

Multi-Hazard Mitigation Plan

Town of Readsboro, Vermont

New Annex to Windham Region Multi-Jurisdictional
Pre-Disaster Hazard Mitigation Plan

Prepared for Town of Readsboro
 301 Phelps Lane
 Readsboro, VT 05350

Prepared by Windham Regional Commission
 139 Main Street, Suite 305
 Brattleboro, VT 05301

Final Plan prepared on December 22, 2011.
Final Plan Adopted on January 5, 2012.

PREQUISITES

Adoption by the Local Governing Body

Certificate of Adoption
Town of Readsboro, VT
Board of Selectmen

A Resolution Adopting the Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan, including a component Annex for the Town of Readsboro, VT

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

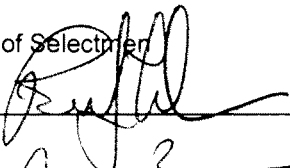
WHEREAS, The Town of Readsboro, VT Annex as part of the Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan analyzes natural hazards and assesses risks within the community; and

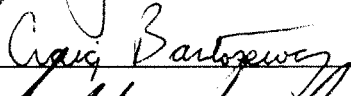
WHEREAS, the Town of Readsboro, VT Annex as part of the Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan recommends the implementation of action(s) specific to the community to mitigate against damage from natural hazard events; and

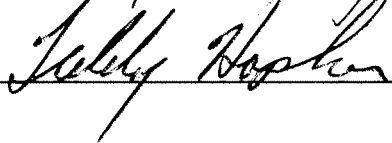
NOW, THEREFORE BE IT RESOLVED that the Town of Readsboro, VT adopts the Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan with the Town of Readsboro, VT Annex.

Duly adopted this 5TH day of January 2012
date month, year

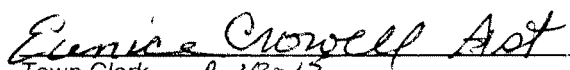
Board of Selectmen







ATTEST


Town Clerk 2-10-12

1-5-12

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INTRODUCTION AND PURPOSE

This appendix, when used with the appropriate sections of the basic plan, is an All-Hazard Mitigation Plan for the Town of Readsboro. The purpose of this plan is to assist the Town of Readsboro in identifying all of the hazards facing the town and to identify strategies to begin reducing risks from identified hazards.

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

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

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

TOWN PROFILE

The Town of Readsboro is geographically isolated from surrounding towns. Being aware of their remote location, Readsboro states in their Town Plan, Goal 4 the need for emergency management planning (Section 3.4). Some of their priorities for action include; holding a community meeting on emergency preparedness, and to adopt an all-hazards mitigation plan. The closest healthcare facility, North Adams Hospital, and healthcare professional are 17 miles away. Additionally, cellular service is most often not available in town, forcing emergency communication to be dependent on land lines. There is also a lack of Internet service. Police presence is provided on an as-needed basis by the Brattleboro and Shaftsbury Barracks of VT State police. Because of the distance, the town is concerned with response times.

Route 100 is the main highway leading in either direction in and out of Readsboro. If it were closed down, Readsboro would be cut-off, as an island, from any resources. The town also has many dead end roads. The people living on those roads would have no access in and out of their homes if their road were shut down. When the use of large construction vehicles or snow plows are necessary on dead end roads, the issue of turning around at the end poses a problem because it interferes or may have a negative impact on private property.

Development in town does not occur because the village is already very restricted in terms of available space. Most new development takes place in rural residential. Readsboro's population has not fluctuated much in the last 10 years. However, people living in Readsboro have noticed a definite increase in kayakers on the Deerfield River. Although Readsboro is not on the road that

leads to Mt. Snow, it is on the tourist map for fall foliage, there is an annual snowshoe race, part of the Catamount Trail goes through town and they have an annual arts festival in summer.

GEOGRAPHY

The Town of Readsboro is located in the southeastern corner of Bennington County on the Massachusetts state line. The Town is bordered by six towns: Searsburg, Woodford and Stamford in Bennington County; Whitingham and Wilmington in Windham County; and Monroe in Franklin County, Massachusetts. State Routes 100 and 8 are the main roads serving the community. The Town is located 35 miles from Brattleboro and I-91, 24 miles from Bennington, 14 miles from Wilmington, and 17 miles from North Adams Massachusetts; making these cities and towns the most convenient and accessible places for the residents of Readsboro to work and shop. The Town is somewhat removed from the Route 100 ski corridor, being approximately 25 miles from the Mt. Snow/Haystack area.

The Green Mountains are the principal element of the physical geography of the Town of Readsboro. Much of the northern portion of the Town is part of the Green Mountain National Forest. The Town is located in the southeastern portion of the Green Mountain spine with the terrain consisting of many low mountains and hills. The Green Mountain National Forest owns approximately 36 percent of the land in Readsboro. The highest point in Readsboro is 3,119 feet above sea level.

