that Support Mitigation

The most recent Westminster Town Plan was adopted in 2015. It was considered in the development of this plan because it reflects the goals and ideas of Westminster. The below was taken directly from the Westminster Town Plan, adopted on October 14, 2015.

Communications Policy:
1. To provide an adequate communication system that uses facilities that take into account their visual impact and character of the Town.

Communications Recommendations:
2. The Town will endeavor to update the Zoning Bylaws to account for changes in technology. (Selectboard, Planning Commission and Zoning Administrator)

Health and Emergency Service Policies:
2. To ensure that development shall occur in a manner that insures the safety of all citizens and visitors.

Health and Emergency Service Recommendations:
1. To maximize, within the extent of the law, the extent to which all roads are constructed and maintained in such a manner so that all emergency services can be performed. (Selectboard, Road Commissioner, Road Foreman and Windham County Sheriff)

Fire Prevention Policy:
1. To support the fire departments and rescue services which directly serve Westminster residents and businesses.

Fire Prevention Recommendations:
1. The Town will adopt policies to ensure that all development is designed in a manner consistent with the best fire safety practices. (Zoning Administrator, Planning Commission and Development Review Board)
3. The Town will support actions that ensure that firefighting infrastructures (substations, equipment, dry hydrants, and main fire station) be maintained and improved as necessary. (Prudential Committee and Westminster Volunteer Fire Department)

Water Supply Policies:
1. To maximize water conservation practices when planning for development.
2. To prohibit activities and land uses which may degrade the watersheds of public and private water supply systems.
3. To support the investigation of additional water supplies within the town.
4. To further study and protect the Connecticut River, Saxtons River and East Putney Brook aquifer systems.

Water Supply Recommendations:
1. The Town Health Officer shall encourage people to upgrade water using equipment so as to promote conservation. (Health Officer)
2. The Town shall seek funding and technical assistance to better define aquifer resources and protection mechanisms, such as, maximum impervious surfaces permitted in recharged areas. (Planning Commission)
3. The Town will ask the State to help protect and monitor wellhead areas and prime agricultural lands along US Route 5, US Route 123 and Interstate 91 by minimizing the application of road salt. (Selectboard and Planning Commission)
4. The Town will explore the feasibility of municipal water and sewer services. (Planning Commission)

Transportation Policies:
1. To ensure that the transportation system in Westminster maximizes public safety and provides convenience commensurate with need, while respecting the integrity of the natural environment and maintaining the community's scenic, rural character and historic sites.

Transportation Recommendations:
1. The Town will schedule necessary road and bridge improvements to maintain adequate capacity and establish an equitable and affordable means of paying for these improvements. (Selectboard, Town Manager and Road Foreman)
4. The Town shall continue to install road name signs on all Town roads for the convenience of the public, but especially for use of emergency purposes, i.e. firemen, police, ambulance, and rescue workers. (Selectboard and Road Foreman)
5. The Town will explore the cost-effectiveness of pervious paving materials as a means to reduce the channeling of storm water and icing caused by impervious pavements

Natural Resources Policies:
1. To be proactive in addressing our conservation issues in our planning and permitting processes.

Natural Resources Recommendations:
1. The Town will support the activities of the Conservation Commission. (Selectboard and Town Manager)
2. The Town will support the Conservation Commission in achieving an understanding of state and federal databases pertaining to the natural resources section and ecology of the area, as well as the location of current conserved lands, so that the Conservation Commission may effectively help to guide future development and land preservation. (Selectboard, Planning Commission and Development Review Board)

Groundwater Policies:
1. To protect groundwater resources throughout the Town from contamination by using best available technology.
3. To limit land uses within wellhead protection areas to those uses which pose no threat of contamination to public water supplies.

Groundwater Recommendations:
1. The Town shall support the implementation of statewide Good Agricultural Practices (GAP). (Zoning Administrator, Planning Commission and Development Review Board)
2. The Town shall encourage water testing for contamination in wells located near farms. (Selectboard and Health Officer)
3. The Town will ask the State to help protect and monitor wellhead areas and prime agricultural lands along US Route 5, US Route 123 and Interstate 91 by minimizing the application of road salt. (Selectboard and Planning Commission)
4. The Town shall use calibrated salt dispersal to maintain safe and not overly salted roads. (Road Commissioner and Road Foreman)

Surface Water/Waterways Policies:
3. To protect shore lands along the Connecticut River including following state and federal guidelines for managing flood prone lands.
5. To avoid development and other encroachments – including fill, dredging, new structures, parking areas, infrastructure and utilities, and unnecessary public investments, within mapped fluvial erosion hazard areas.
6. Development in Westminster shall be in conformance with the Flood Hazard Areas Overlay District Map

Surface Water/Waterways Recommendations:
1. The Town shall encourage the use of natural and planted riparian buffers along the rivers and streams to reduce the risk of flood damage and the possibility of pollution. (Planning Commission and Development Review Board)
2. The Town shall require that developers seeking an industrial or commercial permit bordering on a river or stream will meet State requirements regarding potential hazardous waste with the risk of pollutants entering a surface water resource. (Development Review Board)
3. The Town shall adopt policies that mitigate the adverse impacts of run-off into surface waters, and at a minimum will prohibit impervious cover within a designated distance of a river or stream. (Planning Commission)
4. The Town shall conduct stream geomorphic assessments and prepare fluvial erosion hazard area maps and river corridor management plans for all major rivers, streams, and tributaries. (Windham Regional Commission)
5. The Town shall pursue improved river corridor protection by adding fluvial erosion hazard areas to the areas protected by the flood hazard overlay. (Planning Commission)

6. The Town shall refer farmers and citizens to the Windham Natural Resources Conservation District or the water quality division of the VT ANR for needed assistance with meeting Acceptable Agricultural Practices. (Zoning Administrator and Planning Commission)

Forest Lands Policies:
1. To enhance and protect our forest resources.

Earth and Mineral Resources Policies:
3. To reserve Flood Plain lands for agricultural use, recreational use, nature preserves, and other open space uses that do not compromise flood water assimilating capacity.

Earth and Mineral Resources Recommendations:
2. The Town shall adopt Zoning by-laws that will minimize earth disturbances on slopes for which such disturbances will result in erosion and other environmental problems. (Planning Commission, Development Review Board and Zoning Administrator)
5. The Town shall only allow uses of Flood Plain lands which do not restrict or divert the flow of flood waters or endanger the health, safety, and welfare of the public during flooding. (Planning Commission, Zoning Administrator and Development Review Board)

Flood Resilience Policies:
1. It is the policy of the Town to foster the protection and restoration of river corridors, floodplains, wetlands, and upland forested areas that attenuate and moderate flooding and fluvial erosion.
2. It is the policy of the Town to protect floodplains, river corridors, lands adjacent to streams, wetlands, and upland forests through adoption and administration of flood hazard area regulations governing development in designated Special Flood Hazard Areas and River Corridors, in order to reduce the risk of flood damage to infrastructure, improved property, people, and the environment.
3. New development in identified flood hazard, fluvial erosion, and river corridor protection areas should be avoided. If new development is to be built in such areas, it should not exacerbate flooding and fluvial erosion.
4. The protection and restoration of floodplains and upland forested areas that attenuate and moderate flooding and fluvial erosion should be encouraged.
5. Flood emergency preparedness and response planning are encouraged.

Flood Resilience Recommendations:
1. The Town will be familiar with Flood Insurance Rate Maps (FIRMs) that delineate areas that could be covered on inundated by water during flooding. (Selectboard, Development Review Board, Zoning Administrator)
2. The Town will be familiar with up-to-date ANR river corridor maps that delineate the land area adjacent to streams and rivers that are required to accommodate a stable channel. (Selectboard, Development Review Board, Zoning Administrator)
3. The Town will pursue a flood resilience management approach whose essential components are to identify and map flood hazard areas, fluvial erosion hazard areas, and river corridor protection areas based on stream geomorphic assessment studies and maps provided by the Vermont ANR Rivers Program, and designate those areas for protection to reduce the risk of flood damage to infrastructure and private property.
4. The Town will update the Flood Hazard Areas Overlay District to include regulation of river corridors, and include provisions for advance notification of and specific limits on new development activities in identified flood hazard areas, fluvial erosion areas, and/or River Corridors, based on regulatory templates developed by the ANR DEC Rivers Program.
5. The Town will regulate any new development in identified flood hazard areas, fluvial erosion hazard areas, and/or River Corridor to ensure that development does not exacerbate flooding and fluvial

erosion, and extend these provisions to development activities that might increase the amount and/or rate of runoff and soil erosion from upland areas.

Mitigation Progress since the 2015 Plan

The following table lists all of the mitigation actions in the 2015 Hazard Mitigation Plan, and the updated status on each.

