Town of Stockbridge, Vermont

Local Hazard Mitigation Plan

May 2014 Draft

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

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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 Local Hazard Mitigation Plan (hereafter referred to simply as the Plan) seeks to provide an all-hazards mitigation strategy that will make the community of Stockbridge 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 Plan is to assist Stockbridge in identifying all hazards facing the town, ranking them, and identifying strategies to reduce risks from known priority hazards.

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

The 2014 Stockbridge Local Hazard Mitigation Plan is the first stand-alone mitigation plan drafted for the Town. Previously, the Town had a town-specific 2009 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 Stockbridge town officials and residents who will implement the hazard mitigation strategies in the future.

III. Community Profile

The Town of Stockbridge is located in the northwestern portion of Windsor County, Vermont. It comprises an area of approximately 28,300 acres, or 45.41 square miles.

Stockbridge is located in the physiographic region known as the Intermountain Valleys and foothills of the Green Mountains. This area is characterized by mountainous terrain, narrow valleys and a few peaks above 2,500 feet. Stockbridge's narrow valleys are bisected by the White and Tweed Rivers and Fletcher and Stony Brooks.

A July 11, 2007 storm centered on six towns in central Vermont, including Stockbridge. Six to eight inches of rain fell during the event, with about three inches per hour falling in Stockbridge. At least $8 million in damages to roads and stream crossing structures occurred in towns. Stockbridge is also home to the Gaysville area, a hamlet that was totally destroyed in the 1927 flood. More recently, Tropical Storm Irene caused widespread damage to the Stockbridge community in August of 2011, destroying numerous properties and wiping out large swathes of roadway and other infrastructure, most notably Route 107 leading to Bethel.

According to the U.S. Census Reports, population levels have increased in Stockbridge since 1970. The population in Stockbridge for 2010 was 736. Compared to 618 in 1980, this was a 19.1% increase. The 19.1% rate of growth in Stockbridge was higher rate of growth than either Windsor County or the State of Vermont experienced (-1.3% and 2.8%, respectively).

There were 553 housing units in Stockbridge in 2010, according to the U.S. Census Reports. In 2000 there were 528 units, and in 1990 there were 488 housing units. The average annual rate of housing growth over the 2000s was 2.5 units, a marked decrease from the 4 housing units per year growth experienced over the 1990s and the 7.5 units per year experienced over the 1980s. The increase of 25 units, including second-homes, created a 4.7% rate of growth housing units in Stockbridge in the decade from 2000 to 2010. This rate was roughly half the State's rate of growth of 9.6%, and was also significantly lower than Windsor County's rate of 7.9%. Compared with its neighboring towns in the Two Rivers-Ottauquechee region (Barnard, Bethel, Bridgewater, Pittsfield, Rochester, and Royalton), Stockbridge had the lowest level of housing growth in the 2000s.

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

The Town is serviced by the Stockbridge Volunteer Fire Department. The Town participates in a mutual aid district with Bethel, Barnard, Rochester, and Pittsfield, whereby assistance is provided in the event of a serious fire.

First and second constables are elected annually at Town Meeting. The Vermont State Police, Troop "D" located in Royalton, responds to emergencies in Stockbridge, such as traffic accidents, breaches of the peace, or other criminal rather than civil emergencies. The Windsor County Sheriff's Department, located in Woodstock, does not provide emergency service to Stockbridge but will, for a fee, provide radar surveillance and prearranged security service.

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. The closest hospital is Gifford Medical Center, located in Randolph. 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 Stockbridge with updating its Hazard Mitigation Plan. Committee members who assisted with the revisions include:

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
Dave Brown	Road Commissioner	On 11/07/2013, Samantha Holcomb (TRORC) reached out to Mark Pelletier, the Stockbridge Selectboard Chair, offering assistance in updating and developing their new Hazard Mitigation Plan. TRORC staff coordinated with Stockbridge town officials to set up an introductory meeting. The first meeting was scheduled for 02/06/2014. TRORC's staff attended that meeting, followed by many more meetings in which participants revised and developed the HMP. See below for more meeting-specific details.
Cathy Brown	Town Clerk/Treasurer	
Willis Whitaker	Selectboard Member	
Mark Pelletier	Selectboard Member	
Mark Doughty	Selectboard Member	
Jim Shands	Emergency Management Coordinator	

Additional Participants in the Process:

- Bill Edgerton, Planning Commission
- Ryan Whitaker, Fire Chief

B. Plan Development Process

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

The 2009 Stockbridge Annex was originally part of the 2008 multi-jurisdictional Regional Hazard Mitigation Plan, drafted by Two Rivers-Ottauquechee Regional Commission, and approved by FEMA on September 30, 2008 with its first local annex. The Stockbridge Annex received subsequent FEMA approval, but, since it was part of a larger plan, FEMA treats its start date as September 30, 2008, meaning the Stockbridge Annex expired on September 30, 2013.

This Plan has been reconstructed now as a single jurisdiction, stand-alone Stockbridge 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.

The changes to this plan include:

- **General**
  - New sections: Plan Development Process, 2009 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**
  - Wildfire, Hazardous Material Spills, Structural Fire, Extreme Cold/Snow/Ice Storm, and Flash Flood/Flood/Fluvial Erosion remain on the list of "top hazards;"
  - Landslides have been removed from the list of "top hazards;"
  - For each hazard, a location/vulnerability/extent/impact/likelihood table has been added to summarize the hazard description.
- **Maps**
  - A map of the Town of Stockbridge depicting critical facilities, town infrastructure, and the NFIP designated floodway and 100-year floodplain has been added.

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

- **Activities**
  - 02/06/2014: Met with Stockbridge HMP committee members to introduce the update/plan development process, reviewed Stockbridge's existing Hazard Mitigation Plan (adopted in January 2009), considered the status of various mitigation actions, potential hazards, and the data collection/research process. During this meeting, the Stockbridge committee also discussed and ranked hazards to determine the "Top Hazards" in the Town. Explained to the committee what the next steps in the process are (draft plan, then schedule a meeting to review and discuss it).
  - 3/20/2014: Met with committee to discuss first draft. The entire draft was reviewed in detail, with TRORC staff making note of any comments or errors.
  - 5/1/2014: Met with Selectboard members, the Road Commissioner, the Town Clerk/Treasurer and Emergency Coordinator to develop a list of hazard mitigation actions to address the Town's top five hazards, as determined during the hazard ranking exercise on 02/06/2014.
- **Public participation and involvement** (*44 CFR 201.6(b)(1)*)

***Note: The meetings listed below were public sessions.*

  - 02/06/2014: Met with Stockbridge HMP committee members to introduce the update/plan development process, reviewed Stockbridge's existing Hazard Mitigation Plan (adopted in January 2009), considered the status of various mitigation actions,

potential hazards, and the data collection/research process. During this meeting, the Stockbridge committee also discussed and ranked hazards to determine the "Top Hazards" in the Town. Explained to the committee what the next steps in the process are (draft plan then schedule a meeting to review and discuss it).

