Town of Pittsfield, Vermont

Local Hazard Mitigation Plan

June 2014 Draft

Prepared by the Two Rivers-Ottauquechee Regional Commission and the Town of Pittsfield

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I. Introduction

Natural and human-caused hazards may affect a community at any time. They are not usually avoidable; however, their impact on human life and property can be reduced through community planning. Accordingly, this Plan seeks to provide an all-hazards mitigation strategy that will make the community of Pittsfield more disaster resistant.

"Mitigation" is defined as any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Previous Federal Emergency Management Agency (FEMA), State and Regional Project Impact efforts have demonstrated that it is less expensive to anticipate disasters than to repeatedly ignore a threat until the damage has already been done. While hazards cannot be eliminated entirely, it is possible to identify prospective hazards, anticipate which might be the most severe, and recognize local actions that can be taken ahead-of-time to reduce the damage. These actions, also known as 'hazard mitigation strategies' can (1) avert the hazards through redirecting impacts by means of a structure or land treatment, (2) adapt to the hazard by modifying structures or standards or, (3) avoid the hazard through improved public education, relocation/removal of buildings in the flood zone, or ensuring development is disaster resistant.

II. Purpose of the Plan

The purpose of this Hazard Mitigation Plan is to assist Pittsfield in identifying all hazards facing the town, ranking them, and identifying strategies to reduce risks from known priority hazards.

The Town of Pittsfield seeks to be in accordance with the strategies, goals, and objectives of the State Hazard Mitigation Plan.

The 2014 Pittsfield Local Hazard Mitigation Plan is the first stand-alone mitigation plan drafted for the Town. Previously, the Town had a town-specific 2011 Annex in the Regional Pre-Disaster Mitigation Plan. This new plan has been reorganized and new sections have been added:

- Program eligibility subsequent to plan approval
- Authority for plan development
- Participating jurisdictions
- Funding for plan development
- Brief information about the community

Old assumptions have been challenged throughout and new information has been added to make the plan stronger and more useful for the Pittsfield town officials and residents who will implement the hazard mitigation strategies in the future.

III. Community Profile

The Town of Pittsfield is a triangular shaped community situated in the northeastern corner of Rutland County, comprising an area of 13, 296 acres or 20.77 square miles. It is bounded by four towns; Stockbridge to the east, Chittenden to the west, Rochester to the north, and Killington to the south. The United States Forest Service (USFS) owns 7,698 acres or approximately 59% of the total land area of Pittsfield.

The physical setting of the Town consists of rather steep mountains rising to an elevation in excess of 3,200 feet in the west to more gradual but rugged mountains in the east, interspersed with valleys and streams in the lower elevations. In the valleys, the terrain is relatively level as compared to the rest of the town.

Pittsfield's population in 2010 was 546 compared to 427 in 2000. During this period, growth was about 28%, compared to an overall rate of approximately 0.38% for the Two Rivers-Ottauquechee Region.

According to the U.S. Census, there were 435 housing units in Pittsfield in 2010. In 2000, there were 393 housing units. This amounted to an increase of 42 units or about 10.7% over the ten year period. A housing unit, as defined by the U.S. Census, includes houses, apartments, mobile homes, and rooms for occupancy.

The Town lies within the service area of Green Mountain Power which supplies electrical power to all sections of town.

Pittsfield is served by a volunteer fire and rescue department called Pittsfield Fire and Rescue. The fire house, constructed in 1970, is situated in the village and serves as headquarters for the department. The structure has three open door bays and houses the fire engines. The Town belongs to the Rutland County Mutual Aid Organization. They also work cooperatively with the Stockbridge Fire Department.

The department provides services free to the Town's people and is financed by the Town of Pittsfield through its town budget, community fund raising activities, and donations.

For a town of Pittsfield's size, the department is very well organized and equipped. It presently enjoys the reputation of providing a high level of service to the community.

Security for the Town is provided by two constables elected each year at Town Meeting. The constable may call the Vermont State Police, with barracks in Rutland, if the need arises. Additional services are provided by the Rutland County Sheriff's department through a contract arrangement with the Town.

With the increased mobility of our population, it is recommended that the law enforcement system within the Town be periodically reviewed by the citizens to see if a more sophisticated approach is necessary to maintain a reasonable level of law and order.

Medical emergencies are handled by the private, non-profit White River Valley Ambulance, Inc. located in Bethel. They have three ambulances that are fairly new. Pittsfield's volunteer First Response Squad works in conjunction with White River Valley Ambulance providing emergency care until the ambulance

arrives. Pittsfield has a first response vehicle housed at the Fire House used for transporting fast squad members and their equipment to emergency calls. The vehicle is not used for patient transportation. Pittsfield's Fast Squad also works cooperatively with the Stockbridge Fast Squad. The closest hospitals are Gifford Medical Center, located in Randolph, and the Rutland Regional Medical Center. Medivac services are available by the DHART helicopter.

IV. The Planning Process

A. Plan Developers

Samantha Holcomb and Ellie Ray, both Land Use Planners at the Two Rivers-Ottauquechee Regional Commission (TRORC), assisted the Town of Pittsfield with updating its Hazard Mitigation Plan.

The core planning team was comprised of the following individuals:

This section of the Plan satisfies 44 CFR 201.6(b)(1) and 201.6(c)(1) (or, A3.a and A3.b of FEMA's Local Mitigation Plan Review Guide, 2011).

Name	Role/Organization	How Participation Was Solicited
George Deblon	Road Foreman	On 02/7/2013, TRORC staff sent an introductory letter and e-mail to Selectboard members (Mark Begin, George Deblon, Jerry Drugonis). In this letter, TRORC's staff requested names and contact information for potential committee members to revise Pittsfield's HMP. Pittsfield's representatives responded with a list of individuals they wanted to participate. TRORC staff proposed a meeting date and time, and an initial introductory meeting was scheduled. TRORC staff continued to meet with the update committee until the Hazard Mitigation Plan was adopted by the Selectboard.
Donald Flynn	Town Lister, E911 Coordinator	
Jennifer Howard	Planning Commission	
Suana Bicek	Planning Commission, Chair	
Sarah Gray	Planning Commission	
Patty Haskins	Town Clerk	

Additional Participants in the Process:

- Jerry Drugonis, Selectboard
- Peter Borden, Former Emergency Management Coordinator

B. Plan Development Process

The 2011 Pittsfield Annex was originally part of the 2008 multijurisdictional Regional Hazard Mitigation Plan, drafted by Two Rivers-Ottauquechee Regional Commission, and approved by FEMA on September 30, 2008. The Pittsfield Annex received FEMA approval on September 30, 2008. This plan has been reconstructed as a single jurisdiction, stand-alone Pittsfield Local Hazard Mitigation Plan that will be submitted for individual approval to FEMA. As such, several sections have been added or updated to include all necessary information.

This section of the Plan satisfies the Element A: Planning Process requirements set out in 44 CFR 201.6.

The changes to this plan include:

- **General**
  - New sections: Plan Development Process, 2011 Mitigation Strategies Status Update chart, Existing Hazard Mitigation Programs, Projects & Activities, Plan Maintenance;
  - Data updates: New hazard incidents, emergency declarations, census data;
  - Hazards have been reevaluated with the hazard ranking system used by the Vermont Division of Emergency Management and Homeland Security.
- **Hazards Analysis**
  - *High Wind* and *Ice Jams* have all been added to the list of "top hazards";
  - Severe Weather events are now depicted in a chart that shows the multiple hazards involved during each event;
  - Hazardous Material Spill has been removed from the list of "top threats";
  - For each hazard, a location/vulnerability/extent/impact/likelihood table has been added to summarize the hazard description.
- **Maps**
  - Added a map of the Town of Pittsfield depicting critical facilities, town infrastructure, and the NFIP designated floodway and 100 year floodplain.