	Hazard	Mitigation Action	Responsible Party	Timeframe	Funding Source	Project Priority	Current Status
1	Flood	36 Town Garage Road, buy out property	Town	Pending HMGP approval	HMGP	High	Completed 2016
2	Flood	Culvert upsized on Morse Brook Road	Highway Department	0-12 months	Town Highway Budget	High	Completed 2017
3	Flood	Back flow valve for approximately 6 culverts in the commercial zone on Route 5 near Allen Brothers & Truck Stop	ANR & Vtrans	Unknown	Vtrans	State Road, Vtrans authority	State is not approving back flow values on culverts in this area of the commercial zone
4	Flood	Move or elevate buildings from commercial area on Route 5 that are in the floodplain	VT Emergency Management, WRC & Selectboard	Unknown	HMGP grants	Low	Ongoing -New Construction required to be above floodplain. For existing buildings, upgrades must go through floodplain protocol
5	Flood	Upsize culvert on South Valley Road	Highway Department	12-24 months	HMGP or Vtrans	Medium	Completed
6	Flood	Upsize culverts on 40 miles of Class 3 roads all over town	Highway Department	12-60 months	Vtrans, HMGP or Town Highway Budget	Medium	On-Going
7	Winter Storm/Ice	Education in Schools			Town Budget	High	Completed - Direct link between school and Town. A good system is in place
8	Winter Storm/ Ice	Install back-up power supply for critical facilities	Selectboard	0-12 months	Town Budget	High	Completed

	Hazard	Mitigation Action	Responsible Party	Timeframe	Funding Source	Project Priority	Current Status
9	High Wind	Community Education about where to find safe shelter and how to prepare for incoming high winds	EMD	Annually	Town Budget	Medium	Ongoing - efforts were made through Westminster Cares to create list of residents who are most vulnerable.
10	High Wind	Education to new homeowners and construction firms regarding construction practices to offset negative effects of high wind	Selectboard	12-24 months	Town Budget	Low	On-Going - New construction has to follow state construction codes.
11	Landslide	Riparian plantings along major stretches of the Conneticut River	ANR/Selectboard/ Highway Department/ Conservation Commission	12-60 months	ANR Ecosystem Restoration Grants	Medium	On-Going - Saxtons River had plantings in 2019, CT River still needs buffer plantings
12	Flood	Private Pond – needs armored and emergency overflow sluice	Selectboard / Property Owner/ ANR	0-12 Months	Grants	High	It was unclear which pond this was related to.

Development of Mitigation Actions and Projects

The Westminster hazard mitigation stakeholder group identified the following new hazard mitigation activities based on an evaluation of hazard event vulnerability not addressed by existing hazard mitigation initiatives and the feasibility of new activities.

In the Mitigation Action Table, mitigation actions are listed in priority order by hazard. Actions were prioritized by the plan participants. These are new actions so any shifts in prioritization of actions came out through the multi-year plan development process. The following criteria were used in establishing project priorities. The ranking of these criteria is largely based on the best available information and best judgement as many projects are not fully scoped at this time.

Prioritization was done during the meetings for the plan development in discussion among participants and guided by WRC.

Cost-Benefit Analysis

As part of public involvement discussions, there was a rough cost/benefit analysis done for each action listed in the table and those results are shown in the table. The below cost and benefits tables address the priorities for the mitigation strategies that are stated in the Mitigation Actions Table. This was how the mitigation actions were assessed by the Hazard Mitigation Planning participants. Priority was assessed somewhat independently of cost/benefit and was based more on the perceived need of each action and availability of funding, verses what the action costs.

At the time of applying for FEMA's PDM-C or HMGP grant programs, each projected listed in the Mitigations Actions Table will undergo full benefit-cost analysis (BCA) methodology, version 5/1 or higher to maximize savings. Whenever possible, Westminster will utilize 406 mitigation funding.

Cost Estimates

High	= > $100,000
Medium	= $25,000 - $100,000
Low	< $25,000

Benefit Estimates

High	Public Safety
Medium	Infrastructure/Functionality
Low	Aesthetics/General Maintenance

Mitigation Action Table

Hazard Addressed	Issue Detail	Action	Lead Party	Partnerships	Timeframe for Completion	Potential Funding Source	Mitigation (M) or Preparedness (P)	Project Priority
Flooding	Further education is need for businesses located in floodplains on how to mitigate for potential flooding	Communicate with Business on how to take mitigation actions in preparation for flooding and other natural disasters	EMD	Incident Commander	2022	Town Budget, Volunteer Time	M	High
Flooding	Concern for major flooding if an upstream dam on the CT river in Rockingham had a failure	Create a systems procedure for the Town (develop evacuation routes, road closures and public mapping)	EMD	Incident Commander, CRJC Wantastiquest Subgroup	2022-2023	Grant	P	High
Flooding	Communication needed to Westminster residents on evacuation routes	Disseminate information on evacuation routes to Westminster residents	EMD Incident Commander	Incident Commander	2023	Town Budget, Volunteer Time	P	High
Fluvial Erosion	Undersized culverts do not allow adequate flow and drainage near roads	Upsize culverts on 40 miles of Class 3 roads all over town	Highway Department		2021-2025 (on-going)	Better Back Roads, Grants in Aid, Town Budget	M	High

Hazard Addressed	Issue Detail	Action	Lead Party	Partnerships	Timeframe for Completion	Potential Funding Source	Mitigation (M) or Preparedness (P)	Project Priority
Fluvial Erosion	Riparian buffers are important in the management of river corridors and reduce the impacts of high water flowing through streams	The Town shall encourage the use of natural and planted riparian buffers along the rivers and streams to reduce the risk of flood damage and the possibility of pollution.	Conservation Commission	Windham County Natural Resources Conservation District, Connecticut River Conservancy	2024	WCNRCD & CRC have steam buffer planting programs	P	High
Fluvial Erosion	Rivers are dynamic systems that change over time. Protection of river corridors can prevent loss of structures, prevent fluvial erosion and return rivers to a state of equilibrium	The Town shall pursue improved river corridor protection by adding fluvial erosion hazard areas, or other river corridor protection strategies, to the area protected by the flood hazard overlay.	Planning Commission	WRC	2025	None	M	Medium
Damaging Winds	The Disaster Recover Center needs a backup source of power in case of downed utilities	Get backup power for the Westminster Institute, the identified Disaster Recovery Center	Westminster Institute	Town Manager	2021-2022	ARPA	P	High

Hazard Addressed	Issue Detail	Action	Lead Party	Partnerships	Timeframe for Completion	Potential Funding Source	Mitigation (M) or Preparedness (P)	Project Priority
Damaging Winds	The Town does not have a list of vulnerable residents that would need assistance or check in's during prolonged outages.	Ask Westminster Cares, who has done a good job of connecting with vulnerable populations in Westminster, to put a question on their intake form to share contact information with the Town.	EMD	Westminster Cares, Fire Department	2021-2022	None	P	High
Damaging Winds	During prolonged outages, vulnerable residents might need assistance and have no way to communicate their need.	Develop a system of communication with Fire Dept to reach out to community during prolonged outages.	EMD	Fire Department, Westminster Cares	2021-2023	Town Budget	P	High
Damaging Winds	Community Education is needed about where to find safe shelter and how to prepare for incoming high winds	Provide education to residents so they know how to prepare for storms and where to find resources and shelter during prolonged outages. Provide articles in the Westminster Gazette and a link on Town Website to www.ready.gov	EMD		2021-2022	Town Budget	P	Medium

Hazard Addressed	Issue Detail	Action	Lead Party	Partnerships	Timeframe for Completion	Potential Funding Source	Mitigation (M) or Preparedness (P)	Project Priority
Drought	When wells and springs run dry, residents do not know where they can access potable water.	Initiate a community discussion and connect with neighboring communities on where residents could get potable water in case of dry wells and extended outages.	Selectboard	Fire Department, Aqueduct Society, Fire District 5	2023	None	M	Medium
Invasive Species	Further education is needed for Town employees on current invasive plants and insects	Organize a training for Town employees of current invasive issues	Conservation Commission	Road Foreman, Highway Department	2021-2025 (on-going)	Free Programs offered through VT Urban & Community Forestry Program	M	Medium
Invasive Species	Early detection of invasive species is important for future management	Provide information to town residents on the First Detector Trainings offered through the State and encourage several residents to become First Detectors.	Conservation Commission	Windmill Hill Pinnacle Association, Department of Forest Parks and Recreation	2021-2022	Volunteer Time	M	Medium

Hazard Addressed	Issue Detail	Action	Lead Party	Partnerships	Timeframe for Completion	Potential Funding Source	Mitigation (M) or Preparedness (P)	Project Priority
General Goals	Communications up and down the chain of command, within Town departments and between the Town, State and Federal Government, with regards to Town business and emergency planning, is weak.	Town Officials and Department Heads would research systems and put together a proposal to take before the Selectboard for establishing a system of communication.	Town Manager	Town Department Heads	2022-2024	Town Budget	M	High
General Goals	The Town of Westminster has poorly documented land use records as well as a lack of easy access to those records.	Identify a system, including a back-up system, to serve the purpose to document and maintain land use records that also provide easy but secure accessibility to those records.	Town Clerk	Consultant	2021-2023	Grants and Town Budget / Restoration Fund	P	Medium

Implementation of Mitigation Actions / Capabilities

Each town has both barriers and capabilities that will affect how they are able to carry out mitigation actions.