- 3/20/2014: Met with committee to discuss first draft. The entire draft was reviewed in detail, with TRORC staff making note of any comments or errors.
- 5/1/2014: Met with Selectboard members, the Road Commissioner, the Town Clerk/Treasurer and Emergency Coordinator to develop a list of hazard mitigation actions to address the Town's top five hazards, as determined during the hazard ranking exercise on 02/06/2014.
- _____: TRORC staff attended a Selectboard meeting to inform Stockbridge residents about the work that had been done to update the Town's Hazard Mitigation Plan. The Selectboard agenda is posted at the Town Office, and the draft Hazard Mitigation Plan was posted on the Town's website in advance of the public information session. TRORC staff also asked for comments at the meeting, but none were received.

- **Governmental participation and involvement** *(44 CFR 201.6(b)(2)*)
  - Sent revised draft to Planning Commission Chair—05/12/2014
  - Sent revised draft to Division of Emergency Management and Homeland Security--_____
- **Neighboring community participation and involvement** *(44 CFR 201.6(b)(2)*)
  - 05/13/2014: A notice was placed on the Two Rivers-Ottauquechee Regional Planning Commission's website alerting readers that Stockbridge 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 towns' Selectboards for comment—05/12/2014
    - Towns of: Barnard, Bethel, Killington, Pittsfield, and Rochester.
- **Review of existing plans, studies, reports, and technical information** (*44 CFR 201.6(b)(3)*)
  - Stockbridge Hazard Mitigation Plan (Adopted 01/22/2009)
    - This Plan was referenced extensively during the plan development process, especially in regard to the worst threats and mitigation action strategies identified in 2009.
  - Stockbridge Town Plan (Adopted 07/01/2010)
    - The Town 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).

- Stockbridge Zoning Bylaws (Adopted 04/21/2011)
  - The Zoning Bylaws were referenced for general knowledge and for Stockbridge's Flood Hazard Regulations.

C. Status Update on Mitigation Actions Identified in 2009

The following table outlines the mitigation actions that were proposed in Stockbridge's 2009 All-Hazard Pre-Disaster Mitigation Plan for the Town of Stockbridge (adopted on January 22, 2009 as an appendix to the Two Rivers-Ottauquechee Regional Commission's multi-jurisdictional Pre-Disaster Mitigation Plan).

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

Participants in the new Plan update process reviewed these actions and reported on the status of each:

Mitigation Action	Who (Leadership)	When (Timeframe)	How (Funding/ Support)	2013 – Status of Mitigation Actions
<u>ALL HAZARDS</u> 1. Ensure that the Rapid Response Plan (RRP) is current.	Selectboard	Yearly	With TRORC assistance	☑ Complete. The latest iteration of RRP is the Local Emergency Operations Plan (LEOP). Stockbridge updates this document annually. Their most recent LEOP was updated and then adopted on 05/13/2013 by the Stockbridge Selectboard.
2. Use Pre-Disaster Mitigation (PDM) plan for Hazard Identification and Mapping	Emergency Management Coordinator	Ongoing	With TRORC assistance	In process. Maps are used to identify problematic areas needing attention.
<u>FLASH FLOOD/FLOOD</u> 3. Continue the planned road maintenance program and update existing culvert inventory. Upgrade culverts and ditching.	Highway Department	Ongoing	Local resources	In process. A culvert inventory was completed with assistance from TRORC in 2008/9. The town updates its inventory in-house on a routine basis.
4. Stabilize Tweed riverbanks in Chalet Village along Route 100 by Canton and Lucerne Dr.	Highway Department	2010	HMGP, PDM-C, state, and local resources	Incomplete.
5. Replace undersized culverts on Blackmer Blvd and Stockbridge Common.	Highway Department	2010	HMGP, PDM-C, state, and local resources	In process. Many culverts have been replaced in both areas, but some remain.
6. Stabilize riverbanks along Blackmer Blvd, Stony Brook Rd, Lilliesville Rd, and Whitcomb Hill Rd.	Highway Department	2010	HMGP, PDM-C, state, and local resources	In process. Roughly 75-80% complete as of early 2014.

7. Conduct buyouts of properties where streams threaten homes (Lilliesville Brook, Stony Brook and the Tweed River).	Selectboard	Ongoing	HMGP, PDM-C, state, and local resources, and private owners	With Tropical Storm Irene two years after the 2009 Plan's adoption, this became even more pressing. Properties along the following roads have been bought-out as of early 2014: Schaff Haus (11), Tweed (1), River Road (1), VT 100 (3), Fletcher Brook (1), and Canton Drive (1).
8. Adopt permanent revisions to flood regulations.	Planning Commission/ Selectboard	2009	TRORC assistance	Town does not have a standalone flood policy; however, it is addressed within other land use regulations.
9. Consider adopting Fluvial Erosion Hazard regulations.	Planning Commission and Selectboard	2009	Local resources, TRORC assistance	Incomplete.
<u>HAZMAT</u> 10. Pursue HAZMAT training for Fire Department.	Fire Department	2009	Fire Service Training Academy	Incomplete. Town has not had training since at least 2006.
<u>FIRE</u> 11. Obtain training and equipment appropriate that will allow the fire department to fight wildfires safely.	Fire Department	2009	USDA,Fire Service Training Academy, George Aiken RC&D	Incomplete. Town looked into purchasing new equipment (including a truck) in 2008, but never procured any.
12. Develop additional dry hydrant sites in rural locations.	Fire Department	Ongoing	Local resources, George Aiken RC&D	Complete. In 2013, three new dry hydrant sites were installed (Olmstead Drive, Lilliesville Brook Bridge, and a municipal hydrant in Stony Brook). There is also another that was added in Stockbridge Common in 2009.
<u>LANDSLIDE</u> 13. Stabilize potential landslides on Blackmer Blvd.	Road Foreman and Selectboard	2009	HMGP, PDM-C, state, and local resources	In process.
<u>WINTER STORM</u> 14. Encourage utilities to continue regular tree trimming	Emergency Planning Coordinator	Yearly	Local resources	In process. Crews routinely trim.

along power lines.				

Finally, there are no current plans for new development in the Town of Stockbridge.

D. Existing Hazard Mitigation Programs, Projects & Activities

The Town of Stockbridge 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

- Annual update of Stockbridge's Local Emergency Operations Plan (LEOP, formerly BEOP)
  - Last updated and approved on 05/13/2013
- Designation of Red Cross Shelter in progress
  - As of 5/1/2014

Insurance Programs

- Participation in National Flood Insurance Program (NFIP)
  - Stockbridge's initial Flood Hazard Boundary Map was identified on 11/1/74. The Town's initial Flood Insurance Rate Map (FIRM) was dated 9/4/86. The Town's FIRM has been updated, and the current effective map date is 9/28/07. The Stockbridge Zoning Administrator serves as the NFIP Administrator.