The following represent the avenues taken to draft the Pittsfield Hazard Mitigation Plan:

- **Activities**
  - 2/7/13: Introductory letter and email indicating that the Town's HMP would soon expire and explaining the process for revising and readopting the HMP. Requested names and contact information for potential committee members to revise HMP. Sent to Selectboard members (Mark Begin, George Deblon, Jerry Drugonis).
  - 5/22/13: Met with Selectboard member George Deblon and Lister Donald Flynn and introduced the Hazard Mitigation Plan update process. Reviewed the Mitigation Actions identified in 2011 and determined the current status.
  - 8/15/13: Met with Selectboard member George Deblon and Planning Commission member Jennifer Howard to discuss existing hazard mitigation programs, projects and activities. Then the group began discussing and ranking the hazards the Town of Pittsfield was most vulnerable to. After the hazards were ranked, a discussion ensued of

the hazards the committee would like to focus on, and the final "top threats" were chosen.
    - 2/24/2014: Met with committee to discuss first draft. The entire draft was reviewed in detail, with TRORC staff making note of any comments or errors.
    - 05/20/2014: Met with the committee to develop a list of hazard mitigation actions to address the Town's top five hazards.
- **Public participation and involvement** (*44 CFR 201.6(b)(1)*)
    - 2/7/13: Introductory letter and email indicating that the Town's HMP would soon expire and explaining the process for revising and readopting the HMP. Requested names and contact information for potential committee members to revise HMP. Sent to Selectboard members (Mark Begin, George Deblon, Jerry Drugonis).
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    -
    - _____: A notice was posted in_____ from _____ to _____to alert community members that a forum would be hosted to discuss the Hazard Mitigation Plan update. A community wide event/meeting was held to introduce the planning process and the work that had been accomplished by the Pittsfield Disaster Response Committee. Comments were recorded and then incorporated into the final draft.
    - ____: A notice was posted in_____ from _____ to _____to alert community members that a public hearing with the Pittsfield Selectboard would be taking place. A public hearing to adopt the final draft was held.
- **Governmental participation and involvement** *(44 CFR 201.6(b)(2)*)
    - Sent revised draft to Selectboard Chair—sent 6/10/2014
    - Sent digital copy of the revised draft to the Green Mountain National Forest—6/10/2014
    - Sent revised draft to Vermont Emergency Management—sent _____
- **Neighboring community participation and involvement** *(44 CFR 201.6(b)(2)*)

- 10/2013: A notice was placed in the Two Rivers-Ottauquechee Regional Planning Commission Newsletter alerting recipients that Granville was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan.
- Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place.
  - Valley News—ran 03/20/2014
  - The Herald of Randolph—ran 03/20/2014
  - Journal Opinion—ran 03/20/2014
  - Vermont Standard—ran 03/20/2014
- Sent revised draft to neighboring Selectboards for comment—sent 6/10/2014
  - Towns of: Stockbridge, Killington, Chittenden, and Rochester.

- **Review of existing plans, studies, reports, and technical information** (*44 CFR 201.6(b)(3)*)
  - Pittsfield Hazard Mitigation Plan (Adopted 3/10/2011)
    - This Plan was referenced extensively during the plan development process, especially in regard to the worst threats and mitigation action strategies identified in 2011.
  - Pittsfield Town Plan (Adopted 9/28/2010)
    - This Plan provided TRORC's staff with background information on the community, as well as more detail on their emergency services.

This section of the Plan satisfies 44 CFR 201.6(b)(3) (or, A4.a and A4.b of FEMA's Local Mitigation Plan Review Guide, 2011).

C. Status Update on Mitigation Actions Identified in 2011

The following table outlines the mitigation actions that were proposed in Pittsfield's 2011 All-Hazard Pre-Disaster Mitigation Plan for the Town of Pittsfield (adopted on March 10, 2011 as an appendix to the Two Rivers-Ottauquechee Regional Commission's multi-jurisdictional Pre-Disaster Mitigation Plan). Participants in the plan update process reviewed those actions and reported on the status of each:

This section of the Plan satisfies the requirements of 44 CFR 201.6(d)(3).

2009 Mitigation Action	**2014 – Status of Mitigation Actions**
ALL HAZARDS 1. Ensure that the Basic Emergency Operations Plan (BEOP) is current.	In process. Pittsfield updates their Local Emergency Operations Plan (LEOP), formerly the Basic Emergency Operation Plan (BEOP) every year. It was last revised and adopted on July 9, 2013. Please note that Pittsfield is currently revising their LEOP for the 2014 year.
2. Use the Pre-Disaster Mitigation (PDM) plan for Hazard Identification and Mapping.	In process.
FLASH FLOOD 3. Continue the planned road maintenance program and update existing culvert inventory. Upgrade culverts and ditching.	In process. The latest culvert inventory was completed in-house in fall of 2013. These culverts include upgrades on the following roads: Upper Michigan Road.
4. Review Flood Hazard Area	☑ Complete. Pittsfield last updated and adopted flood hazard area

Regulations.	regulations on February 4, 2014.
HAZMAT 5. Pursue HAZMAT training for Fire Department.	In process.
6. Investigate ways to minimize risk from CV bulk oil storage tanks.	In process. No issues identified to date.
WINTER STORM 7. Encourage utilities to continue regular tree trimming along power lines.	In Process. Route 100 has just been completed, and the focus is now on back roads. Utilities missed the last cycle, and it has been 12 years since the last cutting. Back roads tree trimming was completed in the summer of 2013 by Asplundh.
FIRE 8. Obtain training and equipment appropriate that will allow the fire department to fight wildfires safely.	☑ Complete. Town created a Community Wildfire Protection Plan with the assistance of TRORC staff in 2013.
9. Develop additional dry hydrant sites in rural locations.	In process. A new wet hydrant was installed on Hawk Mountain this year, as well as a new dry hydrant at Amee Farm. Town maintains a list of priority sites for additional hydrants.
10. Develop cooperative agreement with US Forest Service on fire fighting.	☑ Pittsfield completed a Community Wildfire Protection Plan in May 2013 (as per action number 8 above). Verbal, but no written, agreements have been formed with the USFS.

D. Existing Hazard Mitigation Programs, Projects & Activities

The Town of Pittsfield is currently engaged in the following hazard mitigation programs, projects and activities:

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3).

Community Preparedness Activities

- As of 2014, Pittsfield's Local Emergency Operations Plan (LEOP), formerly the Basic Emergency Operations Plan (BEOP)
  - BEOP adopted July 9, 2013
  - LEOP for 2014 currently being updated/worked on

Insurance Programs

- Participation in National Flood Insurance Program (NFIP)
  - Pittsfield's initial Flood Hazard Boundary Map was identified on Dec. 13, 1974 and their initial Flood Insurance Rate Map (FIRM) was dated Sept. 4, 1991. The Town's FIRM has been updated, and the current effective map date is Aug. 28, 2008.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3)(ii).

Land Use Planning

- Pittsfield Town Plan (Adopted on Sept. 28, 2010)
- Flood Hazard Area Regulations (Adopted Feb. 4, 2014)

Hazard Control & Protection of Critical Infrastructure & Facilities

- Recent culvert inventory completed, Fall 2013
- Home buy-outs of four properties along Route 100 in the village. Two additional properties are in process (one on Route 100 and another on Park Place).

Education/Public Outreach

- Community Recovery Partnership Meeting
    - Organized by the State of Vermont and partnering organizations for the following towns—Rochester, Pittsfield, Stockbridge, Granville and Hancock—in the aftermath of Tropical Storm Irene (Aug. 2011). Meeting held on Jan. 30, 2012 in Rochester, VT.

E. Plan Maintenance

This Plan (the Pittsfield Local Hazard Mitigation Plan) will be updated and evaluated annually at a May Selectboard meeting, along with the review of their Basic Emergency Operations Plan (BEOP). This meeting will constitute an opportunity for the public and other town officials to hear about the town's progress in implementing mitigation strategies and to give input on future activities and Plan revisions.

This section of the Plan satisfies 44 CFR and 201.6(c)(4)(i), 201.6(c)(4)(ii), and 201.6(c)(4)(iii).

Updates and evaluation of this Plan by the Selectboard and the local Emergency Coordinator/Director will also occur within three months after every federal disaster declaration for the Pittsfield area. The Town shall reference the Local Hazard Mitigation Plan when working on Town Plan amendments or changes to the Town's bylaws.

The Two Rivers-Ottauquechee Regional Commission (TRORC) will help with Plan updates if assistance is requested by the Town of Pittsfield and if funding is available. If TRORC is unable to assist the Town, then Pittsfield's Town Clerk, Administrative Assistant, or Selectboard will update the Plan, or the Selectboard may appoint a committee of interested citizens (including the current local Emergency Coordinator/Director) to draft changes.

The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice within the municipal building, and notice in The Randolph Herald newspaper and the TRORC newsletter and blog, inviting the public to the scheduled Selectboard (or specially scheduled) meeting. Additional stakeholders shall be invited to the meeting; these include: White River Valley Ambulance, Inc. and the Vermont Agency of Natural Resources (VT

ANR). VT ANR will be invited because they can provide assistance with NFIP outreach activities in the community, models for stricter floodplain zoning regulations, delineation of fluvial erosion hazard areas, and other applicable initiatives. These efforts will be coordinated by the Selectboard.

Updates may include changes in community mitigation strategies; new town bylaws, zoning and planning strategies; progress on the implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities. If new actions are identified in the interim period, the plan can be amended without formal re-adoption during regularly scheduled Selectboard meetings.

Pittsfield shall also incorporate mitigation planning into their long-term land use and development planning documents. The 2013 Vermont Legislature passed a law requiring all towns to incorporate flood resiliency elements into their town plans as of July 2014. To do so, flood hazard and fluvial erosion hazards will be identified, and strategies and recommendations will be provided to mitigate risks to public safety, critical infrastructure, historic structures and public investments. This Local Hazard Mitigation Plan will help the town to comply with the new community flood resiliency requirement for town plans adopted after July 2014.