Barriers to Implementation:

1. Up through the beginning of 2022, Westminster had a very active Town Manager who, in addition to administrative responsibilities, had sole responsibility over many critical functions in Town, such as Emergency Management Director (EMD), Zoning Administrator, Health Officer, Animal Control Officer, and Road Commissioner. With the departure of the Town Manager, there are large gaps in knowledge regarding Town business. The Town has realized that it needs to have more people involved and aware of different critical functions in Town. The Town has started to distribute responsibilities and should continue to do so into the future.
2. With the recent departure of the EMD, new members of Town Government should receive training in Emergency Management.
3. With the recent departure of the Road Commissioner (who was also the Town Manager), Westminster should designate a new Road Commissioner to work closely with the Road Foreman and crew on prioritizing projects throughout town.
4. Some Boards and Committees have trouble finding replacements or new members while others are thriving and often have contested races.
5. Transportation projects can get drawn out for 2-3 years between getting an engineering study, getting engineering design work completed, and getting funded.

Capabilities to build upon for implementation:

1. 5 road crew staff
2. 7 Town Hall staff other than road crew
3. The Town has a 5-year capital plan, with some of its future goals to include upgrading the Northwest Community House and replacing underground fuel tanks at the Town Garage.
4. For communications, the Town has a website and has started a Facebook page. There is also active engagement in the Westminster Front Porch Forum site. The Town has a monthly newspaper called the Westminster Gazette.
5. There is an Active Conservation Commission
6. The Windmill Hill Pinnacle Association owns a lot of acreage along the Pinnacle ridgeline. They are activity managing for invasive species on their properties.
7. There is a well-functioning Fire Department and Rescue Squad (with 47 members in 2021). They have a good number of volunteers on both squads compared to many other small towns that struggle to get volunteers. They are drawing in younger members through a Junior Members program. The fire and rescue squads could use a few more volunteers who live in the western side of town and volunteers who can respond to daytime calls.
8. The Selectboard has lots of local knowledge.
9. The Windham Regional Commission provides assistance when needed.
10. There is a Floodplain Overlay District in place. Town could update floodplain ordinance to include River Corridors and/or more restrictive standards.
11. The Town is currently working with Vermont DEC and Watershed Consulting on developing a Stormwater Master Plan.
12. With the assistance of Windham Regional Commission, Westminster updates its Emergency Management Plan annually.
13. Westminster has an engaged citizenry and has an active Town Meeting.

1. There has been a full culvert assessment in Town and the Town has been updating the state map as upgrades are made. With the transition of the Town Manager position, WRC can assist the Town in updating the inventory each year at the Town's request.

Recognizing that there is no place that doesn't have barriers to overcome in project implementation, Westminster should focus on engaging around emergency management at the town level. There are a limited number of committed volunteers and staff who make this town function well. They are heavily invested and plan to remain in the area. The Town can have a hard time recruiting new volunteers. Westminster residents are primarily located along smaller roads that can be difficult to access during certain times of the year. This lends to a "do it yourself" mentality that serves Westminster positively.

The town looks to and works closely with the Windham Regional Commission. They look to the Regional Plan policies for guidance on land use decisions which influence their town plan policies and goals. The town works closely with VT Department of Environmental Conservation Agency of Natural Resources and the Army Corps of Engineers when mitigating any work in streams or rivers. Additionally, the town adopts the latest VTrans Road Standards for road/culvert/bridge improvement projects. With the support of these agencies and the Commission, Westminster is capable of carrying out all of the mitigation actions outlined in this plan.

Incorporating into Existing Planning Mechanisms

The following policies, programs and activities related to hazard mitigation are currently in place and/or being implemented in the town of Westminster.

- The Town Plan directs visions and goals that include Natural Resources and Land-Use.
- The Town has completed an Emergency Management Plan and updates that regularly.
- Road Standards are followed by the town.
- A culvert and bridge inventory has been completed and was mapped by the WRC. These inventories are updated as needed.
- The Town is compliant with the NFIP.

The Committee analyzed these programs and plans for their effectiveness and noted improvements as needed.

The Town of Westminster feels that the Hazard Mitigation Plan is one of several plans that informs and influences reasonable land use decisions, Westminster is aware and current on integration of hazard mitigation elements into most existing plans and relevant Town documents.

Where gaps have been identified, such as in a list of vulnerable people to be contacted in emergencies by the Town, someone has already been identified and is working to fill that gap. The mitigation planning process is continual and as new issues arise Westminster is committed to incorporating new information into Town documents as deemed necessary.

Type of Existing Protection	Description	Effectiveness/Enforcement/Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
Town Plan	Plan for coordinated town-wide planning for land use, municipal facilities, etc.	Flood resiliency and fluvial erosion is being addressed in the Town Plan Update.	Town Plan was updated last in 2015 and does address flood resilience. A new mitigation action is to look at River Corridors.
Local Emergency Management Plan	Municipal procedures for emergency response	All hazards response plan for EOC purpose	Updated and adopted annually. Last updated in 2022.
School Emergency Response Planning	There are four schools in Westminster: Westminster Schools (Central and West locations), Bellows Falls Union High School, Kurn Hattin Homes, and The Compass School	The fire chief and EMD and the schools have various plans and exercises depending on school. Fire Chief and EMD works with each school with what they want to do for emergency planning.	The EMD will work with Windham Northeast Supervisory Union for their schools and will expand that plan to the private schools. Schools maintain and update their own Emergency Response Plans per state regulations. The Town's LEMP states this.
Mutual Aid – Emergency Services	Agreement for regional coordinated emergency services	Keene (NH) Mutual Aid – written agreement/contract for Fire/Ambulance and HazMat, 911 services	None identified
Road Standards	Design and construction standards for roads and drainage systems	Adopted the latest 2019 Vtrans Town Road and Bridge standards	None identified
Subdivision Regulations	Regulates the division of land, standards for site access and utilities	Zoning and Subdivision Bylaws adopted June 12, 2017	None identified
Sewage Regulations	The Town does not have a municipal sewer system.	The state regulates on-lot sewage systems.	None identified
Flood Hazard Area and River Corridor Regulations	Regulates development in FEMA flood hazard areas and ANR River Corridors	There is a Flood Hazard Overlay District in the Zoning ByLaws, updated in 2017.	Zoning and Subdivision Bylaws should address River Corridors.
Site Plan Review (SPR)	Site development standards for conditional use development	Town Zoning Regulations	None Identified
Maintenance Programs	Bridge & Culvert Inventory	A full inventory was completed in 2001 and a partial updated in 2019.	The Town will work with WRC to continue to update the inventory as culverts and bridges are replaced.

Type of Existing Protection	Description	Effectiveness/Enforcement/Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
Building Code	Regulates building construction standards	State building codes for commercial and apartment buildings. Inspections are only done for fire safety.	Town doesn't have its own code.
Zoning Regulations	Regulates development	Zoning and Subdivision Bylaws adopted June 12, 2017	None identified

PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan – Yearly Review

In the Spring of each year, the Town will dedicate a specific stakeholder meeting time to review and update the Plan as necessary. The reviewers will be the emergency stakeholder group that includes: a member of the Selectboard, Planning Commission, Road Foreman, Fire Department and EMD. The person who will lead this stakeholder group will be the EMD. A member of the stakeholder group will present the updates at a Selectboard meeting, making sure that members of the public are notified of the annual update and meeting times so that they can provide comments.

Plan Maintenance – 5 Year Update and Evaluation Process

The Hazard Mitigation Plan is dynamic. To ensure that the plan remains current and relevant, 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 every five years. This update will include a thorough evaluation of the plan and incorporate any new requirements that FEMA has for Hazard Mitigation Plans.

The next major update will occur five years after this plan is adopted and approved by FEMA (in 2027). The 2027 plan update will follow a similar process as described in the Planning Process Section of this plan and begin with adequate time to ensure there is not a lapse of time between approved plans being in place. The stakeholder group and members of the public, will review each portion of the Plan to assess whether new data and/or circumstances warrant updates to those sections. The review will give particular attention to the risk assessment section, identifying critical structures, mitigation goals, progress made to implement the proposed mitigation actions and progress made to the Plan's risk assessment and analysis into other town planning and regulatory programs.

Post-Disaster Review/Update Procedure

After any FEMA disaster declaration or funding received from FEMA, there will be a review of the plan by the emergency planner at the Windham Regional Commission along with the Town's emergency planning team to update the plan. The team will record any hazard related events or determine if the town is interested in applying for grant funding. All plan review meetings will be publicized and open to the public.The Plan and any proposed revisions will be on the jurisdiction's website with information on how the public can direct questions/comments to the Planning Team.

Continued Public Participation

Maintenance of this plan and implementation of the mitigation strategies will require the continued participation of local citizens, agencies, and other organizations. To keep the public aware of and involved in the local hazard mitigation efforts, the town will take the following measures:

- Provide hazard mitigation information at Town Meeting
- Publicly warn and invite member of the public to the Selectboard meeting to hear updates on the hazard mitigation plan and provide comments
- Post the hazard mitigation plan on the website
- During the next major update to the Hazard Mitigation Plan, expand the outreach to the general public by notifying the public of meetings through the Town Bulletin board, town website, fire department, Westminster Gazette, Facebook, Front Porch Forum, etc.