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

Land Use Planning

- Stockbridge Town Plan
  - Adopted on 07/01/2010, includes a "Flood Hazard Areas and Floodplains" element
- Stockbridge Zoning Bylaws
  - Adopted on 04/21/2011, includes a "Special Flood Hazard Area" (SFHA) zoning district

Hazard Control & Protection of Critical Infrastructure & Facilities

- Stockbridge Hazard Mitigation Plan
  - Adopted on 01/22/2009
- Culvert inventory with TRORC assistance in 2008/9.
  - Routine in-house updates occur on an on-going basis

Education/Public Outreach

- Public training related to Red Cross Shelter designation in progress
  - As of 5/1/2014

E. Plan Maintenance

This Plan (the Stockbridge Local Hazard Mitigation Plan) will be updated and evaluated annually at a May Selectboard meeting, along with the review of their Local Emergency Operations Plan (LEOP). 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.

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 directly impacting the Town of Stockbridge. The Town shall reference the Local Hazard Mitigation Plan when working on Town Plan amendments or changes to the Town's bylaws.

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).

The Two Rivers-Ottauquechee Regional Commission (TRORC) will help with Plan updates if assistance is requested by the Town of Stockbridge and if funding is available. If TRORC is unable to assist the Town, then Stockbridge'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 Herald of Randolph and the TRORC newsletter and blog, inviting the public to the scheduled Selectboard (or specially scheduled) meeting. Additional stakeholders should be invited to the meeting; these include: White River Valley Ambulance, Inc., the National Forest Service, 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 Town Clerk.

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.

Stockbridge 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 also recommended that the process work both ways and the Town review and incorporate elements of the Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/ fluvial erosion hazards (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 Stockbridge 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 Stockbridge, 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 Stockbridge 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 Stockbridge.[1] The worst threats (bolded in the table, below) are then followed-up with

[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).

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.

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

Hazard	Frequency of Occurrence	Warning Time	Potential Impact	Hazard Score
Wildfire	***Highly Likely***	***None***	***Minor***	***10***
Hazardous Material Spill	***Likely***	***None***	***Minor-Moderate***	***9.5***
Structural Fire	***Likely***	***None***	***Minor***	***9***
Extreme Cold/Snow/Ice Storm	***Highly Likely***	***6-12 hours***	***Minor-Moderate***	***8.5***
Ice Jams	Likely	3-6 hours	Minor-Moderate	8.5
Severe Weather (Thunderstorm, Lightning, High Wind, Hail and Flooding) *Note: We have defined "Severe Weather" to include two or more of the above hazards.	Highly Likely	6-12 hours	Minor	8
Hail Storms	Likely	None	Negligible	8
Flash Flood/Flood/Fluvial Erosion	***Likely***	***6-12 hours***	***Minor-Moderate***	***7.5***
Landslides/Mudslides/Rockslides	Occasionally	None	Negligible	7
Hurricanes/Tropical Storms	Occasionally	12+ hours	Moderate-Major	7
Invasive Species/Infestation	Likely	12+ hours	Negligible	5
Water Supply Contamination	N/A	N/A	N/A	N/A
Dam Failure	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Earthquake	N/A	N/A	N/A	N/A
Extreme Heat	N/A	N/A	N/A	N/A
Tornado	N/A	N/A	N/A	N/A

The Stockbridge HMP committee discussed the results of the hazard ranking activity and decided to focus on hazards that had the potential to impact the Town on a town-wide scale and/or had the potential to occur frequently. The committee recognized that, owing to the number of passenger vehicles and trucks passing through the town, there is always a threat that a large spill could occur, and, if it did, it would likely have a significant impact on Stockbridge.

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

- Wildfire
- Hazardous Material Spill
- Structural Fire
- Extreme Cold/Snow/Ice Storm
- Flash Flood/Flood/Fluvial Erosion

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 (please see each hazard profile for a hazard-specific matrix):

Hazard	**Location**	**Vulnerability**	**Extent**	**Observed 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 for "Top Hazards"

1. Wildfire

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 **Wildfire**.

Wildfire may be sparked by natural or human activities. Lightning is one of two main natural causes of wildfire. However, across the United States, approximately 90 percent of wildfires are started by humans. According to FEMA, there are three types of wildfire that can consume natural landscapes and man-made structures and features: surface fire, ground fire and crown fire. Surface fires are slow moving across the forest floor,

and, as a result, kill and damage trees. Ground fires are usually caused by lightning strikes, and burn on or below the forest floor. Crown fires, so called for their location in the crown of trees, effortlessly spread through tree tops, often aided by wind.

The Vermont landscape is especially vulnerable to wildfire during the period of time in early spring when all the snow has melted, vegetation has not begun to develop leaves, and the land and vegetation are very dry and/or dead. Roughly ninety percent of the Town of Stockbridge is forested land, and, of this, a portion is part of the federally-owned and controlled Green Mountain National Forest. Owing to the fact that the vast majority of the Town is forest, the Town is considerably vulnerable to the impacts of wildfires, were they to occur within Town bounds. Wildfires in the town have typically been the result of natural events (e.g., lightning strikes), human error and accidents, and downed power lines sparking brush fires.

The following occurrences were reported by the Committee. Both wildfires that have occurred in the last few years are thought to have been caused by people who built bonfires during a time when the landscape is especially vulnerable to wildfire. Their reports were supported with research of news stories, where possible (indicated with an asterisk*).

History of Occurrences:

Date	Event	Location	Extent
04/22/2013	Grass fire	Fletcher Brook Road, South Hill	The Stockbridge Fire Department responded to a report of a grass fire at 5365 Fletcher Brook Road in Stockbridge. The fire burned 1.8 acres with 1 acre being field and the other .8 being wooded.
10/19/2013	Forest fire	Stockbridge Common	The Stockbridge Department responded to a report of a Forest Fire at 192 Common Road. When we got there we found close to an acre burning out of control. We used close to 2200 gallons of water to extinguish.
04/24/2009	Forest fire	Taggart Hill Road	The Stockbridge Fire Department responded to a report of a forest fire at 659 Taggart Hill Road in Stockbridge. When we arrived on scene we found about half an acre burning with the wind blowing real bad.
07/15/2001	Forest fire	Lillieville Road	The Stockbridge Fire Department responded to a report of a forest fire under the power line at 10 Lillieville Road in Stockbridge. Found close to an acre burning and being driven by high winds.

In 2013, three new dry hydrant sites were installed that may be utilized to help combat wildfires in Stockbridge. These new hydrants are located on Olmstead Drive, Herkes, one in Gaysville, Lilliesville Brook Bridge, and Stony Brook, the latter of which is a municipal hydrant. There is also another hydrant that was added in Stockbridge Common in 2009. However, forest areas exist where ground-based firefighting efforts would be very difficult, due to their remoteness. This creates the potential for wildfire to impact private land and property and any logging operations occurring at the time of the wildfire. Areas that are of concern, due to remoteness, include South Hill and Vulture Mountain. A wildfire would likely impact or result in the damage of wildlife habitat and recreational lands used for hunting, hiking, mountain biking, and ATV and snowmobiling trails (maintained by VAST, Vermont Association of Snow Travelers).