It is recommended that the Town review and incorporate elements of the Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/FEH bylaws. The incorporation of the goals and strategies listed in the Local Hazard Mitigation Plan into the municipal plan, zoning regulations and flood hazard/FEH bylaws will also be considered after declared or local disasters. The Town shall also consider reviewing any future TRORC planning documents for ideas on future mitigation projects and hazard areas.

V. Community Vulnerability by Hazard

A. Hazard Identification

Mitigation efforts must be grounded in the rational evaluation of hazards to the area and the risks these hazards pose. This is done through a process, which in essence asks and answers three basic questions:

- What bad things can happen?
- How likely are they to occur?
- How bad could they be?

This process, which is laid out in the table below, is an attempt to inventory the known hazards, establish the likelihood of them occurring in the future, and then assess the community's potential vulnerability to each. In performing this analysis, we are then able to prioritize actions that are designed to mitigate the effects of each of these disaster types and ultimately make Pittsfield a safer place.

It is important that we learn from the past in order to avoid the same disasters and their outcomes. Disasters that have occurred within the Town of Pittsfield, the larger region, and the State of Vermont can give us good information about what types of disasters we can expect in the future and what kinds of damage they might cause. However, while this historical data can inform our perspective of what might happen in the future, it is by no means a prophecy. While Pittsfield might not have been impacted by a specific hazard in the past, this does not necessarily mean it will never be affected in the future. Indeed, the advance of climate change means that old weather patterns may not hold. For instance, in recent years, Vermonters have seen an increase in the number and severity of storms, especially rainfall events. Armed with historical data and a healthy respect for climate change and the unknown, we have tried our best to identify hazards and prepare for the future.

The following table reflects the hazards that we believe can be expected, or are at least possible, in the central Vermont area. We have considered factors such as frequency of occurrence, warning time and potential community impact to rank each and determine which hazards pose the greatest threats to life and property in Pittsfield.[1] The worst threats (bolded in the table, below) are then followed-up with discussion and mitigation strategies throughout the rest of this Plan.[2] It should be noted that hazards assigned with the same "Hazard Score" are not in order and their placement in the table should not be assumed to reflect their potential to create hazards for the town.

[1] The ranking methodology used in this Plan (see Appendix A) is closely modeled on that which is used by the Vermont Division of Emergency Management & Homeland Security (VDEMHS). The only changes made were intended to reflect the more limited geographical scope of this analysis, which is focused on a small, rural town rather than the entire State of Vermont (which is the focus of VDEMHS).

[2] It's important to note that those hazards which were not found to pose the greatest threats may still occur in Pittsfield's future; however, they are not the focus of this Plan.

Hazard	Frequency of Occurrence	Warning Time	Potential Impact	Hazard Score
Lightning	Highly Likely	None to Minimal	Minor	10
Hail Storm	Highly Likely	None to Minimal	Negligible	9
High Wind	Highly Likely	3-6 hrs.	Minor	**9**
Ice Jams	Highly Likely	3-6 hrs.	Minor	**9**
Structure Fire	Likely	None	Minor	9
Tornado	Occasionally	None to Minimal	Moderate	9
Extreme Cold/Snow/Ice Storm	Highly Likely	6-12 hrs.	Minor to Moderate	**8.5**
Hurricanes/Tropical Storms	Likely	6-12 hrs.	Moderate to Major	8.5
Flash Flood/Flood/Fluvial Erosion	Highly Likely	3-6 hrs.	Negligible	**8**
Earthquake	Likely	None	Negligible	8
Landslides/Mudslides	Occasionally	None to Minimal	Negligible	8
Severe Weather (Thunderstorm, Lightning, High Winds, Hail, and Flooding) ****Note: We have defined 'Severe Weather' to include two or more of the above listed hazards.***	Highly Likely	6-12 hrs.	Minor	**8**
Hazardous Material Spill	Occasionally	None	Negligible	7
Wildfire	Occasionally	None to Minimal	Negligible	7
Invasive Species/Infestation	Highly Likely	12+ hrs.	Negligible	6
Extreme Heat	Likely	12+ hrs.	Negligible	5
Drought	Occasionally	12+ hrs.	Negligible	4
Avalanche (Pittsfield does not have the exposures that would make the Town vulnerable.)	N/A	N/A	N/A	N/A
Dam Failure (There are no dams in the Town of Pittsfield.)	N/A	N/A	N/A	N/A
Tsunami (Vermont is landlocked.)	N/A	N/A	N/A	N/A
Volcano (Vermont has no active volcanoes.)	N/A	N/A	N/A	N/A
Water Supply Contamination (Pittsfield does not have a public water system.)	N/A	N/A	N/A	N/A

After engaging in discussions using their best available knowledge, the Town of Pittsfield identified the following "top hazards" which they believe their community is most vulnerable to:

- High Wind
- Ice Jams
- Extreme Cold/Snow/Ice Storm
- Flash Flood/Flood/Fluvial Erosion
- Severe Weather (Thunderstorm, Lightning, High Winds, Hail, and Flooding)

Each of these "top hazards" will be discussed in the following sections. Within each section, previous occurrences of each hazard will be listed, including the County-wide FEMA Disaster Declarations (DR-#), where applicable. Hazards information was gathered from local sources (ex. town history book), the National Climatic Data Center's (NCDC's) Storm Events Database (1950-2012 and 2006-2012), the Spatial Hazard Events and Losses Database for the United States (SHELDUS) 1960-2012, and Special Reports produced by the National Weather Service in Burlington, Vermont. This section also includes a description of each "top hazard" and a hazard matrix that will also include the following information:

Hazard	**Location**	**Vulnerability**	**Extent**	**Observed/Estimated Impact**	**Likelihood/Probability**
Type of hazard.	General areas in community that may be vulnerable to the hazard.	Community structures affected by hazard.	General details of the most notable event(s).	Dollar value or percentage of damages.	Occasionally: 1–10% probability of occurrence per year, or at least one chance in next 100 years Likely: >10% but <100% probability per year, at least 1 chance in next 10 years Highly Likely: 100% probable in a year

B. Hazard Profiles of "Top Hazards"

1. High Wind

Generally speaking, wind is the result of differences in atmospheric pressure, and moves from an area of high pressure to an area of lower pressure. Slight or moderate winds are unlikely to be dangerous, and often have beneficial effects. However, high winds may pose a threat to lives, property and critical utility infrastructure. Light construction, such as manufactured homes, is often the most damaged by high wind events. High winds typically occur as a result of various weather events, such as severe storms, tropical storms or hurricanes.

To date, there have been no reported and documented tornados in the Town of Pittsfield; however, tornadic events have occurred in Rutland County and surrounding areas. Thus, all that is needed for a tornado to occur in the Town of Pittsfield are the "right" conditions. These events are capable of

damaging or destroying structures, downing trees and power lines and creating injuries and death from collapsing buildings and flying objects. Tornadoes are less common than hail storms and high winds, but have occurred throughout Vermont. In fact, 45 tornadoes were recorded between 1953 and 2012, injuring 78 people and causing over $5 million dollars in estimated property damage. Nearly all of these occurred from May through August, and most of these occurred in the afternoon when thunderstorm activity is highest due to heating of the atmosphere. Tornadoes are classed by wind speeds from 40 – 318 miles per hour (mph) and placed into five categories (F0-F5). All recorded tornadoes in Vermont have either been FO (40-72 mph winds), F1 (73-112 mph winds) or F2 (113-157 mph winds). Interestingly, F2 tornadoes are the most common of the three classes recorded in the state.

One of the strongest and most damaging types of high winds is straight-line winds. Unlike tornadoes, which demonstrate a rotational damage pattern, damage caused by straight-line winds tends to be very linear. This type of wind can be very strong, producing wind speeds as high as 80 to 90 mph, and can last twenty minutes or more. They often occur at the gust front of a thunderstorm or originate with a downburst from a thunderstorm. Straight-line winds are notorious for downing forest stands in linear swaths.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **High Wind**.

Another extremely dangerous weather event that produces high winds is a derecho. Derechos are widespread, long-lived wind storms that are associated with a fast-moving band of severe thunderstorms. They are also capable of producing very high, straight-line winds and even tornadic winds. They are considered a warm-weather phenomenon, as they occur most often in the summer months—in June and July in the Northern Hemisphere. According to a National Weather Service map, the state of Vermont, the northern half of New York State and the rest of New England, derechos have a frequency of occurring about once every four years. There have been a few derechos that have occurred in Vermont in the last 15 years: on July 14-15 of 1995 ("the Adirondacks/Ontario Derecho"), on September 7, 1998 ("the Syracuse Derecho of Labor Day 1998"), on July 4-5 1999 ("the Boundary Waters-Canadian Derecho") and most recently on July 15, 2005 (storm unnamed). It is thought that the worst derecho to hit Vermont was the "Boundary Waters-Canadian Derecho," killing one camper in the Northeast Kingdom.