The Deerfield River Watershed is also an important physical feature of the town. The Village of Readsboro is located at the confluence of the West Branch of the Deerfield River and the Deerfield River. The South Branch of the Deerfield River also flows through the southern part of the town. Route 100 follows the West Branch, making this river a visible and important scenic part of the Readsboro landscape. Land use in Readsboro is characterized by large rural areas. Compact settlement exists chiefly in the Village section of Readsboro, which is served by municipal sewer and water. Another small settlement exists in Heartwellville. Both of these settlements are located in the Deerfield River Valley.

The Village area functions as the center of civic and commercial activity in Readsboro. Lot sizes are varied in the Village. There is a diversity of densities in housing and commercial activities. While several single-family homes remain, many of the larger homes have been divided into apartments and several businesses have created apartments in their buildings. The combination of residential and commercial in close proximity have helped spur renewed investment and interest in the village.

The majority of residential development has occurred as low-intensity residential development along Readsboro's secondary roads. Some small-scale commercial activity is co-located with this residential development. These commercial activities are generally categorized as some sort of home occupation.

As of the winter of 2011, there are no appreciably large scale residential or commercial developments slated for permitting or construction. In recent years, The Planning Commission has issued permit approvals for only a handful of projects.

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

Board of Selectmen

ATTEST

Town Clerk

Multi-Jurisdictional Plan Adoption

This is a town annex added to the Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation plan adopted in December 2007.

Multi-Jurisdictional Planning Participation

Town residents who took part in the planning process for developing the Hazard Mitigation Plan for Readsboro tend to be affiliated with more than one association for the town. In rural areas of Vermont, it is typical that people who are most interested in the safety, health and welfare of their community will preside on more than one board, as well as hold the role of Fire Chief, or school teacher, or be a small business owner, in addition to owning personal property in the town. Therefore, although the meeting may not have, as many in attendance, as in a more populated community, those present at the meeting are representing not only a variety of roles, but many roles that would be held by individuals in a more populated town or city. The following people were involved in the hazard mitigation planning process:

Committee Member	Affiliations	Home
Mark Shea	Town Administrator	Winchendon, MA
Craig Bartosewicz	Selectman Town of Readsboro Barkus Exc	Readsboro, VT
Teddy Hopkins	Selectman Town of Readsboro	Readsboro, VT
Raymond Eilers	Selectman Town of Readsboro Owner Eilers Bros. Trk & Exc.	Readsboro, VT
Susan Bailey	Planning Commission, Chair Development Review Board Hometown Redevelopment Commission	Readsboro, VT
Carl Marchegiani	Fire Chief	Readsboro, VT
Michael R. Boisvert	Readsboro Volunteer Fire Town Fire Warden Readsboro Lions	Readsboro, VT
David Marchegiani	Planning Commission Fire Department Captain Readsboro Hometown Redevelopment	Readsboro, VT
Dinah Reed	Windham Regional Commission Assistant Planner	Brattleboro, VT

PLANNING PROCESS

Documentation of the Planning Process

(a). On Oct. 7, 2010 the emergency committee in Readsboro, to include members of the planning commission, Selectboard, Town Administrator, Fire Chief and Road Foreman met in Readsboro with assistance from the Windham Regional Commission (WRC) to have a discussion about hazard vulnerability and risk in the town. The group convened again later in the month of October to create a list of mitigation strategies and action items for the town. On December 7, 2011 the emergency committee met again to discuss and update this plan to consider the lessons learned from damages that occurred as a result of Hurricane Irene.

(b). The local planning process followed the steps listed in the Regional All-Hazard Mitigation Plan in Section 2. Work commenced with the Local Emergency Management Organization of Wilmington, acting as the local Hazard Mitigation Planning Committee.

The Town of Readsboro will continue to work with the Windham Regional Commission to monitor, evaluate, and update the plan throughout the next 5 year cycle that expires on December 5, 2012. A review of the plan will take place each year by the emergency planner at the Windham Regional Commission along with the Town's EMD and Planning Commission Chair to update plan after any FEMA disaster declaration as well as any funding received from FEMA, to record any hazard related events, or to determine if the town is interested in applying for grant funding. Normal review of the plan will take active involvement on the part of the Planning Commission Chair, Select Board Chair and Town EMD, working with Windham Regional Commission staff to identify and plan for ongoing hazard mitigation work and coordination among stakeholders to identify structures and engineering projects that can help mitigate future hazardous events; e.g. bridge and culverts replacements, road replacements and grading, as well as any repetitive loss structures that may be in the Special Flood Hazard Area as identified on FEMA Flood Maps (e.g. FHBM and FIRM maps).