Hazard	Location	Vulnerability	Extent	Estimated/ Potential Impact	Likelihood/ Probability
Wildfire	Woodland areas, notably South Hill and Vulture Mountain.	Private property, town buildings, utility infrastructure	Up to this point, the extent of damage has been minimal but all that is needed are the right conditions to experience a more damaging wildfire, especially because over 90% of the Town is forested.	Unknown—data gap.	Highly Likely

2. Hazardous Material Spill

Based on available VT Tier II data, there is one site in town that has sufficient types and/or quantities of hazardous materials to require reporting. Stockbridge's village is predominantly located along Routes 100 and 107 along the White and Tweed Rivers. No major, functioning interstate highways or railways run through or near the Town. There are 17 Tier II Critical Facilities in the Town, including one hazardous material storage facility. There are 217 residential and 21 commercial, industrial or public buildings within 1,000 feet of a potential HAZMAT spill on major roads, such as Routes 100 and 107. This includes the Town Clerk's Office, the fire department, and the Stockbridge Central School. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be $2,203,574. It should also be noted that the State of Vermont currently has one fully-trained HAZMAT response team, with vehicles located in Essex Junction, Brandon, and Windsor. The HAZMAT crew chief is available within minutes of a call for the team but on-scene response would be a matter of hours. In the event of a serious accident in Town, there would be little time for evacuation and response would be difficult.

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 **Hazardous Materials Spill**.

The following data was retrieved from the Vermont Department of Environmental Conservation's Spill List and by searching the archives of local newspapers. The table above is used to illustrate the ease with which trucks, trains and the day-to-day activities in the Town have the potential to create a hazardous material spill and dangerous conditions for emergency responders and town residents.

History of Occurrences:

Date	Event	Location	Extent
09/03/2013	Diesel, motor oil spill	Rt. 107 @mm 4.14	Spill occurred after a stolen dump truck went off the road and down a bank, puncturing the truck's oil pan and contaminating approximately a 9'x12' by 1' deep area of soil.

Date	Event	Location	Extent
08/22/2013	Hydraulic oil spill	Rt. 100 @ mm 3.59	Hose failure caused a 15 gallon spill from an hydraulic oil tank. AoT cleaned the affected pavement with pads and sand, and moved a 55-gallon truck full of debris to the Rochester AoT garage for temp storage.
06/23/2012	Fuel oil spill	Rt. 100	1000 gallon fuel oil spill at a private property from an AST orphaned during TS Irene.
04/18/2013	Hydraulic oil leak	Pit Road	A truck blew a hose at Harvey's Peavine Pit while unloading material at a gravel pit, resulting in a 15 gallon discharge spill that covered a 55'x6' area. EP&S hired by VTrans to perform clean-up. Soil had to be excavated.
10/06/2011	Kerosene Leak	Rt. 100	Neighboring property owner spotted an AST amongst numerous items washed downstream during TS Irene, and noticed it was leaking. CV Oil stopped the leak.
09/08/2011	Septic tank spill	White River Valley Campground	3 full septic tanks became flooded from TS Irene, and owner threatened to pump the waste out onto the ground at the camp (EEO had to investigate). Propane tanks were removed, handled by VHMRT.
06/24/2004	Transformer leak	Tweed River Road	Transformer on Pole 14-2 found empty; 5 gallons of transformer fluids leaked
10/31/2003	Diesel spill	Pouliout & Corriveau, Rts. 100 and 107	20 gallons of diesel spilled following a truck accident. Spill reached crushed stone, requiring polyencapsulation of contaminated soil for disposal elsewhere.
07/10/2003	Diesel spill	Pouliout & Corriveau, Rt. 100S	30 gallons of diesel spilled when a delivery hose fell apart, causing diesel to leak to nearby ditch and culvert. Clean-up completed by Irving, using booms and sorbents, etc.
03/05/2003	Diesel spill	Pouliout & Corriveau, Rt. 100S	50 gallons of diesel spilled as a result of an AST overfill. Spill largely contained by snow and ice on ground at the time, Irving handled clean-up.
03/12/2001	Diesel spill	Intersection of Rts. 100 and 107	A truck accident caused a 50 gallon diesel spill, but no clean-up was possible due to in being underneath snow and down a steep bank.
02/06/1989	Tank leak	Elementary school	240 gallons leaked from a tank at the school. NEMC did clean-up work to remediate.

While only a small number of major spills of hazardous material have occurred in the Town of Stockbridge, the potential for a major spill exists. Routes 100 and 107, particularly at their point of intersection, pose constant threats to the Town of Stockbridge. These routes serve as the main thoroughfares for trucks and other motor vehicles transporting a wide-range of goods, including a wide range of hazardous materials, within the Town of Stockbridge. A truck accident and a resulting hazardous material spill could be exceedingly disastrous for the Town and its residents. The majority of Routes 100 and 107 in the Town of Stockbridge are built very close to the Town's rivers, which could create additional water contamination problems if a hazardous material spill were to occur on either of these major routes.

In order to prepare for hazardous material spills in Stockbridge, 3 members of the Stockbridge Fire Department are trained to the HAZMAT Awareness level and 1 to the HAZMAT Operations level.

Hazard	Location	Vulnerability	Extent	Impact	Likelihood/ Probability
Hazardous Materials Spill	Routes 100 and 107 running along the White and Tweed Rivers.	Road infrastructure, nearby structures (ex. Town Clerk's Office or fire department if fuel tank struck), White River, Tweed River.	Initially, local impacts only; but depending on material spilled, extent of damage may spread (ex. into groundwater)	Within 1,000 feet of Route 107, Route 100, and other Class 2 roads, there are 217 residences and 100 commercial, industrial or public buildings. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be $2,203,574.	Likely

3. Structural Fire

Vermont has one of the highest per capita death rates from fire in the nation. This is, in fact, the deadliest form of disaster throughout the state. In 2010, there were 1,956 reported structural fires in the state, which included 5 fatalities and over $18 million dollars in damage. Although there have been requirements for smoke detectors in rental housing for over 20 years, and requirements for smoke detectors in single-family dwellings since 1994, there was only one building involved in the fatal fires in 2000 that had evidence of working smoke alarms.

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 **Structure Fire**.

Structure fires may occur at any point, and are typically initiated within a single fuel object. Smoke produced by the burning object forms a smoke plume and rises, creating a layer of smoke while also transporting heat to the smoke layer. Fire then spreads quickly by radiation from the flames, or from the smoke layer. Once other objects are engulfed, more smoke plumes are formed and heat radiates to other objects. Fire burns and moves across different materials depending on the material's composition, orientation, surface-to-mass ratio, and air supply in the structure/room.

The Town is typified by a number of old wooden town buildings, residences, and a number of commercial spaces, including New England's oldest Ford dealership. A review of the fires listed in the "History of Occurrences" chart below demonstrates the potential for structures located in the rural Town of Stockbridge to be completely or severely destroyed by fire.