Despite the threat of straight-line winds and derechos, the most common type of high winds, are strong, sustained winds or wind gusts or gales. These high wind events can still damage critical infrastructure or down trees, which can knock out electricity, block roads and cause bodily harm. As evidenced by the table below, strong sustained winds and/or strong gales are the most common type of high wind in the Town of Pittsfield.

History of Occurrences:

Date	Event	Location	Extent
08/28/2011	Tropical Storm Irene	Pittsfield, Statewide	Winds from TS Irene caused $100k of damage in Rutland Co.

Date	Event	Location	Extent
12/01/2010	High Winds	Rutland County	Winds cause a total of $350k in damage in Rutland Co.
04/16/2007	High Winds	Rutland County	Winds cause a total of $3.5m in damage in Rutland Co.
02/17/2006	High Winds	Rutland County	Winds cause a total of $116,667 in damage in Rutland Co.
09/29/2005	High Winds	Rutland County	High winds cause $150k in damage in Rutland Co.
09/17/1999	High Winds	Rutland County	High winds cause $100k of damage in Rutland Co.
07/19/1996	High Winds	Rutland County	High winds cause $200k in damage in Rutland Co.

The utility company is scheduled to trim around the power lines regularly. This practice helps to reduce the number of customers who lose power and the amount of damage to power lines caused by falling trees and tree limbs.

The Town also clears low hanging branches, dead or dying trees, etc. from their right-of-way.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/ Probability
High Winds	Town-wide	All property and infrastructure.	No town-specific events identified.	Winds from TS Irene caused $100k of damage in Rutland County; damage in Pittsfield from event unknown.	Highly likely

2. Ice Jams

Ice jam events are a serious concern throughout the State of Vermont, owing to the vast number of waterways within the state's footprint. Such events can occur with little to no warning, increasing the impact of such events when they happen.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Ice Jams**.

Ice jams are most prone to occur when heavy rains and rising temperatures cause rapid snow melt. Rivers, as a consequence, swell and ice layers begin to break, which then flow downstream and create obstructions around natural and man-made barriers. The majority of ice jams happen between the months of January and March, and the lead time for an ice jam or flow can range anywhere form a few hours to only one hour. The flows can cause water to rise by multiple feet per hour or even multiple feet within minutes. This can mean that there is insufficient time to prepare for rising water and ice levels.

While flooding from ice jams is not often major, it has the possibility to be catastrophic, particularly in places that have an historic pattern of growth along waterways. Ice jams can have a disastrous impact on waterways and surrounding structures and infrastructure, and they can cause severe erosional issues along with endangering local fish and wildlife populations. There are no known state buildings or facilities in Pittsfield that may be immediately endangered by ice jams; however, basic infrastructure and private property are at high risk.

History of Occurrences:

Date	Event	Location	Extent
04/13/2001	Ice Jam	Rutland Co.	Ice Jams along Otter Creek in Rutland Co.
03/31/1993 – 04/01/1993	Ice Jams	Rutland Co.	Ice jams occurred along the West River, Passumpsic, Black River and Otter Creek in Rutland Co.
02/04/1982*	Ice Jams	Pittsfield, Rutland Co.	West Branch of the Tweed River jammed.

In order to prepare for the possibility of ice jams, Town officials monitor the weather conditions that contribute to ice jams.

Hazard	Location	Vulnerability	Extent	Estimated Impact	Likelihood/Probability
Ice Jams	Along Route 100	All property and infrastructure alongside waterways.	No town-specific events identified.	Dollar value or percentage of damages not known because of a lack of historical data. Minor damage is anticipated.	Highly likely, although specific examples have not been recorded and, therefore, cited herein.

3. Extreme Cold/Snow/Ice Storm

Winter storms are a regular occurrence in Vermont. However, severe winter storms can cause serious damage, including collapse of buildings due to overloading with snow or ice, brutal wind chills, downed trees and power lines and stranded vehicles. People can be at risk of freezing in extended power outages if they lack wood heat or backup power, and individuals shoveling large accumulations of snow can also be at risk from frostbite, hypothermia and heart attacks due to cold and overexertion. While snow removal from the transportation system is standard fare in Vermont winters, extreme snow or ice can close rail and road systems, further jeopardizing any stranded persons that are in danger of freezing or needing medical assistance.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Extreme Cold/Snow/Ice Storm**.

Severe winter storms include a blizzard on February 15-17 in 1958 that dumped over 30 inches and resulted in 26 deaths in New England. On December 26-27 in 1969, another blizzard left 18-36 inches of snow in northwestern Vermont and a whopping 45 inches in Waitsfield. A string of storms in March

2001 hit the state, beginning with 15-30 inches on March 5-6 (later declared a federal disaster), 10-30 inches on the 22nd and 10-20 inches on the 30th. Recent years have seen wet snow storms that have leveled trees and caused widespread power outages.

The worst winter storm in terms of damage to hit the state recently was not a snow storm, but an ice storm. In January of 1998, just the right combination of precipitation and temperature led to more than three inches of ice in spots, closing roads, downing power lines, and snapping thousands of trees. This storm was estimated as a 200-500 year event. Power was out up to 10 days in some areas and 700,000 acres of forest were damaged in Vermont. Amazingly, there were no fatalities in Vermont, unlike Quebec where 3 million people lost power and 28 were killed.

Over the past few winters, Pittsfield has received numerous snow storms that have dropped significant amounts of snow over a day or two. However, the details of these events and the damage they caused are overshadowed by winter weather events of the past. This is not to say such extreme events will not repeat themselves. It should be assumed that extreme winter weather events will occur at some point in the future. The following table documents the occurrence of extreme cold/snow/ice storms in the Town of Pittsfield and Rutland County.

History of Occurrences:

Date	Event	Location	Extent
02/13/2014	Winter Storm	County-wide	Roughly 16 inches of snow fell throughout the region, closing schools and causing many road accidents throughout the state.
01/02/2014	Winter Storm	County-wide	Winter Storm Hercules brought over a foot of snow to the region. This was followed by freezing rain and ice in the days that followed, impacting road travel for many.
03/18/2013 – 03/19/2013	Winter storm	County-wide	8-14” of snow fell across the county, with higher amounts above 1000 ft. Numerous vehicle accidents.
02/27/2013— 02/28/2013	Winter storm	County-wide	Snow across the county, 6-12” of snow fell across the southern Green Mountains.
12/29/2012— 12/30/2012	Winter storm	County-wide	Snowfall totals across the county were generally 5-8”.
03/01/2012	Winter storm	County-wide	10-14” inches along the eastern slopes of the Green Mountains.
11/22/2011— 11/23/2011	Winter storm (heavy, wet snow mixed with rain and sleet)	County-wide	6-12” across the county. Numerous vehicle accidents, scattered power outages due to heavy snow on trees.
03/06/2011— 03/07/2011	Winter storm	County-wide	4-16” across the county.
10/25/2010	Winter Storm	County-wide	A winter storm struck Rutland Co., causing $115k in property damage.
02/23/2010	Winter Storm	County-wide	A winter storm struck Rutland Co., causing $208k in property damage.
04/12/2007	Winter Storm	County-wide	A wintry mix of heavy wet snow, sleet and rain fell on Vermont, leaving as much as 6—10 inches in higher elevations, causing treacherous road conditions, downed tree limbs, and downed power lines. Pittsfield received 7 inches during the storm, and there was $5k in property damage county-wide.

Date	Event	Location	Extent
02/14/2007	Winter Storm	County-wide	A winter storm struck Rutland Co., causing $237k in property damage.
04/04/2003—04/05/2003	Winter Storm	County-wide	Snowfalls of between 10 to 20 inches fell throughout the region, including 18.5 inches in the nearby city of Rutland. Numerous traffic accidents were reported, and I-91 was closed for a time. $40k in property damage was reported for Rutland Co.
01/07/2002	Heavy Snow	County-wide	Residents woke to between 6-15 inches of snowfall the morning of the 7th. Power outages were reported throughout Rutland County, and a number of schools were forced to close. Property damage in Rutland Co. was estimated to be around $20k.
03/05/2001-03/07/2001 (EM-3167)	Winter Storm	County-wide	Snow overspread Vermont on 3/5, becoming steady by afternoon and heavy at times. Many schools were closed, and many Town Meetings were postponed. Several accidents were reported, and portions of I-91 were closed for a time. Roughly 20-30 inches of snow fell in the region. A total of $100k in property damage was reported for the region.
12/16/2000-12/18/2000 (DR-1358)	Severe Storms	County-wide	Storms and subsequent flooding caused damage to public property over the period of December 16-18.
03/21/1998	Heavy Snow	County-wide	Heavy snows over the weekend caused numerous traffic accidents and brief power outages. Snow accumulations totaled between 15-20 inches in most areas. $15k in property damage was reported for the region.
01/07/1998 – 01/09/1998 (DR 1201 VT)	Ice Storm	County/region-wide	Catastrophic ice storm throughout New England and portions of Canada. Power outages and fallen trees reported.