APPENDICES

A. Adoption resolution

B. Email and Letter from Westminster Town Manager and Village Trustee Chair regarding the status between the Village and Town (from 2015 Plan)

C. Flyer for the Plan Development Public Meetings

D. Town of Westminster website screenshot announcing public meeting for development of the LHMP

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

F. Email sent to town officials and plan participants for comment on the draft plan (PENDING)

G. Email sent to adjacent towns for comment on the draft plan (PENDING)

H. Flyer posted at various location around Westminster asking for comment on the draft plan (PENDING)

I. Email to Town Manager about Publicizing Public Survey.

J. Public Survey question and responses related to hazards in the community.

Certificate of Adoption
Town of Westminster, VT
Selectboard

A Resolution Adopting the 2022 update of the *Local Hazard Mitigation Plan for the Town of Westminster, VT*

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

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

WHEREAS, the Town of Westminster, VT 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 Westminster, VT 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 Westminster, VT will follow the Plan Maintenance Process outlined in this plan to assure that the plan stays up to date and compliant; and

NOW, THEREFORE BE IT RESOLVED that the Town of Westminster, VT adopts the updated *Town of Westminster Local Hazard Mitigation Plan* as well as future revisions and maintenance required by 44 CFR 201.6 and FEMA for a period of five (5) years from the date of this resolution.

Duly adopted this _____ day of _____.
date *month, year*

Selectboard

_____
Jason Perry, Chair

_____
Kevin Hughes, Vice Chair

_____
Aileen Chute

ATTEST

_____
Alison Bigwood, Interim Town Manager

Appendix B: Letter from Village Trustee Chair, Jim Matteau – letter received 1/30/15

Village of
Westminster, VT

Incorporated 1912 **05158**

Alyssa Sabetto
Windham Regional Commission
139 Main Street, Suite 505
Brattleboro, VT 05301

Dear Alyssa,

This letter is written is in followup to our discussions and also to a discussion between me and Westminster Town Manager Russ Hodgkins, regarding the Village of Westminster and its relationship to the Town of Westminster regarding emergency planning. I understand that among FEMA requirements for mitigation plan approval is active participation by all affected jurisdictions, and so I offer the following information:

I. The Village was incorporated in 1912 and held various functions over the 100+ years since, but in recent times has performed no municipal functions. The Village owns no buildings or property and has no paid staff. Its governance structure is all volunteer and consists of five trustees—of which I currently am chair—and a treasurer and clerk. The Village no longer collects any taxes or provides any direct services.

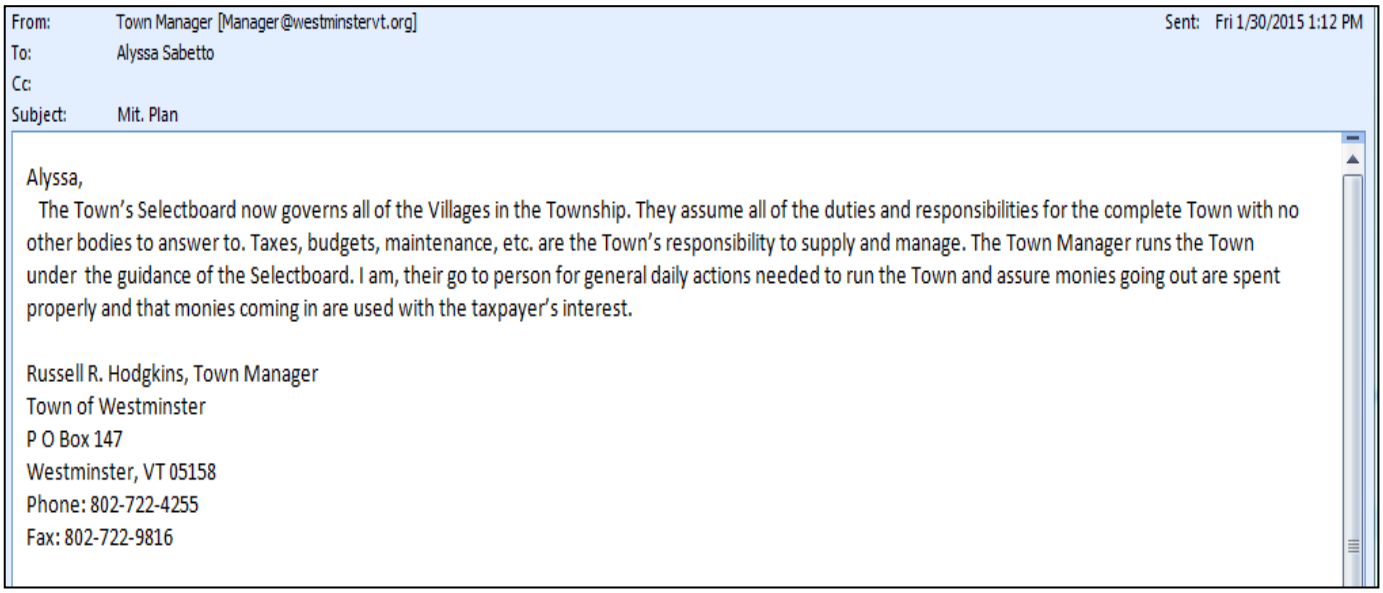
II. All municipal functions within the village boundaries are, in fact, town functions. There is no official village role in maintaining facilities of any kind, nor has there been such a role for several years. As part of this, all emergency response, planning, recovery and mitigation actions are done by the Town of Westminster and the Westminster Fire District #3.

III. In view of the the Village government being a vestige of its former self, the Trustees regularly meet only annually. At the next meeting, to be held on the first Tuesday in April, consideration of dissolving the Village government is expected to be on the agenda. Vermont statute specifies a process for such action—called a merger of the Town and Village—in Title 24 Chapter 49. If that goes forward I would anticipate seeking WRC assistance. But it is important to note that this has been discussed and rejected by Village Trustees in the past, and that could again be the result. In that case I see no change in the status quo and all emergency response, planning, recovery and mitigation actions would continue to be carried out by the Town of Westminster and the Westminster Fire District #3.

Thank you, and please let me know if you have any questions or need any other information.

James P. Matteau
Chair

Appendix B Continued: Letter from Town Manager, Russ Hodgkins



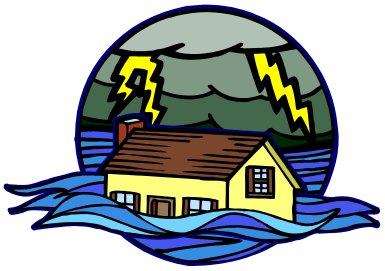
From: Town Manager [Manager@westminstervt.org] Sent: Fri 1/30/2015 1:12 PM
To: Alyssa Sabetto
Cc:
Subject: Mit. Plan

Alyssa,
The Town's Selectboard now governs all of the Villages in the Township. They assume all of the duties and responsibilities for the complete Town with no other bodies to answer to. Taxes, budgets, maintenance, etc. are the Town's responsibility to supply and manage. The Town Manager runs the Town under the guidance of the Selectboard. I am, their go to person for general daily actions needed to run the Town and assure monies going out are spent properly and that monies coming in are used with the taxpayer's interest.

Russell R. Hodgkins, Town Manager
Town of Westminster
P O Box 147
Westminster, VT 05158
Phone: 802-722-4255
Fax: 802-722-9816

Appendix C: Flyer for the Plan Development Public Meetings

Update of the Westminster Local Hazard Mitigation Plan Public Meeting Announcement



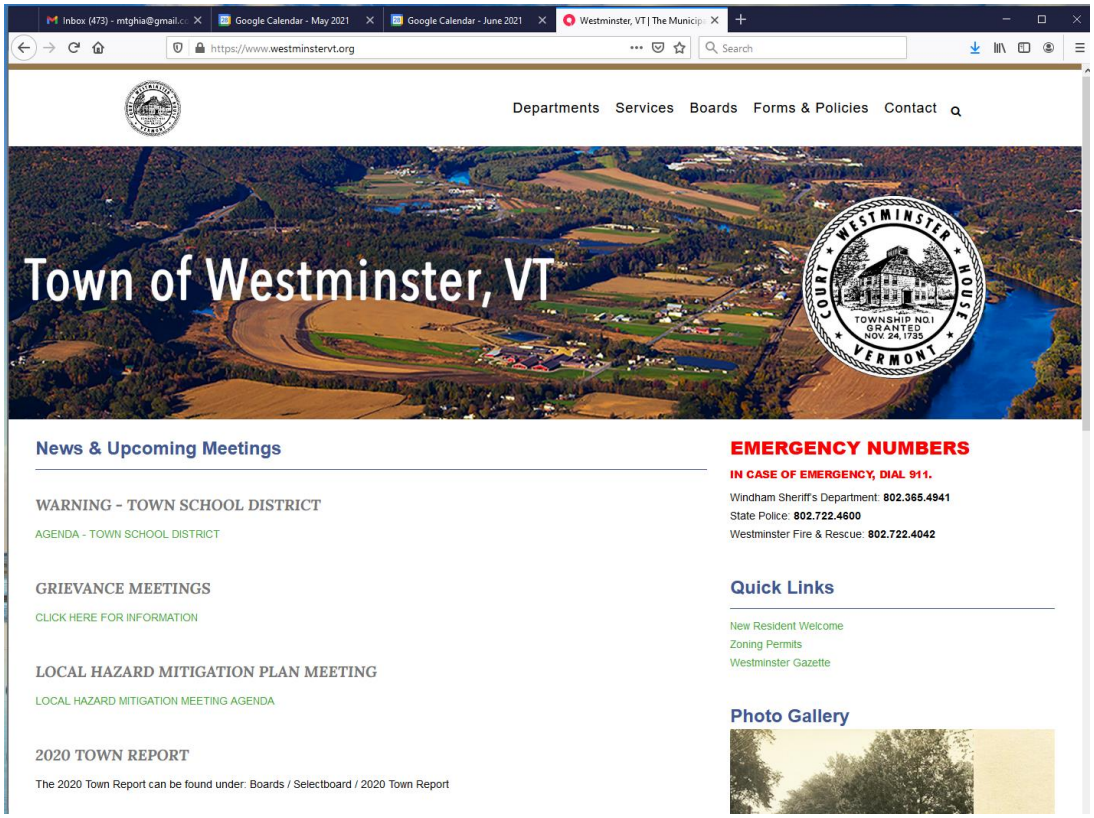
2 Meeting Dates: May 24 and June 7, 2021
Time: 5:00 -6:30 PM
Via Zoom
See Westminster Town website for meeting details