The following occurrences were reported by the Committee or obtained from local sources. It is reasonable to assume that more structural fires have occurred in the period of time between the entries listed below, and that such fires have caused varying extents of property damage.

History of Occurrences:

Date	Event	Location	Extent
02/06/2012	Structure fire	Route 100	The Stockbridge Fire Department responded to a report of a structure fire at 662 on Route 100 in Stockbridge with smoke filling the building and no flames visible. We found the fire under the under the fire place after taking it all apart at the bottom.
02/02/2012	Structure fire	Gilkey Road	The Stockbridge Fire Department responded to a report of a structure fire on 2264 Gilkey Road in Stockbridge. When we arrived on scene we found the building fully involved on one end.
11/26/2011	House fire	Tweed Lane	The Stockbridge Fire Department responded to a report of a structure fire at 118 Tweed Lane finding a chimney fire that extended to the structure.
10/19/2011	Barn fire	Route 107	The Stockbridge Fire Department responded to a report of a structure fire at 5361 on Route 107 in Stockbridge, finding an old horse barn fully involved.
07/09/2011	House fire	Whitney Road	A fire at a private property destroyed a building, killing 5 German Shepherds and 23 chickens.
02/01/2006	House fire	Mount Hunger Road	The Stockbridge Fire Department responded to 200 Mount Hunger Road in Stockbridge for a report of a structure fire. When we arrived on scene we found the kitchen fully involved.
11/18/2005	Structure fire	Whitney Road	The Stockbridge Fire Department responded to a report of a structure fire at 47 Whitney Road. We found the building burning on the end near the stove pipe.
02/21/2005	Structure fire	Stony Brook Road	The Stockbridge Fire Department responded to a report of a structure fire at 1079 Stony Brook Road. When we got there we found the building fully involved in the back around the chimney.
06/25/2004	House fire	River Road	The Stockbridge Fire Department responded to a report of a structure fire at 127 River Road. We found the basement of the house was burning.

As noted, recognized fire protection problems for the community include the following: development in areas distant from the main roadways, development on class 3 and 4 roads, distance from water sources (rivers, hydrants and/or fire ponds), inaccessibility to fires that may spread from the forest, and inadequate snow removal (for building access). Stockbridge has installed 3 new dry hydrants within town limits in the past year (Olmstead Drive, Herkes, in Gaysville, Lilliesville Brook Bridge, and Stony Brook), and another hydrant that was added to Stockbridge Common in 2009. There are additional areas where dry hydrants could be developed and installed, and a comprehensive survey may prove an effective means of determining this if more sites are needed.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/ Probability
Structural Fire	Town-wide	All housing, municipal buildings, retail/commercial sites.	Depends on the location and extent of the fire.	Varies depending on the location and extent of the fire.	Likely

4. 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 caused by 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, which 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 nearby Waitsfield. A string of storms in March 2001 hit the state, beginning with 15-30 inches on March 5-6th (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 toppled 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 in 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. The Town of Stockbridge was impacted by this ice storm.

Over the past few winters, Stockbridge has received numerous snow storms that have dropped significant amounts of snow over a day or two day period. 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 Stockbridge and in Windsor County.

History of Occurrences:

Date	Event	Location	Extent
03/19/2013	Winter Storm	Windsor County/Region-wide	Moderate snowfall throughout the state, with accumulations between 6-12". Numerous vehicle accidents reported.
02/08/2013-02/09/2013	Winter Storm	Windsor County/Region-wide	Two-part system led to 8-16" of snowfall across Windsor county.
12/29/2012-12/30/2012	Winter Storm	Windsor County/Region-wide	Snowfall in Windsor County ranged from 5-8".
12/26/2012-12/27/2012	Winter Storm	Windsor County/Region-wide	6-12" of snow fell throughout Windsor County, falling at rates of 1-2" per hour at times and some vehicle accidents occurred.
02/05/2011-02/06/2011	Winter Weather	Windsor County/Region-wide	Roughly 4-8" of snow, freezing rain, and sleet fell across Central Vermont, which had a large amount of snow from previous storms. Heavy snow loads caused structural damage. $35k of reported damage in Windsor County.
02/02/2011	Winter Storm	Windsor County/Region-wide	Snow totals across Windsor County ranged from 10-15", with $25k of damage reported.
01/12/2011	Winter Storm	Windsor County/Region-wide	Generally 8 to 15 inches of snow fell across Windsor County with $10k in damage reported.
12/26/2010	Winter Storm	Windsor County/Region-wide	Snowfall totals of 6 to 15 inches with localized higher amounts occurred as well as considerable blowing and drifting of the snow due to north winds of 15 to 25 mph with gusts approaching 40 mph. Numerous vehicle accidents and some isolated to scattered power outages were witnessed, and $15k in damages were reported in the county.
02/23/2010	Winter Storm	Windsor County/Region-wide	Snow accumulations ranging from 6-30" reported throughout Vermont. Nearby towns of Warren and Randolph Center saw 32" and 26", respectively. $1m in property damage was reported for the county.
01/28/2009	Winter Storm	Windsor County/Region-wide	A storm from the West brought accumulations of 8-14" in Vermont. Nearby towns of Braintree and Rochester received 17" and 13", respectively. $10k in damages reported throughout Windsor County, and numerous vehicle accidents were reported.
12/21/2008	Winter Storm	Windsor County/Region-wide	Snow accumulations of 10-18" were reported across eastern Vermont, including 18" reported in nearby Rochester. This storm came on the heels of another storm that happened within 36 hours prior to the storm, causing snow totals altogether in excess of 24" in places and causing vehicle accidents and exhausting snow removal resources. Some CO poisoning injuries were reported, some small farm structures collapsed. Total of $15k in damages reported in the county.
12/11/2008-12/12/2008	Snow Storm	Windsor County/Region-wide	Snow and freezing rain fell across Vermont, ranging from 5-9" of snow with a glazing of ice. This led to hazardous driving conditions, school closures, civic/government closures, power outages, and $250k in damage across Windsor County.