The Town of Pittsfield is no stranger to winter weather and the hazards that it brings. Depending on the event, particularly with heavy, wet snow or ice, electricity may be knocked out for a few hours or days. Green Mountain Power, the utility company currently serving the Town of Pittsfield follows a regular tree-trimming schedule. Pittsfield town officials believe this is satisfactory to mitigate damage and the power outages caused by downed trees and tree limbs during a heavy, wet snow or ice event. In the event of an extended power outage, the Town would open one or both of its emergency shelters. The Town Office, the Fire House, and the Pittsfield Federated Church serve as emergency shelters. While the Town Office and the Church are not currently serviced by a backup generator, the Fire House does have a portable generator for use in the event of a power outage

Heavy, wet snow or large quantities of snow may also leave structures vulnerable to roof collapse. Roof collapse occurs when the structural components of a roof can no longer hold the weight of the snow. Flat roofs are most vulnerable to collapse because they do not drain well and the snow on the roof soaks up water like a sponge, increasing the weight that the roof must bear. More common it seems is the collapse of barns commonly used for livestock sheltering and other agricultural purposes. Unfortunately, livestock in the barn are often killed and equipment stored in the barn may be damaged or ruined. It is difficult to determine whether a residential structure or a barn would be rebuilt after a roof collapse, because the decision to rebuild would likely depend on the extent of damage. The collapse of a barn roof is likely to be a total loss, and the collapse of a house roof may be a 50% loss.

While roof collapse has not occurred in Pittsfield recently, very heavy snow in the region on February 14, 2007 resulted in the partial or total collapse of 20 or more barn roofs, and led to the deaths of more than 100 cattle.

In general, winter weather is most hazardous to travelers. Icy and snow-covered roads present multiple examples of dangerous driving conditions and situations. In Pittsfield, the mountainous terrain, steep slopes, and remoteness of some roads further complicate travel. The Town relies on Travel Advisories issued by the State of Vermont Department of Emergency Management Homeland Security and the National Weather Service to alert residents of dangerous travel weather. However, it is difficult to prohibit people from driving during winter weather events. As a result, emergency services personnel must always be prepared to provide assistance to stranded drivers or to those who have been in an accident.

Hazard	Location	Vulnerability	Extent	Estimated/ Potential Impact	Likelihood/ Probability
Extreme Cold/Snow /Ice Storm	Town-wide	The entire Town is vulnerable, including road infrastructure, town and privately owned buildings, utility infrastructure.	Snow fall has varied, from a few inches to over a foot or more. Heavy snow and wind downed trees and power lines. Snow/ice contributed to hazardous driving conditions.	For roof collapse: Monetary damages will depend on each structure but, collapse of barn roof is often a total loss. This does not include the loss of livestock. Collapse of a house roof may be at a 50% loss. For car crashes due to poor driving conditions: minimal damage to vehicle to totaled vehicle. Health impacts could vary significantly.	Highly likely

4. Flash Flood/Flood/Fluvial Erosion

Flooding is one of the worst threats to Pittsfield's residents and infrastructure. Past instances of flooding in Pittsfield have included rain and/or snowmelt events that cause flooding in the major rivers' floodplains and intense rainstorms over a small area that cause localized flash-flooding. Both kinds of events can be worsened by the build-up of ice or debris, which can contribute to the failure of important infrastructure (such as culverts, bridges, and dams).

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Flash Flood/Flood/Fluvial Erosion**.

The worst flood disaster to hit the Town of Pittsfield, as well as the overarching region and the State of Vermont, occurred on November 3, 1927. This event was caused by nearly 10 inches of heavy rain from the remnants of a tropical storm that fell on frozen ground. 84 Vermonters, including the Lieutenant Governor, were killed. The flooding in the White River valley was particularly violent, with the river flowing at an estimated 900,000 gallons per second on the morning of the 4th (Vermont Weatherbook).

Like many towns in the region, the Town of Pittsfield received heavy precipitation, in the region of eight inches of rain over the course of the storm.

A more recent flood that devastated the region and the state was the result of Tropical Storm Irene, which occurred on August 28, 2011. Record flooding was reported across the state and was responsible for several deaths, and millions of dollars of home, road and infrastructure damage. Due to the strong winds, 50,000 Vermont residents were initially without power, and many did not have electricity restored to their homes and businesses for over one week. Despite the damage wrought, the flooding caused by Tropical Storm Irene is considered to be the second greatest natural disaster in 20th and 21st century Vermont; second only to the Flood of 1927.

The Town of Pittsfield suffered major damage to property and infrastructure during Tropical Storm Irene, although no lives were lost. It is estimated that Tropical Storm Irene dropped 6-7 inches of rain over the Town of Pittsfield in a very short span of time, and 5-7 inches across the county. It is thought that the flooding that occurred as a result of the storm was close to or a full-fledged 500 year flood. Many of Pittsfield's roads and culverts were damaged by the storm, notably destroying parts of VT Route 100 between Killington and Stockbridge. As a consequence of this damage, vehicular travel in and out of Pittsfield was hampered for weeks, making the town one of the most isolated in the state following the flood. Floodwaters completely destroyed the Giorgetti Covered Bridge as well as eight homes. The county-wide property damage totaled $12.5 million along with $1.5 million in crop damage. Following the flood damage, the state of Vermont and FEMA have coordinated on the home buy-out process across the state. There have been six buy-outs in the town, which have been purchased by the town.

Unfortunately, flooding is very common across the region, with many events impacting the Town of Pittsfield specifically. Flooding is one of the worst threats to Pittsfield's residents and infrastructure. The following list indicates the history of occurrence with regard to this hazard in Rutland County (given the small population of Pittsfield, town-specific data is limited); an asterisk "*" denotes the few instances in which town-specific data is available, and federal disaster numbers are listed where appropriate.

History of Occurrences:

Date	Event	Location	Extent
06/25/2013-07/11/2013 (DR-4140)	Flooding	County-wide	Severe storms and flooding across the region between 6/25-7/11/2013. Severe storms, lightning, wind and hail were reported along with damage throughout the county and surrounding areas.
08/28/2011* (DR 4022 VT for period of 8/26/2011 – 9/2/2011)	Severe Flash Flooding	Pittsfield, County-wide	5-7" of rain across region, significant damage to roads/culverts. $1,062,516.07 in damage total for Pittsfield according to FEMA's Public Assistance database (captures at least 70% of total damage)
06/28/2008	Flash Flooding	County-wide	Heavy afternoon and evening rains from numerous showers and thunderstorms caused flash flooding throughout the Rutland County region. Many road closures and flooded basements were reported along with $100k in property damage in the region.

Date	Event	Location	Extent
06/14/2008	Flash Flooding	County-wide	Numerous showers and thunderstorms hit Rutland County during the afternoon and evening, causing localized heavy rainfall of 3-5 inches in Rutland County. Many roads and culverts were washed out in the flooding. Over $800k in property damage was reported in the region.
4/15/2007 - 4/21/2007 (DR 1698 VT)	Flooding	County-wide	The storms of April 15-21 caused heavy rain and snow and high winds across Vermont leading to considerable utility and road damage.
4/12/2001-4/14/2011	Flooding	County-wide	1-2" of rain and snowmelt caused flooding throughout the region.
12/16/2000-12/18-2000 (DR-1358)	Flooding	County-wide	Severe storms caused flooding and damage to public property over the period of December 16-18.
7/14/2000 - 7/18/2000 (DR 1336 VT)	Flooding	County-wide	Severe storms caused flooding and damage to public property over the period of July 14-18.
9/16/1999 - 9/21/1999 (DR 1307 VT)	Flooding	County-wide	Tropical Storm Floyd brought heavy rains, high winds and flooding from Sept. 16-21.
6/17/1998 - 7/13/1998 (DR 1228 VT)	Flooding	County-wide	Severe storms caused flooding and damage to public property over the period of June 17-Aug. 17.
6/28/1973 - 6/30/1973	Flooding	Pittsfield, County-wide	8.53" reported in nearby Rochester, Vermont. Pittsfield-specific data could not be found.
11/2/1927 – 11/4/1927* ("The 1927 Flood")	Flash flooding	Pittsfield, County-wide	8" of rain fell in the area, prompting significant flooding.

The Town of Pittsfield Flood Hazard Area Regulations prohibits new structures in floodway areas and places restrictions on other types of activities located in special flood hazard areas outside of the floodway. The regulations establish that all development shall be reasonably safe from flooding. All new construction and substantial improvements to existing structures must be elevated to at least flood elevation levels, and manufactured homes must meet this requirement also or be securely anchored to resist flotation, collapse and lateral movement.