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

For more information, contact:
Margo Ghia at 802-257-4547 x116 or
mghia@windhamregional.org

WINDHAM REGIONAL COMMISSION

Appendix D: Town of Westminster website screenshot announcing public meeting for development of the LHMP



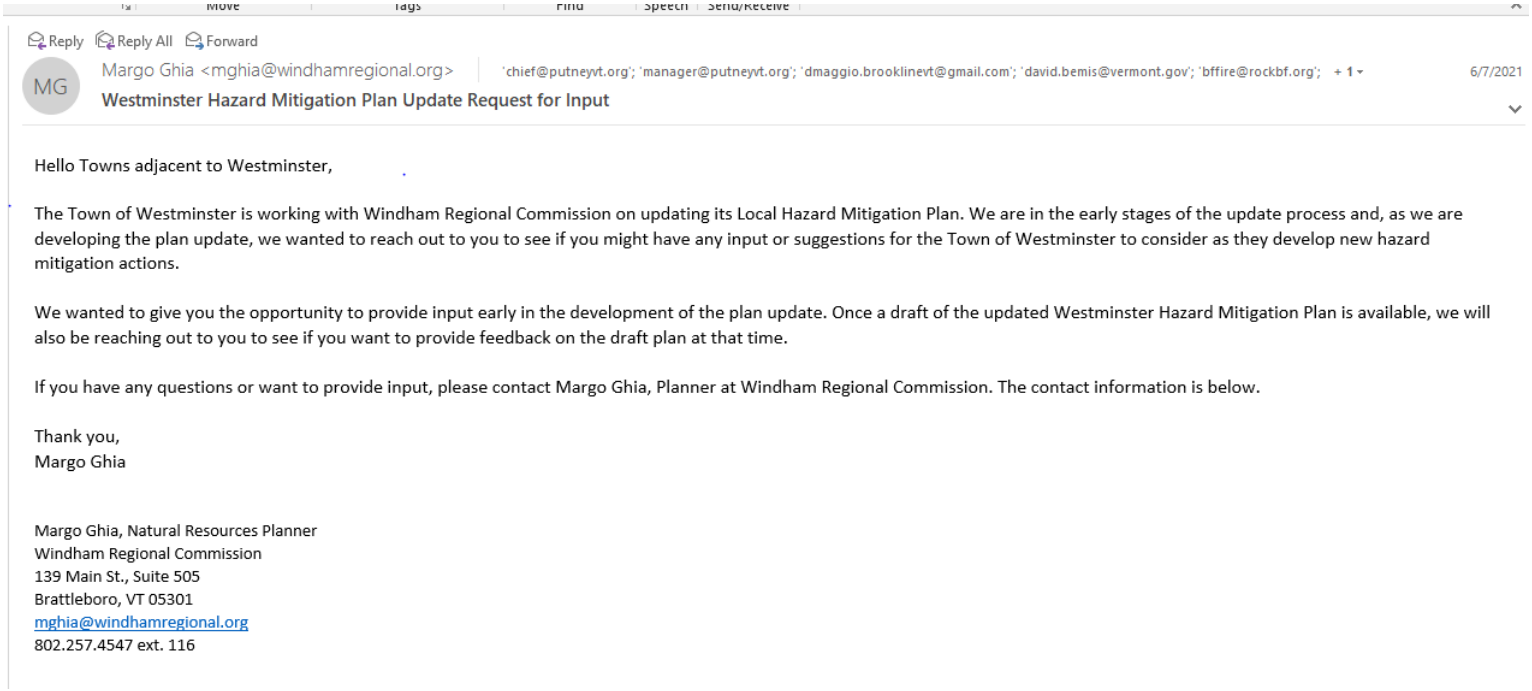
Appendix E: Email sent on 6/7/2021 to adjacent towns for comment on the draft plan

Neighboring Towns to Westminster:

- Putney
- Brookline
- Athens
- Rockingham

EMD/Town Manager (if the Town has one) contact information:

- chief@putneyvt.org, manager@putneyvt.org,
- dmaggio.brooklinevt@gmail.com,
- david.bemis@vermont.gov,
- bffire@rockbf.org, manager@rockbf.org



Move Tags Find Speech Send/Receive

Reply Reply All Forward

MG

Margo Ghia <mghia@windhamregional.org> 'chief@putneyvt.org'; 'manager@putneyvt.org'; 'dmaggio.brooklinevt@gmail.com'; 'david.bemis@vermont.gov'; 'bffire@rockbf.org'; + 1 6/7/2021

Westminster Hazard Mitigation Plan Update Request for Input

Hello Towns adjacent to Westminster,

The Town of Westminster is working with Windham Regional Commission on updating its Local Hazard Mitigation Plan. We are in the early stages of the update process and, as we are developing the plan update, we wanted to reach out to you to see if you might have any input or suggestions for the Town of Westminster to consider as they develop new hazard mitigation actions.

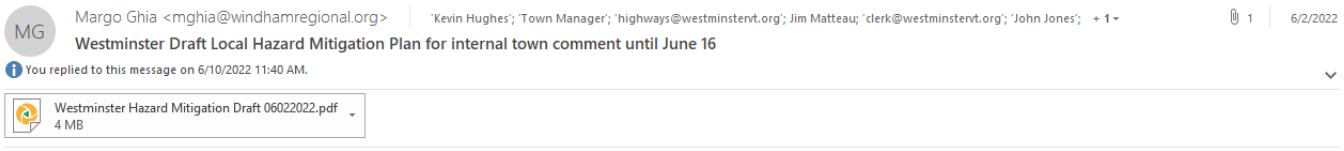
We wanted to give you the opportunity to provide input early in the development of the plan update. Once a draft of the updated Westminster Hazard Mitigation Plan is available, we will also be reaching out to you to see if you want to provide feedback on the draft plan at that time.

If you have any questions or want to provide input, please contact Margo Ghia, Planner at Windham Regional Commission. The contact information is below.

Thank you,
Margo Ghia

Margo Ghia, Natural Resources Planner
Windham Regional Commission
139 Main St., Suite 505
Brattleboro, VT 05301
mghia@windhamregional.org
802.257.4547 ext. 116

Appendix F: Email sent to town officials and plan participants for comment on the draft plan



MG

Margo Ghia <mghia@windhamregional.org> 'Kevin Hughes'; 'Town Manager'; 'highways@westminstervt.org'; Jim Matteau; 'clerk@westminstervt.org'; 'John Jones'; + 1 1 6/2/2022

Westminster Draft Local Hazard Mitigation Plan for internal town comment until June 16

You replied to this message on 6/10/2022 11:40 AM.

Westminster Hazard Mitigation Draft 06022022.pdf
4 MB

Hello Westminster Selectboard, Interim Town Manager, and Stakeholders who participated in the Public Meetings for the Local Hazard Mitigation Plan,

Attached is the first draft of the Westminster Local Hazard Mitigation Plan. **This draft is just being passed around at this point for internal town review and is not yet out for public comment. Please review the attached draft and provide comment back to me by June 16th.** I'll incorporate comments and then put the plan out for public comment. If you don't get the chance to comment during this internal opportunity, you can comment during the public opportunity. You can mark up the attached document and scan it back to me, call me with comments or email me back a list of comments. I'm not able to send in a word version, as the file is too large for email.

Please note that there are a few dates in the plan development section of the plan are *not yet completed* because we are still in the process of internal and public review. These dates will be updated as the process moves forward. There are also a few of the appendices that say PENDING, but will be in the final plan.

Alison, Chuck, and Kevin - If there are any town staff or plan development participants who are not getting this email that should, please forward it on to them.

Kevin – Can you please forward this email to the rest of the Selectboard Members?