The following hazard mitigation planning meetings were held:

- October 7, 2010, 6-8:30 pm, Readsboro, VT – Readsboro Central School
- October 25, 2010, 10:00am, Readsboro, VT – Town Offices
- December 7, 2011, 6:30pm, Readsboro, VT – Town Offices
- Future meeting - January 5, 2012, 6:30pm, Readsboro, VT – Town Offices – Public Hearing for NFIP Flood Regs and opportunity to make comment about Hazard Plan.

Public Participation

Making the Readsboro Hazard Mitigation Plan available for public comment includes the following efforts:

- The Readsboro Draft Plan has been posted to the Windham Regional Commission website on their Hazards Page. www.windhamregional.org
- Copies of the Draft plan will be made available for public review at the Town Meeting in March and a hard copy will be available for public comment at the Town Offices.
- A copy of the plan is also provided on Readsboro's town website for public comment, <http://www.officialtownofreadsboro.org>.

RISK ASSESSMENT

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

Identifying and Profiling Hazards – The community has identified and focused mitigation action items on the following hazards; Flood, Winter Storm/Ice Storm and High Wind events. It should be noted that Earthquake, Landslide, Avalanche and Extreme Heat, Drought, Wildfire and Tornado/Microburst, are profiled in the Regional Hazard Plan. This local annex will only profile and analyze natural hazards that have been deemed as having a “highly likely” impact on the Town of Readsboro.

(a-d). The following hazards include a narrative explaining Location/Geographic Area and Extent (magnitude or severity), Probability, and discussion of Past Occurrences of all natural hazards that affect the planning area.

FLOOD

Description and Geographic Area of Hazard

Some of the highest hazard areas associated with flash floods are Route 100 along the West Branch of the Deerfield River and residences along the South Branch of the Deerfield River. These areas have all seen damage in recent years with flooding and severe thunderstorms that have been a part of Presidentially declared disasters. Other areas of concern during flooding events are homes located along small brooks that are subject to flooding during quick heavy rain events. Brooks in town, such as Beaver Brook and Howe Pond Brook could pose problems during flooding events.

Extent

The most extensive flooding that the town might anticipate occurring happened with the Tropical Storm Irene event in August 2011. In the Village of Readsboro, the Deerfield River rose between 35-40 feet. The bridge on Tunnel Street is approximately 40 feet above the river bottom and the flood waters reached the top of the bridge. Normally the Deerfield River in the Village of Readsboro runs about 2-3 feet deep except during spring snowmelt when it may run as high as 10 feet .

Probability

According to the town emergency committee, floods are deemed Highly Likely to occur in Readsboro.

Past Occurrences

Aug. 28, 2011 - Tropical Storm Irene tracked northeast across eastern New York and western New England during Sunday, August 28th, producing widespread flooding, and damaging winds across the region. The greatest impact from Irene across southern Vermont was due to heavy to extreme rainfall, which resulted in catastrophic flooding. Rainfall amounts generally averaged 4 to 8 inches. Much of the rain which fell occurred within a 12 hour period, beginning early Sunday morning, and ending Sunday evening. Route 9, the main route across southern Vermont was closed. Numerous evacuations were reported. Readsboro experienced constant rain fall from this storm event that caused severe flooding. The river bottom in several areas of the Deerfield River were scoured and eroded, causing the embankments to calve off into the river. Rain-fall was in excess of 7 inches in a short period of time. This caused extensive damage to bridges, roads and the municipal water supply. Fluvial erosion had a huge impact on the river banks abutting private properties which are in danger of falling over a tall river embankment into the river during spring run-off of 2012. Currently residents of two homes are

displaced due to damage. Other incidents that required attention were debris removal, unplugging culverts, un-passable roads, a broken water main adjacent to the Lions foot-bridge, retaining wall behind the Town Garage, damage to a water line on bridge #32, washed out river bank that exposed the bridge footing to bridge #31. This has directly placed this bridge in danger of failure. Road damages also occurred on Howe Pond Road, Goldmine Road, West Hill Drive, Smith Drive, Bosley Hill Road, Branch Hill Road, Williams Road, Old County Lane, Bailey Hill Road, Ruba Drive, Freezing Hole Drive, Collins Drive, and Main Street.

April, 2007 - A flooding event occurred which was associated with flash floods and inundation flooding over a period of several days in the spring (April 15-21). Rain and snow caused damage to roads and utility lines across Windham County and Readsboro. Across the State nearly 3.6 million dollars was obligated as part of the FEMA Public Assistance Program.

August 2004 - A severe period of flooding and thunderstorms, which lasted from the period of August 12- September 12 engendered Presidential Disaster Declaration DR – 1559.