There are 24 residential (three mobile homes, twenty single-family dwellings and one multi-family dwelling) and 3 commercial/industrial/public structures in the 500-year floodplain, which equal $6,972,000 if all properties were damaged/destroyed in a severe flooding event. Additionally, there are six structures located within the river corridor, which is defined as the "land area adjacent to the river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel," according to state statute (10 V.S.A. § 1422(12)). For the purposes of this Plan, the 500-year floodplain was chosen as a basis for this analysis to demonstrate the number of Pittsfield properties that are or may be vulnerable to flooding. In addition, the flooding that occurred as a result of Tropical Storm Irene is considered to be greater than a 100-year flood. Therefore, in order to be more forward-looking, the damage to structures in the 500-year floodplain is documented in this plan.

Across Vermont, most child and elder care facilities are not registered with the State. Most child day care is private in-home in Pittsfield, and there are no licensed facilities. There are no elder care facilities in the Town of Pittsfield, though there is a growing need for both elder housing and childcare facilities for the Town's residents. In the event of severe flooding, any future facilities established in the Town

would be evacuated. Finally, low income housing is not registered with the State, and there are no mobile home parks in Pittsfield.

Recent studies have shown that the majority of flooding in Vermont is occurring along upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. These areas are often not recognized as being flood prone and property owners in these areas are not typically required to have flood insurance (DHCA, 1998). It should be noted that, while small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Map), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be very erosive, causing damage to road infrastructure and to topographic features including stream beds and the sides of hills and mountains. The presence of undersized or blocked culverts can lead to further erosion and stream bank/mountain side undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently. There is one residential structure located in the fluvial erosion hazard zone.

Pittsfield maintains an up-to-date list of culverts and culvert condition, and has engaged in culvert upgrading since the 2011 Pittsfield Annex was drafted. The process of upgrading culverts is currently in process. No development projects are planned in Pittsfield in areas that would be vulnerable to flooding. There are no repetitive loss properties in Pittsfield on FEMA's NFIP list.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/ Probability
Flooding	Areas adjacent to and surrounding Route 100; West Branch of the Tweed River; Pittsfield village center.	Culverts, bridges, road infrastructure. Approximately 24 residences and 3 commercial buildings in 500-year floodplain.	Most recent, Tropical Storm Irene- 5-7" across county (6-7" in Pittsfield).	From TS Irene: $1,062,516.07 for Pittsfield from FEMA's Public Assistance database.	Highly likely

5. Severe Weather (Thunderstorm, Lightning, High Winds, Hail, Flooding)

More common than hurricanes or tropical storms are severe thunderstorms (usually in the summer), which can cause flooding as noted above, and are associated with lightning, high winds, hail and tornadoes. Hailstorms have occurred in Vermont, usually during the summer months. While local in nature, these storms are especially significant to area farmers, who can lose entire fields of crops in a single hailstorm. Large hail is also capable of property damage. 382 hail events were recorded between 1950 and 2008 in the state, making hail an annual occurrence in some part of the state. Most of these events had hail measuring .75 inches, but many had hail at least 1.5 inches in size. The largest hail during the period was 3-inch hail that fell in Chittenden County in 1968 (NCDC). Tennis ball-sized hail was reported in the

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Severe Weather (Thunderstorm, Lightning, High Winds, Hail, Flooding)**.

town of Chittenden during a storm in the summer of 2001. Thunderstorms can generate high winds, such as hit the region on July 6, 1999, downing hundreds of large trees in a few minutes.

In Pittsfield, severe weather is quite common, typically in the late spring and summer months when the region experiences high temperatures. Severe thunderstorms tend to bring other hazards such as high winds, hail, lightning, and flooding, and these hazards are often experienced in combinations which create many unique weather and emergency management situations. Over the years, Pittsfield has been hit with high winds that have downed and uprooted numerous trees, and knocked out electricity to residents in the Town. Town specific wind data could not be found, but the "Remarks" section of NCDC Database helps to illuminate the impact strong winds can have on Pittsfield. Sizeable hail has also accompanied storms moving through the Town and region.

The following list indicates the history of occurrence with regard to this hazard in Rutland County (given that small population of Pittsfield, town-specific data is limited); an asterisk "*" denotes the few instances in which town-specific data is available, and federal disaster numbers are listed when appropriate. In an attempt to capture the individual hazards that may arise, and the different circumstances caused by the hazards in concert, the separate hazards are documented in the table below.

History of Occurrences:

Severe Weather Date	**Event Characteristics**					**Location**	**Extent**
	Thunderstorm / severe storm	Flooding	Hail	High Winds	Lightning		
07/18/2013*	✓		✓			Pittsfield	Strong, isolated thunderstorms brought large hail up to golf ball size as well as torrential rains.
06/25/2013-07/11/2013 (DR-4140)	✓	✓	✓	✓	✓	County-wide	Severe storms and flooding across the region between 6/25-7/11/2013.
06/08/2012	✓		✓	✓		County-wide	Quarter- to ping-pong-sized hail reported.
08/21/2011	✓		✓	✓		County-wide	Microburst/straight-line winds caused winds of 70-90mph. Numerous downed trees, downed power lines, damage to cars and crops reported.
07/19/2010*	✓		✓	✓		Pittsfield, County-wide	Hail up to 1" in diameter. Trees down on power lines along Upper and Lower Michigan Road.
7/10/2010*			✓			Pittsfield, County-wide	.5-1" hail
05/26/2010	✓		✓	✓		County-wide	Numerous trees down, a great deal of property damage in the region ($100k). Winds up to 70 kts.

Severe Weather Date	Event Characteristics					Location	Extent
	Thunderstorm / severe storm	Flooding	Hail	High Winds	Lightning		
08/25/2007	✓		✓	✓		Pittsfield, County-wide	Trees and power lines downed by winds in Pittsfield and surrounding communities. Over $600k in property damage, and winds up to 60 kts.
4/15/2007 – 4/21/2007 (DR 1698 VT)	✓	✓				County-wide	Severe storms caused localized flooding throughout the region.
05/18/2004	✓		✓	✓		County-wide	Hail up to 1" in diameter in some areas, 1-2,000 people without power in the county. $10k in property damage and winds at 74 kts.
6/29/2003*					✓	Pittsfield, County-wide	Numerous lightning strikes, a few tree fires resulted
7/4/2002*	✓			✓		Pittsfield, County-wide	Downed trees, wind damage
7/10/2001*	✓		✓	✓		Pittsfield, County-wide	Multiple downed trees, winds up to 75 kts.
7/14/2000 – 7/18/2000 (DR 1336)	✓	✓				County-wide, especially west portion	Localized heavy rains throughout the region.
6/17/1998		✓				County-wide	Flash flooding
1/19/1996 – 2/2/1996 (DR 1101 VT)		✓				County-wide	
6/27/1994	✓		✓	✓		East Pittsfield, Pittsfield, County-wide	Numerous downed, snapped, uprooted trees. Up to golf-ball sized hail in nearby Randolph.
8/6/1989	✓			✓		County-wide	
6/6/1984 – 6/8/1984 (DR 712 VT)	✓	✓				County-wide	
8/5/1976 (DR 518 VT)	✓	✓		✓		County-wide	
7/6/1973 (DR 397 VT)	✓	✓				County-wide	Severe storms; landslides

One of the main hazards caused by severe storms in the Town is flooding. The Town maintains an up-to-date culvert inventory in-house, and its work to upgrade culverts remains in process. Several steel culverts have been replaced with plastic culverts.

There have also been recently recorded wind and hail events in conjunction with severe storms. On July 18, 2013, severe storms caused torrential rains and golf ball-sized hail in Pittsfield. Similarly, three years earlier on July 19, 2010, there were reports of hail as big as 1.25 inches in diameter. As a consequence of the winds that were also associated with that severe storm, many trees came down on Upper and Lower Michigan Road. To help mitigate wind damage and damage to power lines, the Town and Green Mountain Power work to clear overhanging and dangerous trees.

Hazard	**Location**	**Vulnerability**	**Extent**	**Impact**	**Likelihood/ Probability**
Severe Weather	Town wide for wind, hail, high winds, lightning and thunderstorm impacts. For flooding impacts, areas adjacent to and surrounding Route 100; West Branch of the Tweed River; Pittsfield village center.	Town and private buildings, and utilities; culverts, bridges, road infrastructure.	07/18/2013: severe storms caused torrential rains and golf ball-sized hail in Pittsfield.	Damage from the 07/18/2013 storm is unknown, but it was likely minimal.	Highly likely

VI. Mitigation

A. Mitigation Goals

1. To reduce injury and losses from the natural hazard of high winds.
2. To reduce injury and losses from the natural hazard of ice jams
3. To reduce injury and losses from the natural hazard of extreme cold/snow/ice storms.
4. To reduce injury and losses from the natural hazard of flash flooding/floods/fluvial erosion.
5. To reduce injury and losses from the natural hazard of severe weather.