Date	Event	Location	Extent
02/14/2007*	Heavy Snow	Stockbridge, Windsor County/Region-wide	Nor'easter brought 22" of snow to Springfield, with snowfall rates of 2-4" per hour reported along with brisk winds of 15-25 mph, causing a great deal of drifting and whiteout conditions. Windchills of -10F or colder reported. A total of $250k in county-wide damage (many roof collapses in the region, livestock killed in some instances).
12/06/2003-12/7/2013	Winter Storm	Windsor County/Region-wide	A snow storm traveling up the coast brought 12-20" of snow to Windsor County, and caused $20k in damages.
04/04/2003-04/05/2003	Winter Storm	Windsor County/Region-wide	10-20" of snowfall reported in Windsor County, causing traffic accidents, road closures, and $40k of damage throughout the county.
01/04/2003	Winter Storm	Windsor County/Region-wide	A storm system brought between 10-20" of snowfall to Windsor County, and caused power outages and $20k of reported damage.
01/07/2002	Heavy Snow	Windsor County/Region-wide	Snow fall of from 6-15" reported throughout the region. Many power outages and school closures region-wide, along with a total of $30k in damage.
03/30/2001-03/31/2001	Winter Storm	Windsor County/Region-wide	10-20" of snow fell throughout Windsor County. The storm caused power outages and slippery roads, and led to $50k in damage county-wide. Closely followed a storm a week prior with 7-25" of snow and $50k in damage for the county.
03/05/2001-03/06/2001 (EM-3167)	Winter Storm	Windsor County/Region-wide	20-30" of snow fell throughout the region, causing numerous school closures and Town Meeting Day postponements. $100k of reported damage in Windsor County.
02/05/2001-02/06/2001	Winter Storm	Windsor County/Region-wide	8-21" of snow fell in Windsor County, causing a number of car accidents and a total of $75k in reported damage.
12/20/1999-12/21/1999	Winter Weather	Windsor County/Region-wide	Freezing rain hit Vermont, particularly near the Green Mountains. Caused numerous accidents due to icy road conditions, and led to $50k in damage in the county.
01/06/1998—01/16/1998 (DR-1201)	Ice Storm	Windsor County/Region-wide	Ice accumulations in the region averaged ¾" or less, and damaged tens of thousands of trees. Power lines were downed from the weight of the ice, and vehicular travel was seriously disrupted. Falling tree limbs and debris also led to accidents. $80k in damage reported in the county.
01/19/1997	Cold/Wind Chill	Windsor County/Region-wide	An arctic air mass brought bitterly cold temps to the region, including Windsor County. Nearby Bethel reported a low of -32F, not accounting for wind-chill.

The Town of Stockbridge is no stranger to winter weather and the hazards that it brings. Depending on the event, though especially with heavy, wet snow or ice, electricity may be knocked out for a few hours or days. The utility company currently serving the Town of Stockbridge, Green Mountain Power, has followed a regular tree-trimming schedule. Stockbridge 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 its emergency shelter.

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 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.

In general, winter weather is most hazardous to travelers. Icy and snow-covered roads present multiple examples of dangerous driving conditions and situations. In Stockbridge, 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. Despite this, 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	Observed 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

5. Flash Flood/Flood/Fluvial Erosion

Flooding is one of the worst threats to Stockbridge's residents and infrastructure. Past instances of flooding in Stockbridge 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

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**.

build-up of ice or debris, which can contribute to the failure of important infrastructure (such as culverts, bridges, and dams).

The worst flood disaster to hit the Town of Stockbridge, 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. Eighty-four Vermonters, including the Lieutenant Governor, were killed. The flooding in the White River valley was particularly violent, with an estimated 120,000 to 140,000 cubic feet/second (cfs) flowing out of the White River at West Hartford, Vermont. Like many towns in the region, the Town of Stockbridge received heavy precipitation, seeing roughly 7-8 inches of rainfall over the storm period.

A more recent flooding event 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, as well as hundreds of 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 a 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 Stockbridge suffered major damage to property and infrastructure during Tropical Storm Irene, although no lives were lost. It is estimated that Tropical Storm Irene dropped 5-7 inches of rain over the Town of Stockbridge in a very short span of time, some of the highest precipitation totals in Windsor County (which averaged 4-7 inches over its land area). Local reports following the event state that the total rainfall that hit Stockbridge was nearer to 11.8 inches overall. It is thought that the flooding that occurred as a result of the storm was close to being or was a full-fledged 500-year flood.

Virtually all of Stockbridge's roads were damaged by the storm to varying extents, including parts of: Route 100, Route 107, Stony Brook, River Road, Lilliesville Brook, Whitcomb Hill, and Davis Hill. The county-wide damage for Windsor County totaled over $32.5 million. Following the flood damage, the State of Vermont and FEMA have been coordinating on the home buy-out process across the state. There are a total of nineteen buyouts in Stockbridge alone, located on the following roads: Schaff Haus (10), Lucerne (1), Tweed (1), River Road (1), VT 100 (3), Fletcher Brook (1), Bridge Street (1) and Canton Drive (1).

Unfortunately, flooding is very common across the region, with many events impacting the Town of Stockbridge specifically. Flooding is one of the worst threats to Stockbridge's residents and infrastructure. The following list indicates the history of occurrence with regard to this hazard in Windsor County (given the small population of Stockbridge, 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
06/25-07/11/2013 (DR-4140)	Severe Storms and Flooding	County-wide	Severe storms caused flooding throughout the region, causing damage to some infrastructure and facilities.
08/28/2011 (DR-4022, TS Irene)*	Tropical Storm	Stockbridge, County-wide	Widespread flooding hit the region, striking Stockbridge particularly badly. Homes, businesses, and roads were flooded throughout Windsor County. Stockbridge saw 5-7" of rainfall, which wrecked homes, roads, bridges, and culverts. As of early 2014, 19 landowners have had to seek buyouts for their properties. 4,000' of roadway on Rt. 107 between Stockbridge was completely destroyed during the storm. $5,255,120.69 07 in damage total for Pittsfield according to FEMA's Public Assistance database (captures at least 70% of total damage).
04/27/2011	Flood	County-wide	Heavy rains, snowmelt from an above-normal snowpack, and high temps caused significant flooding in the region.
10/01/2010	Flood	County-wide	Heavy rains from the remnants of TS Nicole hit Vermont, dumping multiple inches of rain in the White River Valley, and washing out local roads (including Rt. 100 in Rochester).
07/21-08/12/2008 (DR-1790)	Flood	County-wide	Showers and thunderstorms produced significant rainfall across the region, causing sever flash flooding in places. Flood waters originating in Addison County traveled down the White River through Rochester and Stockbridge, causing portions of Route 100 to flood.
07/09-7/11/2007 (DR-1715)*	Severe Storms and Flooding	Stockbridge, County-wide	Tropical-like showers and thunderstorms caused heavy localized flooding. Rainfall exceeded 3" within a 2 hour time frame, with some areas getting nearer to 6". Many washed out roads, flooded basements, and homes damaged or destroyed. Lilliesville Road, River Road, and Routes 100 and 107 were washed out. Also, significant structural and flood damage to seasonal camps in the area off of Lilliesville Road. Flooding completely destroyed Lilliesville Brook Bridge on River Road. Total of $250k in damage to the town.
04/15-04/21/2007 (DR-1698)	Severe Storms and Flooding	County-wide	Severe storms caused flooding throughout the region, causing damage to some infrastructure and facilities.
05/14/2006	Flood	County-wide	Storms brought 3-6" of rain to Windsor County, causing flooding and minor washouts on several roads in the region. The White River experienced bankfull conditions and minor field flooding in places.
01/18/2006	Flood	County-wide	Rainfall of 1.5-2.5" hit the region, increasing run-off into area watersheds. Some areas experienced field flooding and ponding on roadways. $3k in county-wide property damage reported.
10/07-10/09/2005	Flood	County-wide	Heavy rains resulted in minor flooding throughout Windsor County, and caused $20k in property damage.
10/29/2003	Flood	County-wide	Heavy rains fell on already-heavily saturated soils, and streams and rivers, including the White River, rose rapidly. Low land and field flooding occurred in the watershed.
07/21-08/18/2003	Severe Storms and Flooding	County-wide	Severe storms caused flooding throughout the region, causing damage to some infrastructure and facilities.