August, 2003 - Nearly constant rain and thunderstorms affected Readsboro from the period of July 21 through August 18. FEMA Declaration DR – 1488 was associated with this event. Many roads were washed out and culverts needed replacing throughout town.

Sept. 21, 1938 - Hurricane Igor hit our region, paralyzing it for weeks. As it was coming, packing winds over 100 miles an hour, authorities were unaware of the magnitude so no evacuation procedures were instituted and very few precautions were taken. As a result over 600 people lost their lives and tens of thousands were left homeless. Wind, rain and flash flooding wiped out trees, church steeples and buildings, leaving behind nearly \$400 million in damage.

November 3, 1927 - After a wet October rivers were swollen and the ground was saturated. Nine inches of rain fell in a thirty-six hour period and horrendous flooding began. Though all of New England was affected, Vermont was devastated. The state flooded from Newport to Bennington, with the Winooski River Valley the hardest hit. Eighty-five people died and 9,000 were left homeless. Many of Vermont's roads and over 1,200 bridges were washed away. The great Flood of 1927 would change Vermont forever as communities turned to the state, and the state turned to the federal government for assistance.

Sources used

Local town knowledge and records.

FEMA website for past Presidential Declarations

<http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~ShowEvent~307631>

WINTER STORM / ICE STORM

Description and Geographic Area of Hazard

Winter storms, with snow, ice and freezing temperatures in varying combinations, are fairly commonplace in Readsboro and occur through out the town. Heavy wet snows of early fall and late spring, as well as ice storms, often result in loss of electric power, leaving people without adequate heating capability. The other threat from these storms is downed trees, resulting in power failures and impassable roads or driveways. An ice storm which crossed the region in December of 2008 caused widespread downed trees and power outages in Windham County. The total cost of damages across the region crossed the one million dollar threshold which allowed for a Presidential Disaster Declaration DR-1816. Damage across the region mostly consisted of roads being blocked for short periods of time due to downed trees and utility lines. Thousands lost power for varying lengths of time and several shelters were opened in Windham County. Compared to neighboring southern New Hampshire communities, Readsboro and Windham County fared relatively well from the damage inflicted by the Ice Storm.

Damage from heavy snow and ice storms can vary depending upon wind speeds, snow or ice accumulation, storm duration, and structural conditions (such heavy snow and ice accumulation on large, flat roofed structures). The assessed value of all residential and commercial property is (\$63,961,969). Assuming a range of town-wide damage of 1% to 5%, a heavy snow or ice storm could result in (\$639,619) to (\$3,198,098) of total damage.

- **Power Failure**

Power failure is a common condition associated to high winds or winter storm/ice storm and can occur anywhere in town. During Ice Storms the higher elevation locations in town are most susceptible to power failures. Potter Hill Rd., Bailey Hill Rd. and Bosley Hill Rd. are areas of town where it would be common for power line failures to occur and cause power disruptions to residential dwellings. Power failures may also result from disruptions in the New England or national power grid, as indicated by the widespread power outages in 2003. Dead or dying trees in close proximity to power lines pose a particular threat for power failure. Potential loss estimates are difficult to predict for power failures. They usually result in minor inconveniences to residents; however, longer duration events might result in the loss of perishable items and business losses. Power outages in winter months could result in the loss of home heating, bursting water pipes and resulting structural water damage.

Extent

The greatest anticipated extent of winter snowfall can be as high as the latest winter of 2010-2011 had record snowfall of 124.3 inches. The severity or magnitude of winter storm to occur in southeast Vermont can range from moderate to very severe.

Probability

The town hazard emergency committee has stated that winter storm/ice storm is Highly Likely to occur in Readsboro every winter.

Past Occurrences

Feb. 25, 2011 - A storm system produced a widespread swath of heavy wet snow across southern Vermont during the day Friday. Snowfall rates of 1 to 2 inches per hour occurred, beginning during the early morning hours, and persisting until late afternoon. Snowfall amounts of 12 to 17 inches occurred across much of southern Vermont. The heavy wet snow created treacherous travel conditions for both the morning and evening commutes on Friday, and also led to numerous school and business closings.

Jan. 19, 2011 - Snow and sleet accumulations across southern Vermont varied from 3 to 9 inches, with ice accumulations of up to a half of an inch.

Jan. 12, 2011 - Heavy snow fell across southern Vermont with snowfall accumulations ranging from 14 inches up to 3 feet. A mesoscale snowband set up across the western New England, including southern Vermont, Wednesday morning resulting in snowfall rates of 3 to 6 inches an hour.

December 2008 - The Town of Readsboro received approximately \$70,000 from FEMA for the ice storm event of December 2008 and the town owned electric department received approximately \$150,000 from FEMA for the same hazard event.