B. Town Plan Goals & Objectives Supporting Local Hazard Mitigation

- To encourage the healthful and convenient distribution of population, employment opportunities, and other activities, and to protect residential, agricultural, and other areas from undue concentrations of population and overcrowding of land and buildings from traffic, congestion, from inadequate parking and invasion of through traffic, and from the loss of peace and privacy (page 10).
- To maintain a transportation system that is safe and efficient and that complements the other goals and policies of this Plan (page 40).
- It is the policy of the Town to encourage new business development in appropriate locations where services such as roads, fire protection, and power supply are available or planned (page 45).
- To recognize that upland areas adjacent to unstable rivers and to steep streams may be at risk of erosion during floods (p. 60).
- To maintain or improve surface water quality and quantity (p. 61).

The Pittsfield Town Plan was updated and adopted on August 28, 2010, and has a 5 year lifespan.

C. Hazard Mitigation Strategies: Programs, Projects & Activities

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3)(ii), 201.6(c)(3)(iii) and 201.6(c)(3)(iv).

Vermont Division of Emergency Management & Homeland Security encourages a collaborative approach to achieving mitigation at the local level through partnerships with Vermont Agency of Natural Resources, VTrans, Vermont Agency of Commerce and Community Development, Regional Planning Commissions, FEMA Region 1 and others. That said, these agencies and organizations can work together to provide assistance and resources to towns interested in pursuing hazard mitigation projects.

With each mitigation strategy, general details about the following are provided: local leadership, possible resources, implementation tools, and prioritization. The prioritization category is based upon the economic impact of the action, Pittsfield's need to address the issue, the cost of implementing the strategy, and the availability of potential funding. The cost of the strategy was evaluated in relation to its benefit as outlined in the STAPLEE guidelines.

Strategies given a “High” prioritization indicate they are either critical or potential funding is readily available, and should have a timeframe of implementation of less than two years. A “Medium” prioritization indicates that a strategy is less critical or the potential funding is not readily available, and has a timeframe for implementation of more than two years but less than four. A “Low” prioritization indicates that the timeframe for implementation of the action, given the action’s cost, availability of funding, and the community’s need to address the issue, is more than four years.

The Town of Pittsfield understands that in order to apply for FEMA funding for mitigation projects that a project must meet more formal FEMA benefit cost criteria. The Town must have a FEMA approved Hazard Mitigation Plan as well.

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
All Hazards	*Ensure that Pittsfield’s Local Emergency Operations Plan (LEOP) is kept up-to-date, identifies vulnerable areas and references this Plan.*	Emergency Management Coordinator	High	Local resources; TRORC	Annually
	Consistently document town-owned infrastructure damage after weather events.	Road Commissioner; Selectboard; Town Clerk	High	Local resources; Vermont Agency of Transportation	As needed
	Take advantage of the Annual Report as a way to educate and inform residents; and as an information exchange between the Town and its residents.	Town Clerk; Selectboard	High	Local resources	Annually
	Investigate the creation of, and develop a resident phone tree for emergency situations in Pittsfield.	Emergency Management Coordinator	Medium	Local resources	2 years

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
High Wind// Severe Weather // Extreme Cold/Snow/ Ice Storm	*Clear and maintain town road rights-of-way, and work with local utilities to request that utility corridors are cleared and maintained, as needed.*	Road Commissioner	Medium	Local resources; Green Mountain Power	As needed
	Create a list of town-owned and privately-owned equipment to help with the removal of downed trees, and also list individuals who have access and the ability to operate such equipment.	Road Commissioner	Medium	Local resources	1 year; update bi-annually
Extreme Cold/Snow/Ice Storm	*Maintain a list that identifies populations vulnerable to extreme cold and make a plan to assist them, if necessary, in the event that it occurs.*	Emergency Management Coordinator; Local EMS	High	Local resources; TRORC; EMS	Annually
	Continue to plan for, budget and maintain roads for safe winter travel.	Selectboard; Road Commissioner	High	Local resources; Vermont Agency of Transportation	Annually
	Distribute a "safe winter driving" pamphlet and also include in the Annual Report.	Emergency Management Coordinator	Medium	Local resources; Vermont Agency of Transportation	1-2 years
Ice Jams	*Monitor river ice conditions during periods of high ice jam threat.*	Emergency Management Coordinator; Road Commissioner; Adjacent residents/ riparian landowners;	High	Local and state resources	As needed (winter)
	Develop a plan for responding to ice jams on the West Branch of the Tweed River.	Emergency Management Coordinator	Medium	Local and state resources	2-3 years

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
Ice Jams	*Develop an education piece about ice jams and the dangers associated with them; and include in the Annual Report.*	Fire Chief, with help from the Planning Commission	Medium	Local and state resources	2-3 years
Ice Jams// Flash Flood/ Flood/ Fluvial Erosion	*Maintain, review and enforce the town's newly adopted and strengthened flood hazard regulations, which include river corridor /fluvial erosion hazard language. Use this language for hazard mitigation purposes.*	Administrative Officer; Planning Commission; Selectboard	High	Local resources; TRORC	Annually/As needed
	Support the Route 100 bridge project, at BR 126 over the West Branch of the Tweed River, which will help to mitigate the threat of ice jams (current bridge has a center column where ice and debris can get hung up, and the new bridge will not have a center column).	Vermont Agency of Transportation; Selectboard	Low	State and federal resources	2-5 years and beyond
Flash Flood/ Flood/ Fluvial Erosion// Severe Weather	*Maintain and update town bridge and culvert inventories. Regularly inspect and maintain town bridges and culverts; and develop a schedule to replace undersized culverts.*	Road Commissioner	High	Local resources; TRORC; White River Partnership; Vermont Agency of Transportation; VT ANR River's Program	Annually
	Proceed with and close on the home- buyout property on 113 Park Place.	Town Lister; Selectboard	High	Local and state resources; FEMA's Hazard Mitigation Grant Program	6-12 months
	Complete work on the buyout properties to return these lands to open space.	Town Lister	High	Local and state resources; FEMA's Hazard Mitigation Grant Program	6-12 months

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
	Support two Route 100 bridge projects; (1) replace BR 124 over the Tweed River (currently a temporary bridge), and (2) bridge BR 126 over the West Branch of the Tweed River.	Vermont Agency of Transportation; Selectboard	Low	State and federal resources	2-5 years and beyond
	Consult with Vermont ANR's River's Program for potential riverbank and floodplain stabilization projects. Seek grant funding for recommended projects.	Planning Commission	Low	Local and state resources; TRORC; White River Partnership	3-5 years
	Upgrade 18" steel culvert on Hawk Lane to a 30" plastic culvert (the 18" culvert continually plugs up and a hydraulic study determined that is was undersized).	Road Commissioner	High	Local and state resources	6 months-1 year

Certificate of Adoption

The Town of Pittsfield
Select Board
A Resolution Adopting the Local Hazard Mitigation Plan
_____, 2014

WHEREAS, the Town of Pittsfield has worked with the Two Rivers-Ottauquechee Regional Commission to identify hazards, analyze past and potential future losses due to natural and manmade-caused disasters, and identify strategies for mitigating future losses; and

WHEREAS, the Pittsfield Local Hazard Mitigation Plan contains several potential projects to mitigate damage from disasters that could occur in the Town of Pittsfield; and

WHEREAS, a duly-noticed public meeting was held by the Town of Pittsfield Select Board on _____ __, 2014 to formally adopt the Pittsfield Local Hazard Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Pittsfield Select Board adopts the Pittsfield Local Hazard Mitigation Plan Update.

_____
Chair of Select Board

_____
Member of Select Board

ATTEST

Appendices

Appendix A: Hazard Ranking Methodology

Frequency of Occurrence Probability	Warning Time Amount of time generally given to alert people to hazard	Potential Impact Severity and extent of damage and disruption
1 = *Unlikely* <1% probability of occurrence in the next 100 years 2 = *Occasionally* 1–10% probability of occurrence per year, or at least one chance in next 100 years 3 = *Likely* >10% but <100% probability per year, at least 1 chance in next 10 years 4 = *Highly Likely* 100% probable in a year	1 = More than 12 hours 2 = 6–12 hours 3 = 3–6 hours 4 = None–Minimal	1 = *Negligible* Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries 2 = *Minor* Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries 3 = *Moderate* Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities 4 = *Major* Severe property damage on a town-wide or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

Appendix B: Critical Stream Crossings

Critical crossings in the table below includes stream crossing structures on town highways that cross third order streams or larger. Headwater streams generally include first through third order. Third order was included as these headwater streams will have larger drainage areas and may have larger structures that are more difficult to replace and have a larger impact on the road network. Most of these are bridges. Structures that have a "Y" in the "AOTSTRUCT" column are state-owned.