Alison – There are people who were on the development team that I don't have emails for, would you be able to forward this email to these individuals?
Kelly Thayer (Town Office)
Cole Streeter (Westminster Fire Department Chief)
Nancy Dalzell (Westminster Village Trustee, Commisioner of the Cambell Fund)

Thank you,
Margo

Margo Ghia, Natural Resources Planner
Windham Regional Commission
139 Main St., Suite 505
Brattleboro, VT 05301
mghia@windhamregional.org
802.257.4547 ext. 116

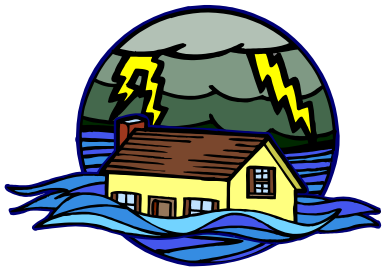
Appendix G: Email sent to adjacent towns for comment on the draft plan (PENDING)

Appendix H: Flyer posted at various location around Westminster asking for comment on the draft plan

Westminster Hazard Mitigation Plan

PUBLIC COMMENT PERIOD

The draft Westminster Hazard Mitigation Plan is now available for public review on the town website: www.westminstervt.org. A hard copy is available at the Town Office Monday-Friday from 8:30am - 4:00pm.

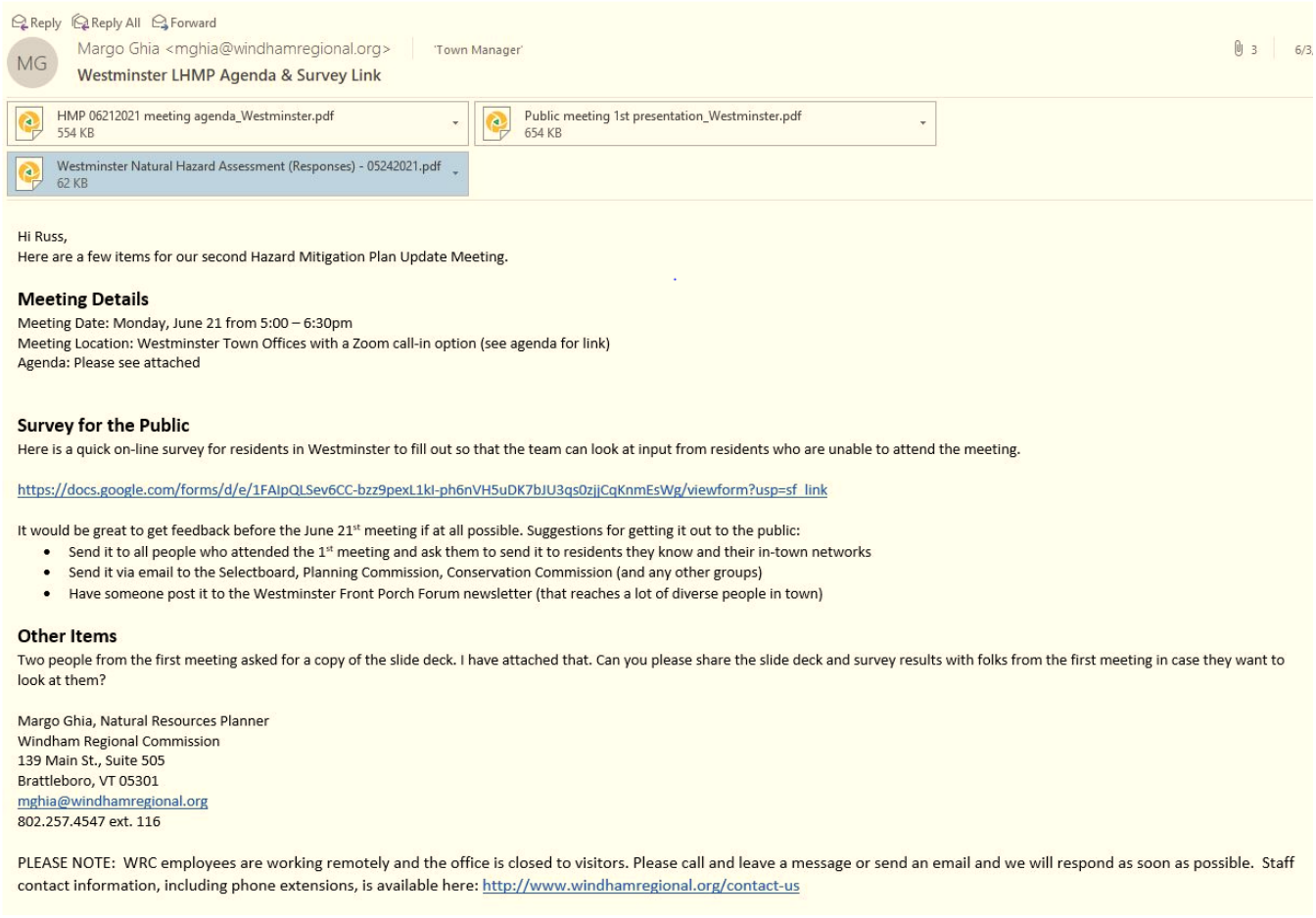


The Plan will be available for comment until July 1, 2022.

Anyone who would like to comment on the plan should contact Margo Ghia at the Windham Regional Commission. She can be reached via phone at 802-257-4547 x116 or email at mghia@windhamregional.org.

We encourage your review and participation!

Appendix I: Email to Town Manager about Publicizing Public Survey.



Reply Reply All Forward

MG

Margo Ghia <mghia@windhamregional.org> 'Town Manager' 3 6/3

Westminster LHMP Agenda & Survey Link

HMP 06212021 meeting agenda_Westminster.pdf 554 KB

Public meeting 1st presentation_Westminster.pdf 654 KB

Westminster Natural Hazard Assessment (Responses) - 05242021.pdf 62 KB

Hi Russ,
Here are a few items for our second Hazard Mitigation Plan Update Meeting.

Meeting Details

Meeting Date: Monday, June 21 from 5:00 – 6:30pm
Meeting Location: Westminster Town Offices with a Zoom call-in option (see agenda for link)
Agenda: Please see attached

Survey for the Public

Here is a quick on-line survey for residents in Westminster to fill out so that the team can look at input from residents who are unable to attend the meeting.

https://docs.google.com/forms/d/e/1FAIpQLSev6CC-bzz9pexL1kl-ph6nVH5uDK7bJU3qs0zjjCqKnmEsWg/viewform?usp=sf_link

It would be great to get feedback before the June 21st meeting if at all possible. Suggestions for getting it out to the public:

- Send it to all people who attended the 1st meeting and ask them to send it to residents they know and their in-town networks
- Send it via email to the Selectboard, Planning Commission, Conservation Commission (and any other groups)
- Have someone post it to the Westminster Front Porch Forum newsletter (that reaches a lot of diverse people in town)

Other Items

Two people from the first meeting asked for a copy of the slide deck. I have attached that. Can you please share the slide deck and survey results with folks from the first meeting in case they want to look at them?

Margo Ghia, Natural Resources Planner
Windham Regional Commission
139 Main St., Suite 505
Brattleboro, VT 05301
mghia@windhamregional.org
802.257.4547 ext. 116

PLEASE NOTE: WRC employees are working remotely and the office is closed to visitors. Please call and leave a message or send an email and we will respond as soon as possible. Staff contact information, including phone extensions, is available here: http://www.windhamregional.org/contact-us

Appendix J: Public Survey question and responses related to hazards in the community. (Starts on next page,)

Westminster Local Hazard Mitigation Plan Update Survey

The Town of Westminster and the Windham Regional Commission (WRC) are working together to update the Local Hazard Mitigation Plan and would like your input. This short survey will allow the working group to find out what you think the biggest natural hazards are to the town. Your answers will help the working group identify, analyze and develop mitigation strategies to potential hazards and to lessen the impacts of these hazards in the future.

* Required

1. 1. How long have you lived in or owned a business or property in Westminster? *

Mark only one oval.

- ◯ Less than a year
- ◯ One to five years
- ◯ More than five years

2. 2. What is your age?

Mark only one oval.

- ◯ Under 18
- ◯ 18-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51-60
- ◯ 61-70
- ◯ 71 and older

3. 3. If you live in Westminster, do you own or rent the home you live in?

Mark only one oval.

- ◯ Rent
- ◯ Own
- ◯ Not applicable

4. 4. Is your home or business property located in a designated floodplain? *

Mark only one oval.

- ◯ Yes (Skip to Question #7)
- ◯ No (Go to Question #5)
- ◯ I don't know (Skip to Question #7)

5. 5. (Skip if you answered no to #4) If yes, do you have flood insurance?

Mark only one oval.

- ◯ Yes (Skip to Question #7)
- ◯ No (Go to Question #6)
- ◯ I don't know (Skip to Question #7)

6. 6. (Skip if you answered yes to #5) If no, what is the primary reason you do not have flood insurance?

Mark only one oval.

- ◯ Too expensive
- ◯ I do not know how to purchase flood insurance
- ◯ I have tried to purchase it, but was unsuccessful
- ◯ Other: _____

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

Check all that apply.

- [ ] Drought
- [ ] Extreme temperatures: cold or hot
- [ ] Flood
- [ ] Fluvial Erosion
- [ ] High Wind
- [ ] Geologic Hazards (landslide, sinkhole)
- [ ] Severe Weather – Summer (thunderstorm, hail, lightning)
- [ ] Severe Weather – Winter (ice storm, snow storm, blizzard)
- [ ] Wildfire / Brushfire
- [ ] Dam Failure
- [ ] Invasive Species (Emerald Ash Borer, Wooly Adelgid, etc.)
- [ ] Other: _____

8. 8. Which of the following man-made hazards have you or someone you know experienced while living or doing business in Westminster? (select all that apply)

Check all that apply.