November 22, 1997 - A low pressure system south of Long Island on November 22, 1997 produced heavy wet snow across southern Vermont. Snowfall averaged 4 to 8 inches in Bennington and Windham Counties. The heavy wet snow downed trees and power lines, which produced scattered power outages. The power outages were most widespread in Windham County.

Nov. 26, 1996 - \$30K in property damage. On November 26, a low pressure system brought a combination of snow and freezing rain to southern Vermont. Over Bennington and Windham

Counties, snow and heavy freezing rain downed trees and power lines and caused numerous accidents. Across southern Vermont approximately 10,000 customers lost power.

Jan. 2, 1996 - A major winter storm developed over the Gulf coast states on January 2nd and tracked northeast along the eastern seaboard during January 3rd. Heavy snow fell across southern Vermont with the average snowfall ranging from 10 to 12 inches.

Dec. 19, 1993, \$5K property damage - Low pressure moved through central Pennsylvania and off the New Jersey Coast on the morning of the 19th resulting in 3 to 6 inches of snow across parts of southern Vermont. Some of the larger snowfall accumulations included: 6 inches at Woodford, Readsboro and Vernon; and 5 inches at Shaftsbury.

There are no recent records of ice jams in Readsboro.

Sources used

www.usatoday.com/weather/storms/winter/2011-03-08-vermont-snow-reocrds

<http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwevent-ShowEvent-307631>

Local knowledge and town records

HIGH WIND / TROPICAL STORM / HURRICANE

Description and Geographic Area of Hazard

High wind events are highly likely in Readsboro, resulting in damage in limited areas. The most likely local threats for high winds are from nor'easters, hurricanes, downbursts or wind shear.

Trees downed by high winds can block roads, and down power and communications lines.

Mobile home parks and houses on ridge lines are at greater risk from wind damage. Most high winds events in Readsboro have resulted in minor damage from downed trees and power lines.

Extent

Based on past occurrences the Town of Readsboro may anticipate winds in excess of 50 mph to affect the region due to low pressure systems coming out of the Canadian zone, or high pressures coming off the Gulf Coast. Extent/magnitudes of Hurricanes and Tropical Storms are ranked using the Saffir-Simpson Scale in the Western Hemisphere, as follows: CAT1=74-95 mph winds, CAT2=96-110 mph winds, CAT3=111-130 mph winds, CAT4=131-155 mph winds, Tropical Storm=39-73 mph winds, Tropical Depression=0-38 mph winds.

Probability

The town hazard emergency committee has stated that high winds are Highly Likely to occur in Readsboro based on past occurrences.

Past Occurrences

Aug. 28, 2011 - Tropical Storm Irene tracked north northeast across eastern New York and western New England during Sunday, August 28th, producing widespread flooding, and damaging winds across the region. Strong winds occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The strongest winds occurred from the north to northeast during the morning hours, then from the west to northwest during Sunday evening. The combination of strong winds, and extremely saturated soil led to numerous downed trees and power lines across the region. This also resulted in widespread long duration power outages. In particular, the approximate number of customers affected by power outages included: Windham County, 18000.

Mar. 10, 2002 - \$30K in property damage - The pressure gradient between deep low pressure over Ontario, and high pressure off the southeast coast, produced a strong southerly flow across southern Vermont on the evening of March 9. Then, a strong cold front moved across the region shortly after midnight, early on March 10th. A line of showers and embedded thunderstorms accompanied the front. Strong winds ahead of and along the front produced

some damage across Windham County. Law enforcement personnel reported a large number of trees and power lines down throughout the county.

Nov. 27, 1997 - The passage of a cold front produced strong winds across southern Vermont during the early morning hours of November 27. Winds gusting to 40-50 miles an hour downed trees and power lines in Bennington and Windham Counties. Approximately 1,500 customers lost power for a six to eight hour period.

Jan 19, 1996 - \$20K in property damage - An intense area of low pressure located over the Mid-Atlantic Region on Friday morning January 19th produced damaging winds across southern Vermont. This storm was associated with a strong southerly flow which resulted in scattered reports of downed trees, limbs and power lines.

Feb. 24, 1996 - \$30K in property damage - A rapidly deepening low pressure system moved from southern New Jersey northeast to northern Maine by the morning of February 25. This system brought damaging winds to southern Vermont including Bennington and Windham counties, which downed many trees across the area and produced scattered power outages.

Jul 20, 1996 - \$10K property damage - An unusually intense low pressure system tracked across the northern Great Lakes to Quebec, Canada during July 19 and 20. The system generated strong northwest winds, which downed trees and power lines over parts of Windham County in southern Vermont.

July 1995 - High wind-shear occurred in town, which resulted in numerous road obstructions, tree destruction, and damage to town highway #2.