Date	Event	Location	Extent
04/13-04/14/2002	Flood	County-wide	Widespread rainfall totaled 1-3" across the region, and was compounded by snowmelt. The White River and its branches flooded in areas, and $50k in damages was reported for Windsor County.
12/17/2000	Flash Flood	County-wide	Small streams overflowed their banks, causing some road and low land flooding. $5k in damage in the county.
07/31/2000	Flash Flood	County-wide	Heavy rainfall cased many small rivers to reach or exceed bankfull throughout the county. $10k in damage reported.
07/14-07/18/2000 (DR-1336)	Flash Flood	County-wide	Showers and thunderstorms resulted in heavy rainfall, particularly in mountainous areas. Led to $500k in property damage in the county.
04/04/2000	Flash Flood	County-wide	Steady rains and mild temps that caused snowpack melt led to stream and river flooding in the region. $10k in damage reported county-wide.
03/28/2000	Flash Flood	County-wide	Steady rains and melting snow led to rising water levels in streams and rivers throughout the county, causing $5k in county-wide damage.
09/16-09/21/1999 (DR-1307)	Severe Storms and Flooding	County-wide	TS Floyd brought heavy rains, high winds, and flooding to the region, causing extensive damage to public property.
07/13/1996	Flood	County-wide	Region was struck by the remnants of TS Bertha, causing heavy rainfall throughout the region and washing out numerous roads. $10k in damage reported in the county.
05/11-05/12/1996	Flood	County-wide	Rain and snowmelt led to many rivers swelling and minor field flooding in places. $5k in damage reported in the county.
01/19-01/20/1996	Flood	County-wide	A deadly storm caused strong winds and flooding throughout the state. Many roads washed out, numerous power outages were reported, and $900k in damage occurred in Windsor County.
06/28-06/30/1973 (DR-397)	Flooding	County-wide	Rainfall as much as 6 inches in 24 hours in some locations. State declared disaster area. Deaths, 3; damage, $64 million.
11/02-11/04/1927 ("Flood of 1927")	Flooding	County-wide	Considered to be on of VT's most devastating events, the flood took our 1285 bridges, miles of roads and railways, and countless homes and buildings. 84 people were killed, including Lt. Gov. S. Hollister Jackson. Rainfall totaled 4-9" statewide, following a month with 150% the normal amount of rain. Stockbridge and the nearby vicinity saw between 7-8" of rainfall during the storm.

The Stockbridge does not have standalone flood hazard regulations. However, the Town's Zoning Bylaws severely restrict development in flood-prone areas within the designated Special Flood Hazard Area.

There are 21 residential (18 single family dwellings and 3 mobile homes) and 7 commercial/industrial/public structures in the 500-year floodplain, which would equal $5,808,355 if all properties were damaged/destroyed in a severe flooding event. There are two public water supply wells located in the floodplain, which are classed as critical facilities for the Town. The flooding that occurred as a result of Tropical Storm Irene is considered to be greater than a 100-year flood event, and likely closer to a 500-year flood.

Across Vermont, most child and elder care facilities are not registered with the State. Most child day care is private in-home care in Stockbridge, but there are also four licensed or registered home facilities. There are no elder care facilities in the Town of Stockbridge. Finally, low income housing is not registered with the State, and there are currently no mobile home parks located in Stockbridge that are registered with the state.

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 Maps), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be extremely 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/mountainside undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently. There are six residential structures, two commercial structures, and eighteen camp sites located in the fluvial erosion hazard zone.

Stockbridge maintains an up-to-date list of culverts and culvert condition, and has engaged in culvert upgrading since the 2009 Stockbridge Annex was drafted. The process of upgrading culverts is currently in process. No development projects are planned in Stockbridge in areas that would be vulnerable to flooding. There are three repetitive loss properties in the Town of Stockbridge on FEMA's NFIP list.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/ Probability
Flooding	All roadways and properties adjacent to the waterways.	Culverts, bridges, road infrastructure. There are 21 residential (18 single family dwellings and 3 mobile homes) and 7 commercial/industrial/public structures in the 500-year floodplain.	Tropical Storm Irene-4-7" across county (5-7" in Stockbridge).	From TS Irene: $5,255,120.69 for Stockbridge from FEMA's Public Assistance database (captures at least 70% of total damage).	Likely

VI. Mitigation

A. Excerpted Town Plan Goals & Objectives Supporting Local Hazard Mitigation

- To promote development within the Town of Stockbridge consistent with the ability of the Town to provide services (p. 3).
- To promote development of Stockbridge in such a way as will protect and enhance residential areas, and not cause undue concentrations of population, buildings, traffic, congestion, or loss of peace, quiet, and privacy (p. 3).
- To protect agricultural and forest lands, so as to maintain and enhance their productive capabilities (p. 3).
- To maintain and enhance the freedom, rights, privileges, and responsibilities of all citizens of Stockbridge (p. 3).
- To prevent the development of land clearly incapable of supporting, from a physical standpoint, the type or intensity of land use being proposed (p. 3).
- To encourage public investments in governmental and public utility facilities, services, and lands which support existing and future needs within or near the villages, or other designated and planned growth areas (p. 17).
- To promote effective, efficient and accessible public services, including schools, health care facilities and libraries (p. 17).
- To identify and encourage land use development practices that avoid or mitigate adverse impacts on significant wetlands (p. 25).
- To minimize and prevent loss of life and property, the disruption of commerce, the impairment of the tax base and the extraordinary public expenditure and demand for public service that result from flooding (p. 26).
- To ensure that if new development is to be undertaken in the flood hazard areas that it be designed and constructed in a manner that minimizes or eliminates the potential for flood damage (p. 26).
- To maintain wise use of agricultural land and open space in flood-prone areas (p. 26).
- To consider surface water impacts and effects related to proposed or existing uses of land (p. 27).
- Encourage the conservation, wise use and management of the town's agricultural and forestry resources, to maintain its environmental integrity, and to protect its unique and fragile natural features (p. 34).
- To maintain a transportation system that is safe, efficient and complements the other goals and policies of this Plan (p. 40).
- To advocate against public utility upgrades or extensions unless the public is clearly benefited thereby and where it is determined not to compromise the land use goals and policies for this Area (p. 49).
- To ensure the protection and management of upland watersheds comprising the Area and that they remain in their pristine or natural state (p. 49).

The Stockbridge Town Plan was updated and adopted on 07/01/2010, and has a 5 year lifespan.