- [ ] Hazardous materials incident
- [ ] Structural fire
- [ ] School safety incident
- [ ] Other: _____

9. 9. What are the top three hazards that you feel will impact you in the next five years? *

_____

_____

_____

_____

_____

10. 10. What actions have you taken to reduce risk for your house / apartment / property / business for potential disasters? (Select all that apply) *

Check all that apply.

- [ ] Purchased homeowners / renters insurance policies
- [ ] Purchased Flood Insurance
- [ ] Floodproofing (elevated furnace, water heaters, electric panels)
- [ ] Installed retrofits such as high impact windows or doors, fire resistant siding, roofing or winter screens, storm shelters, etc.
- [ ] Removed dead / dying trees or vegetation
- [ ] Obtained and placed fire extinguisher(s) in an easily accessible location
- [ ] Alternative power, heat and/or water supply
- [ ] None of the above
- [ ] Other: _____

11. 11. If you have not taken action to reduce risk, what are the barriers?

Mark only one oval.

- ◯ Cost
- ◯ Don't know what actions are best to take
- ◯ Don't have the skills or know who to bring in to help install or impliment action
- ◯ Other: _____

12. 12. What cost effective measures should the Town take to lessen damage from disasters (natural and man-made)? (select all that apply)

Check all that apply.

- [ ] Culvert and road upgrades
- [ ] Remove structures in areas known to have frequent flooding
- [ ] Improve natural stormwater management
- [ ] Protect vegetation adjacent to surface waters (rivers, streams, ponds, etc.)
- [ ] Other: _____

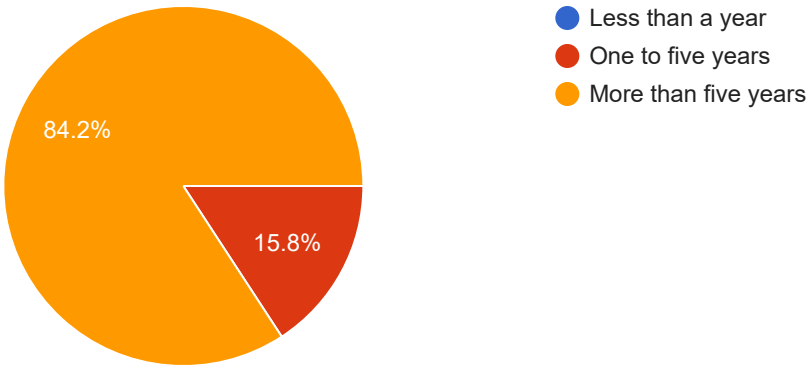
Westminster Local Hazard Mitigation Plan Update Survey

19 responses

Publish analytics

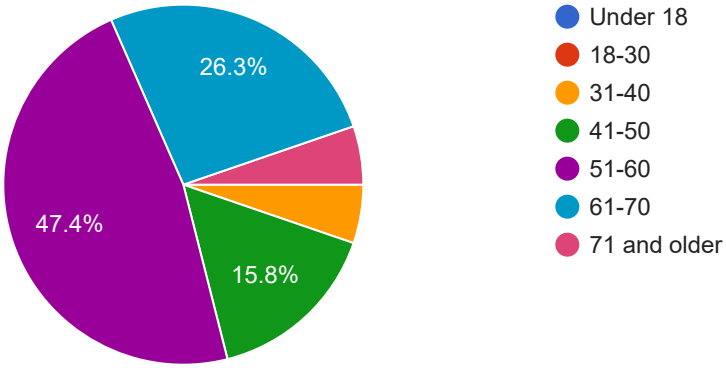
1. How long have you lived in or owned a business or property in Westminster?

19 responses



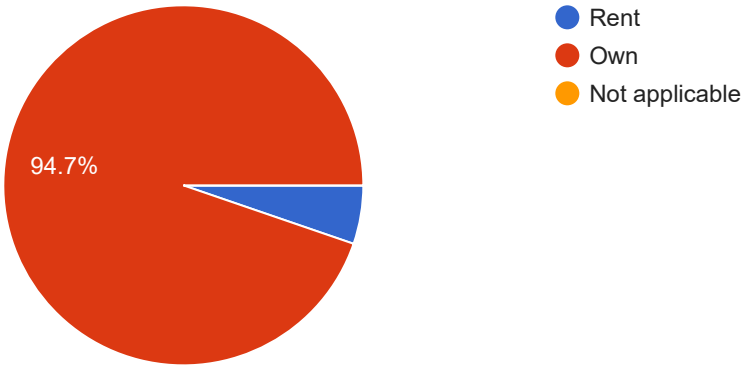
2. What is your age?

19 responses



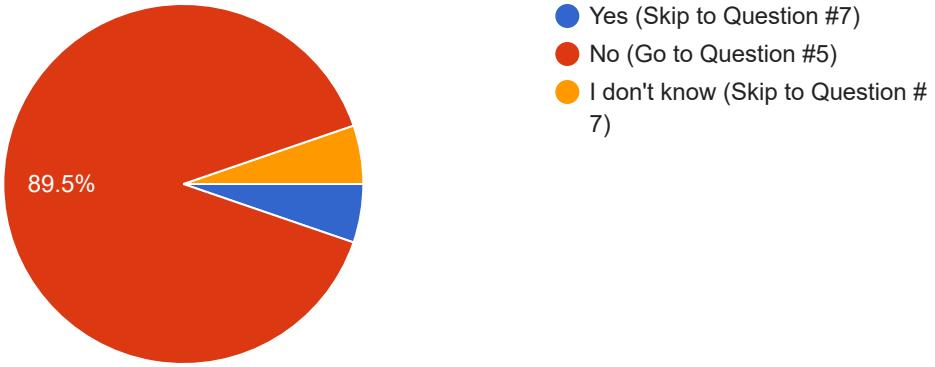
3. If you live in Westminster, do you own or rent the home you live in?

19 responses



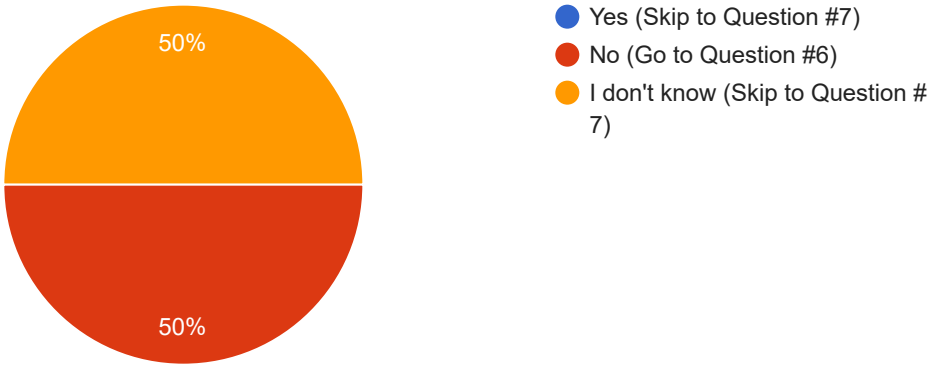
4. Is your home or business property located in a designated floodplain?

19 responses



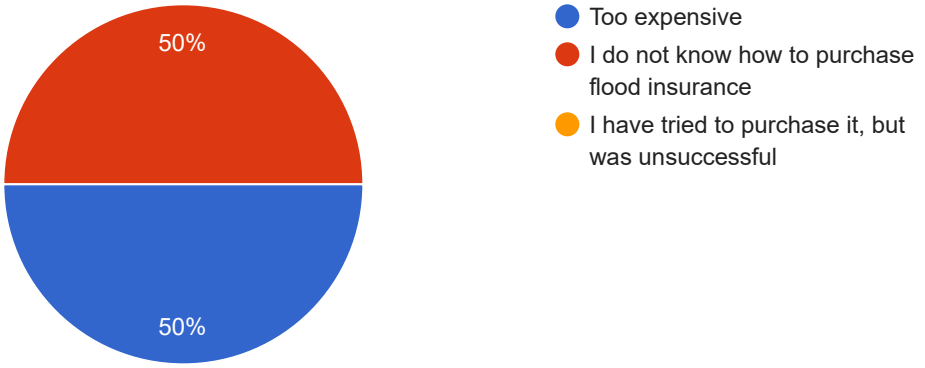
5. (Skip if you answered no to #4) If yes, do you have flood insurance?