Sept. 21, 1938 - A hurricane Igor hit the region of Southeast Vermont to include the Town of Readsboro, paralyzing it for weeks. As it was coming, packing winds over 100 miles an hour, authorities were unaware of the magnitude so no evacuation procedures were instituted and very few precautions were taken. As a result over 600 people lost their lives and tens of thousands were left homeless. Wind, rain and flash flooding wiped out trees, church steeples and buildings, leaving behind nearly \$400 million in damage.

Sources used

Local knowledge

<http://www4.ncdc.noaa.gov/cgi-win/wwcqi.dll?wwevent~ShowEvent~307631>

Assessing Vulnerability: Overview

A vulnerability analysis for each community begins with an inventory of possible natural hazards and an assessment of the risk that they pose. These are the questions to be answered. What hazards can affect your community? How bad can it get? How likely are they to occur? What will be affected by these hazards? How will these hazards affect you? The magnitude (percentage of the community affected) of the impact of the hazard can be classed as follows:

- Negligible: < 10% of properties damaged/Minimal disruption to quality of life.
- Limited: 10% to < 25% of properties damaged/Loss of essential facilities/services for up to 7 days/few (< 1% of population) injuries possible.
- Critical: 25% to 50% of properties damaged/Loss of essential facilities/services for > 7 days < 14 days/Major (< 10% of population) injuries/few deaths possible.
- Catastrophic: > 50% of properties damaged/loss of essential facilities/services for > 14 days/Severe (> 10% of population) injuries/multiple deaths possible.

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

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

Additionally, seasonal patterns that may exist are considered, what areas are likely to be affected most, the probable duration of the hazard, the speed of onset (amount of warning time taking into consideration the existing warning systems).

The combination of the **magnitude** of the hazard and the **frequency** was used to determine the **community vulnerability** as HIGH, MODERATE or LOW. For example, a flood event is highly likely (nearly 100% probability in the next year) in many communities but the degree of impact varies. A highly likely flood with critical or catastrophic impact rates the community vulnerability as HIGH. Another community with a highly likely or likely (at least one chance in the next 10 years) flood with a limited impact would receive a vulnerability rating of MODERATE. The vulnerability of a community having the occurrence of an event as possible or unlikely with limited or negligible impact would be LOW.

<u>Likelihood:</u>	<u>Impact:</u>
U = unlikely	N = negligible
P = possible	L = limited
L = likely	CR = critical
HL = highly likely	CA = catastrophic

Possible Hazard	Likelihood	Impact	Community Vulnerability	Most vulnerable facilities and populations
High Winds/Tornado/Microburst/Hurricane	HL	L	Moderate	Residences, Businesses, Roads, and Utilities, Bridges, Culverts
Flood	HL	L	Moderate	Low lying hills, West Branch and South Branch, Deerfield River Corridor, Drainage Ditches, Beaver Brook
Winter & Ice Storm	HL	L	Moderate	Roads, Utilities, Bridges, Town-wide
High Wind	P	L	Low	Residences, Businesses
Hurricane	U	CR	Low	Town-wide
Earthquake	U	CR	Low	Town-wide
Drought	P	L	Moderate	Residents, Farms, Businesses
Wildfire	L	L	Moderate	Residents, Businesses
Landslide	P	L	Low	Roads

Assessing Vulnerability: Addressing Repetitive Loss Properties

(a). According the State Hazard Mitigation Officer, Readsboro has no recent repetitive loss properties.

Assessing Vulnerability: Identifying Structures

(a). Below is a list of the most critical structures in Readsboro, which are not in the floodplain.

- Town Office, Readsboro Village
- Fire Department, Readsboro Village
- Central School, Readsboro Village
- Town Garage, Readsboro Village

The following buildings are Historical (some areas of Heartwellville are in the floodplain):

- Methodist Church, Heartwellville
- Old Coach Inn, Heartwellville
- First Baptist Church, Readsboro Village
- Old Wesleyan Methodist Church, Readsboro Village
- Readsboro Inn and Hardware Store
- E.J. Bullock Building
- Old Bee Hive
- Tunnel Street Tenement, Readsboro Village – A portion of Tunnel Street is in the floodplain.

Assessing Vulnerability: Analyzing Development Trends

(a). Below are figures taken from census.gov showing the population change in Readsboro from 1990 census to the 2010 census.

Town name	County	1990 Total	2000 Total	90-00 Absolute Change	90-00 % Change	2010 Total	00-10 Absolute Change	00-10 % Change
READSBORO	Bennington	762	805	43	5.6		-42	-5

Presently there isn't any development happening in Readsboro that would have any kind of impact on safety, health or general welfare in the Village.

See attached pdf files of Maps:

- 1.1 Existing Land Use 2004
- 1.2 Future Land Use
- 1.3 Culvert, Bridge and Road Surface

Multi-Jurisdictional Risk Assessment

The matrix on page 13 shows the risk assessment specific to the Town of Readsboro.