RDFLNAME	STRUCT_NUM	CATEGORY	STRUCTYPE	STRC_LBL	AOTCLASS	X_COORD	Y_COORD	AOTSTRUCT
FORSHA RD	401115000511151	B	TS	B5	3	-72.8032	43.7863	Y
LIBERTY HILL RD	401115000711151	B	TS	B7	3	-72.8022	43.7864	Y
TWEED RIVER DR	101115001111151	B	TL	B11	0	-72.8175	43.7635	
PARAMENTER PL	101115000911151	B	TL	B9	0	-72.8139	43.767	
TOWNSEND BROOK RD	101115000811151	B	TL	B8	0	-72.8259	43.7509	
BAKERS RD	101115001011151	B	TL	B10	0	-72.8211	43.7468	
FELLOWS RD	101115001311151	B	TL	B13	0	-72.8233	43.7277	
CROSSOVER RD	101115001211151	B	TL	B12	0	-72.8355	43.7734	

The critical crossings in the table below includes significantly undersized structures, usually culverts, which were identified from the ANR-DEC stream geomorphic assessment survey with openness ratios less than 50%. This measure refers to when structure's width is less than half of the stream bankfull width. Several of these structures may have been damaged during TS Irene or other events and may have been replaced. The town, at some point, should look at these sites and assess their status and need for repair/upgrades.

RDFLNAME	GROUP_TWO	CATEGORY	X_COORD	Y_COORD	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	AOTSTRUCT	OpennesssR	ChannelWid
LIBERTY HILL RD	Y	C	-72.804	43.7942	4	3	40		0.3	8

Attachments

Attachment A: Map of Pittsfield

Flood Region:
National Flood Insurance Program
Digital Flood Insurance Rate Map Data

Stream Geomorphic Assessment Data:
Obtained from the Data Management Sys.
Maintained by the VANR
River Management Program

Village Centers:
Designated by the State for,
historic tax credit and other benefits,
pursuant to 24 VSA sections 2793a

Floodplain eSITES	
RESIDENTIAL	
CAMP	1
MOBILE HOME	2
MULTI-FAMILY DWELLING	1
SINGLE FAMILY DWELLING	18
COM/IND/PUB	
COMMERCIAL	3
LODGING	
Grand Total	**28**

Pittsfield Fire + Rescue
Emergency Operations Center
Emergency Shelter

Greene Futures LLC
HazMat Storage

Federated Church
Emergency Shelter

Town Hall
Emergency Shelter

Town Office
Emergency Operations Center

C.V. Oil Inc.
HazMat Storage

Town Garage

Wilcox Peak RD
Moose RUN
Timberline DR
Hawk Mountain RD
Rorison Hill RD
Glen RD W
Hawk TRL
Hawk Pond RD
Upper Michigan RD
Hawk RUN
Hawk LN
Lois LN
West Branch Tweed River
Sugar Maple DR
Lower Michigan RD
Tweed River
Parmenter PL
W Branch Farm RD
Ob LN
STOCKBRIDGE
Tweed River DR
Dove DR
Vt Route 100
Park PL
Heritage HTS
Spring ST
Lookout RD
Bombadil PATH
River View TRL
The Commons
Townsend Brook RD
Bozier Hill RD

0 0.2 Miles

ROCHESTER
BETHEL
STOCKBRIDGE
CHITTENDEN
KILLINGTON
Inset

0 1.4 Miles

Hazard Mitigation Plan
Essential Services Map
Pittsfield, Vermont

- TH cls 1 (village VT rt)
- TH cls 2
- TH cls 2 gravel
- TH cls 3
- TH cls 3 gravel
- TH cls 4 impassable
- VT forest hwy
- trail
- private
- VT route
- US route
- US interstate
- TH cls 4 gravel
- TH cls 4 primitive
- Railroad
- Electrical Transmission

- Critical Facility
- Critical Stream Crossing
- Church
- Significantly Undersized Structure
- Culvert Under 18" Wide
- Bridge
- Green Mountain National Forest

- e911 in Floodplain
- e911 Within 1000' of Major Route
- e911 Address
- Designated Village
- Floodway
- 100 Year
- 100 Year, No BFE
- 500 Year

Two Rivers-Ottauquechee
Regional Commission
GIS Service Center
128 King Farm Rd
Woodstock, VT 05091
802-457-3188
trorc.org

Attachment B: Project Status Report for Bridge No. 124

VERMONT AGENCY OF TRANSPORTATION - PROJECT STATUS REPORT
As of 5/29/2014

GENERAL PROJECT INFORMATION

Project Name	:	PITTSFIELD	**Program**	:	STATE HIGHWAY BRIDGES
Project Number	:	ER BRF 022-1(23)	**Consultant Design**	:	NO
Responsible Division	:		**Operations District**	:	3
Road/Route	:	VT 100	**County**	:	RUTLAND COUNTY
Local Name	:		**Regional Plan. Comm.**	:	TWO RIVERS OTTAUQUECHEE REGIONAL COMMISSION
ARRA Funds	:	NO			
Project Description	:	REPLACEMENT OF BR124 OVER THE TWEED RIVER IN THE TOWN OF PITTSFIELD.			

CONTACT INFORMATION

Project Manager	:	HIGGINS,KRISTIN M	**Program Manager**	:	HEDGES,W M
Project Manager Phone	:	802-828-0053	**Program Manager Phone**	:	802-828-3877
Project Manager Email	:	KRISTIN.HIGGINS@STATE.VT.US	**Program Manager Email**	:	MIKE.HEDGES@STATE.VT.US
Town Contact	:				
Town Phone	:				

SCHEDULE INFORMATION

	Concept	Prelim	Envir. Doc	ROW Plans	ROW Clear	Final	Contract Plans	Bid Let
Date Accomplished	04/29/2011	11/02/2012	03/16/2012	04/03/2013	07/16/2013	07/19/2013	09/18/2013	11/01/2013

CONSTRUCTION INFORMATION

Contractor	:	COLD RIVER BRIDGES LLC	**Resident Engineer**	:	LUICHINGER,SARA
Low Bid Amount	:	$1,307,040.75	**Resident Engineer Phone**	:	828-2593
Contingency	:	$65,352.04	**Resident Engineer Email**	:	SARA.LUICHINGER@STATE.VT.US
Construction Engineering	:	$258,408.15			
Estimated Total Construction Cost	:	$1,630,800.94	**Anticipated Completion Date**	:	9/19/2014
Construction Funding Split	:	81% FEDERAL, 19% STATE, 0% LOCAL			

The project manager should be contacted directly for clarification of any information regarding the specified project.

Attachment C: Project Status Report for Bridge No. 126

VERMONT AGENCY OF TRANSPORTATION - PROJECT STATUS REPORT
As of 5/29/2014

GENERAL PROJECT INFORMATION

Project Name	:	PITTSFIELD	**Program**	:	STATE HIGHWAY BRIDGES
Project Number	:	BHF 022-1(24)	**Consultant Design**	:	NO
Responsible Division	:	STRUCTURES	**Operations District**	:	3
Road/Route	:	VT 100	**County**	:	RUTLAND COUNTY
Local Name	:		**Regional Plan. Comm.**	:	TWO RIVERS OTTAUQUECHEE REGIONAL COMMISSION
ARRA Funds	:	NO			
Project Description	:	REHABILITATION OF BRIDGE NO. 126 ON VT100 IN PITTSFIELD, OVER THE WEST BRANCH OF THE TWEED RIVER.			

CONTACT INFORMATION

Project Manager	:	BONNEAU,DOUGLAS E	**Program Manager**	:	HEDGES,W M
Project Manager Phone	:	802-828-3874	**Program Manager Phone**	:	802-828-3877
Project Manager Email	:	DOUGLAS.BONNEAU@STATE.VT.US	**Program Manager Email**	:	MIKE.HEDGES@STATE.VT.US
Town Contact	:				
Town Phone	:				

CAPITAL PROGRAM APPEARANCE

1-4 Year Program	:	YES
Development Evaluation	:	---
Candidate Project	:	---

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) APPEARANCE

PE	:	PROGRAMMED
ROW	:	
CONST	:	

SCHEDULE INFORMATION

	Concept	Prelim	Envir. Doc	ROW Plans	ROW Clear	Final	Contract Plans	Bid Let
Date Accomplished	01/07/2013		04/19/2013					

Anticipated Advertising Schedule : Project under development. Construction funds to be identified in future fiscal year.

COST INFORMATION

Construction Estimate	:	CATEGORY D ($1,000,000 TO $2,500,000)
Construction Funding Split	:	80% FEDERAL, 20% STATE, 0% LOCAL

The project manager should be contacted directly for clarification of any information regarding the specified project.