2 responses



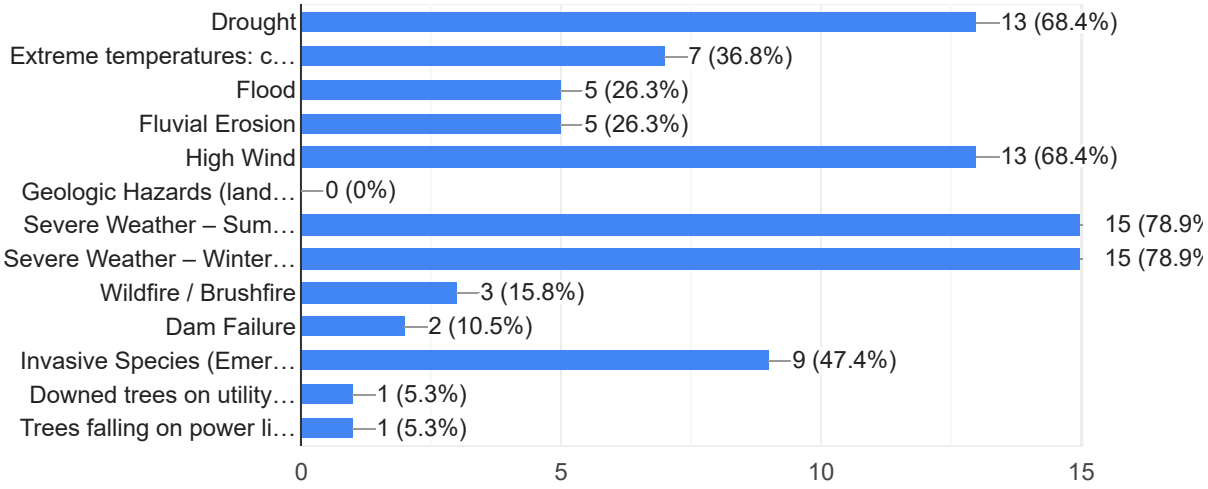
6. (Skip if you answered yes to #5) If no, what is the primary reason you do not have flood insurance?

2 responses



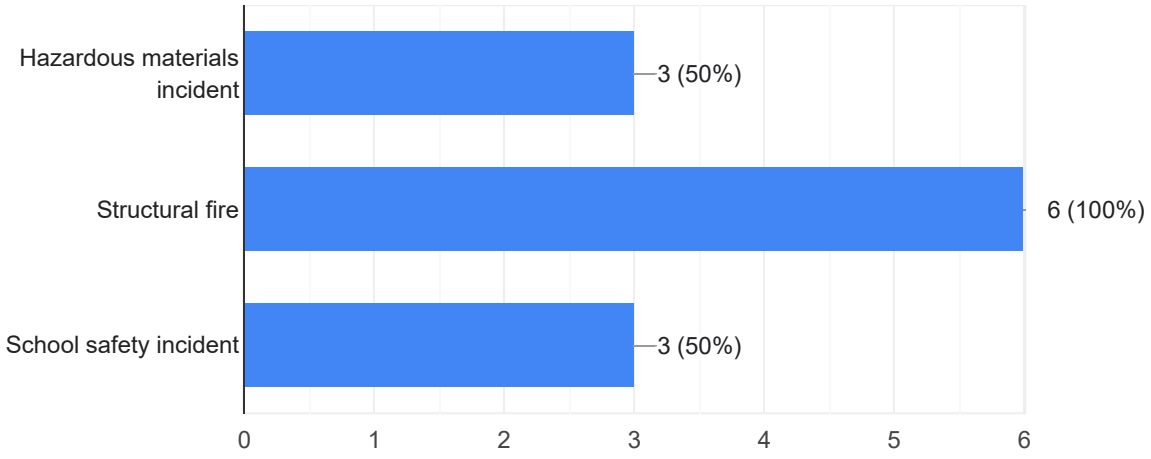
7. Which of the following natural hazards have you or someone you know experienced while living or doing business in Westminster? (select all that apply)

19 responses



8. Which of the following man-made hazards have you or someone you know experienced while living or doing business in Westminster? (select all that apply)

6 responses



9. What are the top three hazards that you feel will impact you in the next five years?

19 responses

Extreme weather, extreme weather conditions, hot or cold, safety events, school, personal, business, community.

Climate change - flood and drought

We lose our electricity frequently and I worry that we'll lose all of our frozen foods sometime, as a result. I also worry about a large tree coming down onto our house, due to inclement weather. And I know it's not a natural hazard, but damn the Westminster West road is sorely in need of repaving!!

Drought, wind

Climate change, storms, fire

Technological, manmade along with natural

Extreme weather (including microbursts), fluvial erosion, drought

Heat.

Flood / Winter Storm / Wind

Extreme weather that results in erosion, flooding

none

Extreme weather,,

Possible Drought , High winds , extreme weather

Weather extremes

Downed trees. Poor roads. Power outage

Drought, severe weather

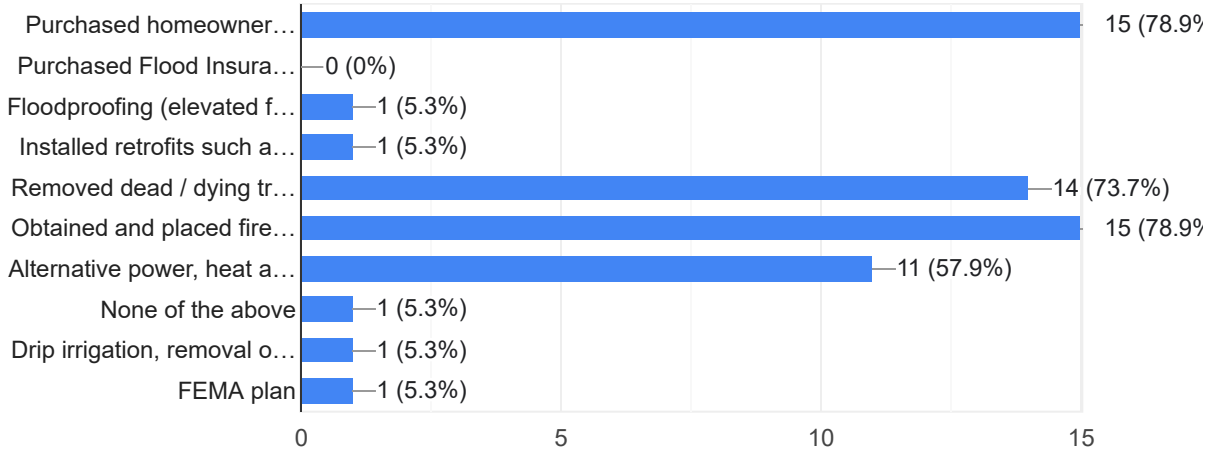
drought, major storm, fire

climate change, climate change, climate change

Global Warming

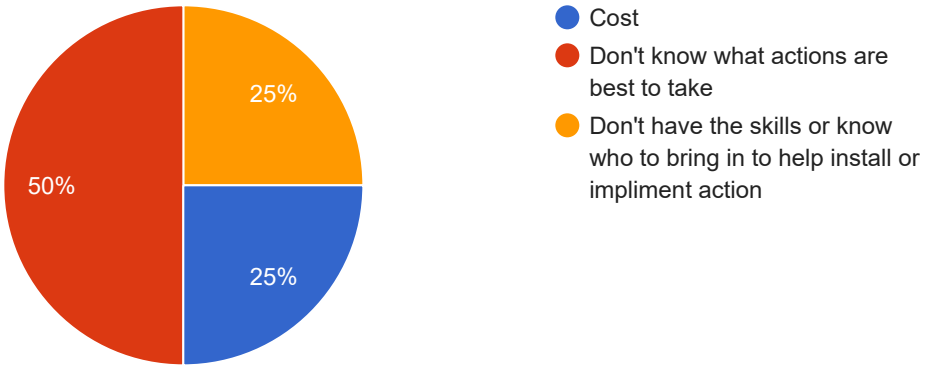
10. What actions have you taken to reduce risk for your house / apartment / property / business for potential disasters? (Select all that apply)

19 responses



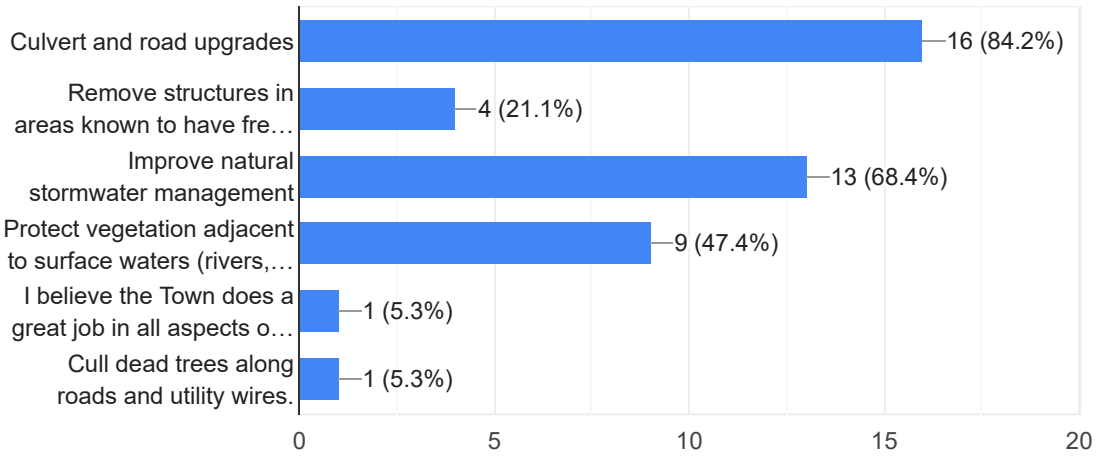
11. If you have not taken action to reduce risk, what are the barriers?

8 responses



12. What cost effective measures should the Town take to lessen damage from disasters (natural and man-made)? (select all that apply)

19 responses



Google