MITIGATION STRATEGY

Local Hazard Mitigation Goals

(a). The Hazard Mitigation Goals as outlined below were developed by consensus among the emergency management committee during meetings for the Town of Readsboro local hazard mitigation plan.

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

Identification and Analysis of Mitigation Actions

The Readsboro Hazard Mitigation Committee identified the following new hazard mitigation activities based on an evaluation of hazard event vulnerability not addressed by existing hazard mitigation initiatives and the feasibility of new activities.

Readsboro has some immediate pressing problems with regards to general safety in the town. The fire hydrants were taken out of service in 2008 because they are 6" and need to be 8" in diameter. The current system is outdated and is not large enough to provide pressures needed for both firefighting and domestic water service. Since the current hydrant system is out of service, if used for firefighting, the domestic water service could be jeopardized by contaminating drinking water. Readsboro has two phases planned to remedy this problem. Although they are in two phases, the first phase is not dependent on the second phase to be effective and operational. Phase One stands alone as a mitigation strategy. Phase Two enhances Phase One. Phase One would be to replace approximately 1,200 ft. of 6" water main with a 12" water main to increase water flows for firefighting purposes. Phase Two would be to extend from the end of Phase One across the Rt. 100 bridge to the center of town, giving the village center a compliant fire hydrant.

The Town is in the process of investing \$1.3 million in the municipal water system. Water System Improvements involve the upgrade of the existing water treatment facility components and the replacement of the existing 6" cast iron water main with approximately 2,170 feet of new 12" Ductile Iron, and one residential booster pump station.

Major repairs, in direct response to Hurricane Irene's include repair and relocation of a municipal water pipe from within the river to span the Lions Club foot bridge, and the emergency reconstruction of Bridge #31 over the west branch of the Deerfield River. Reconstruction will

include rising the stream bed elevation and lining the stream banks with type IV stone fill and mortaring in place.

The town is also in serious need of culvert replacements. There is the need for a culvert replacement at Rt. 8 and County Land in the Heartwellville section of town, which is prone to flooding after receiving 4" of rain in a 24 hour period. The flooding makes the County Lane a dead end road and impassable causing basement flooding in nearby residences.

Another pressing problem in Readsboro is the lack of back-up energy in the case of frequent power outages. During the ice storm of 2008, approximately half the population was without power. The generator at the fire house is over 30 years old and needs to be replaced. Strong winds have been increasing through out the years, causing power outages as often as two or three times a year. All of the critical facilities in town need, at the very least, transfer switches installed. In the case of an emergency, facilities that would be used as shelter include the Catholic Church and Central School. Other critical facilities include the Town Garage, General Store/gas station, and the apartments on Tunnel Street which house many elderly folks using oxygen machines. If transfer stations were installed in numerous facilities, it is possible the town could suffice with two new roving generators.

Cellular service is most often not available in town, forcing emergency communication to be dependent on land lines. There is also a lack of Internet service. For this reason, the town would be better served by a computer generated multiple phone dialer system to report hazards to the general population. Ideally, the town needs a cell tower.

The committee is planning to meet in the spring of 2012 to assess additional implications of Hurricane Irene. The vast soil erosion is still a high concern which may be complicated with the annual spring-thaw and high-river banks. Lesson learned will be considered and added to this plan.

Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

(a). NFIP Description: The Town of Readsboro has Flood Hazard Area Regulations as a stand-alone ordinance and currently participates in the National Flood Insurance Program which was updated in 2007. Additionally, Readsboro has no repetitive loss properties per FEMA's definition.

(b). NFIP Action: The Town of Readsboro participates in the NFIP. Additionally, the new DFIRMs were recently released for Bennington County. Readsboro has provided the new maps for public review and comment. They are presently in the process of re-writing their Flood Regulations Ordinance with the help of WRC and VT State DEC River Management division, because it was very out dated. The timeline for that process began in June, 2011. A public hearing is scheduled for Jan. 5, 2012 for making comments and adoption of an Interim floodplain bylaw for the town. One of the additional goals of this bylaw is to merge the Village of Readsboro with the Town of Readsboro. This will show that the Town is responsible for all land use within its boundaries.

Implementation of Mitigation Actions

(a). Mitigation actions are listed in priority order, with the most critical needs listed at the top of the list. The following criteria were used in establishing project priorities. The ranking of these criteria is largely based on the best available information and best judgment as many projects are not fully scoped out at this time.

- Does the action reduce damage?

- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures or structures critical to town operations?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Is the action legal?
- Does the action offer reasonable benefits compared to its cost of implementation?
- Is the action environmentally sound?