B. 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's 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, Stockbridge'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 Stockbridge understands that, in order to apply for FEMA funding for mitigation projects, a project must meet more formal FEMA benefit cost criteria. The Town must have a FEMA-approved Hazard Mitigation Plan as well.

The following strategies will be incorporated into the Town of Stockbridge's long-term land use and development planning documents. In addition, the Town will review and incorporate elements of this Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/ fluvial erosion hazards (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.

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
All Hazards	*Ensure that Stockbridge's Local Emergency Operations Plan (LEOP) is kept up-to-date and identifies vulnerable areas and references this Plan.*	Emergency Management Director/ Coordinator	High	Local Resources; TRORC	Annually
	Consistently document infrastructure damage after weather events.	Road Commissioner	High	Local Resources	On-going
	Complete designation of the proposed Red Cross Shelter at the Stockbridge School.	Emergency Management Director/ Coordinator	High	Local Resources; Red Cross	1 year
Hazardous Material Spill	*Ensure that all emergency response and management personnel continue to receive HAZMAT Awareness training at a minimum.*	Fire Chief	Low	Local Resources; Vermont League of Cities &Towns; State HAZMAT team	1 year
	Acquire to help contain small spills when they happen (booms, absorbent materials, etc.).	Fire Chief	Low	Local Resources; Vermont League of Cities & Towns	2-3 years
Structural Fire	*Ensure that some fire department personnel maintain their Firefighter certifications.*	Fire Chief	Low	Local Resources	On-going
Structure Fire/ Wildfire	*Complete a comprehensive survey of potential dry hydrant sites to determine the need for additional sites and potential location, and install dry hydrants.*	Fire Chief	High	Local Resources; Vermont Rural Fire Protection Task Force grants	On-going
Wildfire	*Review Stockbridge's Community Wildfire Protection Plan.*	Fire Department	Medium	Local Resources	Annually
Extreme Cold/Snow/ Ice Storm	*Identify populations that are vulnerable to extreme cold and make a plan to assist them, if necessary, in the event that it occurs.*	Emergency Management Director/ Coordinator	High	Local Resources	Annually
	Plan for, budget and maintain roads for safe winter travel.	Selectboard in coordination with the Road Commissioner	High	Local Resources	Annually

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
Flash Flood/ Flood/ Fluvial Erosion	*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; Better Backroads grants	On-going
	As part of the Town Plan updates, consider revising and strengthening the Town's Flood Hazard Bylaw.	Planning Commission	Low	Local Resources; TRORC; Municipal Planning Grants; VT ANR's River Management Section	4-5 years
	Proceed with and close on the following home- buyout properties: *3 on Schaff Haus, 1 on Fletcher Brook, 1 on Bridge Street.*	Selectboard	High	HMGP; CBDG; TRORC; local resources	1-3 years
	Investigate areas of landslide risk.	Selectboard in coordination with the Road Commissioner	Medium	State Geologist	2-3 years
	Investigate the rehabilitation or replacement of the Gaysville Bridge.	Selectboard in coordination with the Road Commissioner	High	Local Resources; TRORC; State Resources	2-3 years
	Replace/update culvert on Music Mountain Road (located at N43.80608 and W072.73809).	Selectboard in coordination with the Road Commissioner	Medium	Local Resources; State Resources (Better Backroads grants, Structures grants); FEMA HMGP and PDM-C grants	2-4 years
	Replace/upgrade culvert on Blackmer Boulevard (located at N43.77695 and W072.75235).	Selectboard in coordination with the Road Commissioner	Medium	Local Resources; State Resources (Better Backroads grants, Structures grants); FEMA HMGP and PDM-C grants	2-4 years
	Replace/upgrade multi-plate culvert on Stony Brook Road, at the intersection of Davis Hill and Stony Brook (located at N43.72726 and W072.72113)	Selectboard in coordination with the Road Commissioner	Medium	Local Resources; State Resources (Better Backroads grants, Structures grants); FEMA HMGP and PDM-C grants	2-4 years

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
Flash Flood/ Flood/ Fluvial Erosion	Replace/upgrade multi-plate culvert on Fletcher Brook Road, intersecting with Taggart Hill Brook (located at N43.73477 and W072.73591).	Selectboard in coordination with the Road Commissioner	Medium	Local Resources; State Resources (Better Backroads grants, Structures grants); FEMA HMGP and PDM-C grants	2-4 years
	Replace/upgrade multi-late culvert on Labadie Road, which intersects with Taggart Hill Brook (located at N43.73542 and W072.74009).	Selectboard in coordination with the Road Commissioner	Medium	Local Resources; State Resources (Better Backroads grants, Structures grants); FEMA HMGP and PDM-C grants	2-4 years

Certificate of Adoption

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

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

WHEREAS, a duly-noticed public meeting was held by the Town of Stockbridge Select Board on _____ __, 2013 to formally adopt the Stockbridge Local Hazard Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Stockbridge Select Board adopts the Stockbridge 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 metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

Appendix B: Critical Stream Crossings

Critical crossings group one 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.

RDFLNAME	STRUCT_NUM	CATEGORY	X_COORD	Y_COORD	STR_TYPE	STR_MAT	CUL_WIDTH	CUL_HEIGHT	CUL_LEN
BRIDGE ST	101419003514191	B	-72.7005	43.7785		0	0	0	0
S HILL RD	101419003214191	B	-72.7686	43.7745		0	0	0	0
BLACKMER BLVD	101419000614191	B	-72.7231	43.7597		0	0	0	0
STONY BROOK RD	101419000514191	B	-72.7073	43.7605		0	0	0	0
RANNEY RD	101419002814191	B	-72.717	43.7506		0	0	0	0
FLETCHER BROOK RD	101419003314191	B	-72.7233	43.7373		0	0	0	0
DRISCOLLS RD	101419003014191	B	-72.7222	43.7202		0	0	0	0
STONY BROOK RD	101419002414191	B	-72.7213	43.7131		0	0	0	0
STONY BROOK RD	101419002514191	B	-72.7208	43.7123		0	0	0	0
STONY BROOK RD	101419002614191	B	-72.7209	43.7066		0	0	0	0
RIVER RD		C	-72.6796	43.7923	Round	Steel Corrugated	36	36	26
STOCKBRIDGE COMMON		C	-72.7573	43.7878	Round	Steel Corrugated	72	72	72
BLANCHARD RD		C	-72.7349	43.7357		0	0	0	0
STONY BROOK RD		C	-72.7211	43.7272		0	72	72	50

Critical crossings group two includes significantly undersized structures, usually culverts, 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	OWNER_FIPS	CATEGORY	AOTCLASS	X_COORD	Y_COORD	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	OpennesssR	ChannelWid
WHITCOMB HILL RD	Y	27095	C	0	-72.7079	43.804	36	36	31	0.28	3
STONY BROOK RD	Y	27095	C	0	-72.7068	43.7594	48	48	38	0.430244	9
STONY BROOK RD	Y	27095	C	0	-72.7113	43.7532	48	48	35	0.457143	11

Attachments

Attachment A: Map of Stockbridge