The following list of mitigation strategies was put together in December, 2010 by the Planning Commission of Readsboro, VT. At the time of applying for FEMA's PDM-C, FMA or HMGP grant programs, each project listed below will undergo full benefit-cost analysis (BCA) methodology, version 4.5 or higher to maximize savings.

HAZARD MITIGATED	ACTION	RESPONSIBLE PARTY	TIMEFRAME	FUNDING SOURCE	M = MITIGATION P = PREPAREDNESS	Project Priority
HIGH WINDS	Potentially Hazardous Tree Assessment – Remove dead or dangerous tree limbs near power lines	Road Foremen	Continual Basis - Annually	Highway Dept. Budget	M	Medium
HIGH WINDS	Assess policies and actions in the Town Plan regarding building codes and practices related to impacts of high wind	Planning Commission	2 years	Town Funding or Municipal Planning Grant	M	Medium
WINTER STORM / ICE STORM	Potentially Hazardous Tree Assessment – Remove dead or dangerous tree limbs near power lines	Road Foreman	Continual Basis - Annually	Highway Dept. Budget	M	Medium
FLOOD	Culvert replacement at Rt. 8 and County Lane in Heartwellville	Selectboard, Department of Public Works	2012	HMGP Grant Funding or Highway Dept. Budget	M	Medium high
FLOOD	Embankment stabilization of washed out river bank that exposed the bridge footing to bridge #31	Department of Public Works	2012	HMGP Grant Funding or Highway Dept. Budget	M	High
FLOOD	Reinforcement of the retaining wall behind the Town Garage	Selectboard	2012	HMGP Grant Funding or Highway Dept. Budget	M	High
FIRE	Phase One: replace approx. 1,200 ft. of 6" water main with 12" water main to increase water flow for firefighting purposes	Selectboard	Depending on funding 2012	Grant Funding/other sources	M	High

FIRE	Phase Two: extend from end of Phase One across the Rt. 100 bridge to the center of town, giving the village center a compliant fire hydrant	Selectboard	2012-2013	Grant Funding/other sources	M	High
ALL HAZARDS	Installation of Cell Tower in Town	Planning Commission Selectboard	2012	Verizon or AT&T	P	Med
ALL HAZARDS	Installation of transfer switches on critical facilities: Fire Station, Catholic Church, Central School, Town Garage and Tunnel Street	Selectboard	2012	Fire Dept. Budget	P	Medium Medium
ALL HAZARDS	Purchase to two new generators and mobile platforms for revolving usage.	Selectboard Water & Sewer Department	2012	Red Cross Generator Grant Fund	P	Low
ALL HAZARDS	Inventory of vulnerable populations, and locations plotted on map.	Emergency Management Coordinator 911 Coordinator	2011	Fire Department Budget	P	Medium
WINTER STORM / ICE STORM	Purchase of cots, blankets & pillows for emergency shelter.	Emergency Management Coordinator 911 Coordinator	2011	VT Emergency Management	P	Low
ALL HAZARDS	Purchase of storage unit for emergency shelter items.	Emergency Management Coordinator 911 Coordinator	2011	VT Emergency Management	P	Low
ALL HAZARDS	Education to citizens to keep emergency kits in cars, at home, etc. Education to location of emergency shelter. Fire Dept. does system checks or resources prior to storms	Emergency Management Coordinator, 911 Coordinator, Selectboard, Planning Commission	2012	Fire Department budget	P	Medium

(c). At the time of applying for FEMA's PDM-C, FMA or HMGP grant programs, each project listed below will undergo the full benefit-cost analysis methodology (BCA version 4.5 and higher) to maximize savings.

Fluvial Erosion Hazard Zones (FEH)

In acknowledgement that existing technical resources and land use guidance or regulatory authorities, such as the National Flood Insurance Program, do not adequately identify high risk areas for development along riparian corridors with respect to fluvial erosion hazards it is therefore deemed a high priority of this Hazard Mitigation Plan to provide the technical support for, and to develop and implement protection mechanisms at the local level that will serve to avoid land use investments that would be, over time, endangered by, incompatible or in conflict with fluvial adjustment and erosion processes. Fluvial assessments shall be conducted as guided by the VT ANR Fluvial Geomorphic Assessment Protocols, in the Town of Readsboro, as VT ANR deems necessary.

No later than one year after completion of the fluvial geomorphic assessment, the town, under contract with the Regional Planning Commission, or other GIS mapping service provider, shall develop a fluvial erosion map. Such map shall be consistent with mapping standards and protocols developed by VT ANR.

Multi-Jurisdictional Mitigation Actions

(a). See matrix listed in the section Implementation of Mitigation Actions

PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan

(a)(b) & (c). The Town of Readsboro will continue to work with the Windham Regional Commission to monitor, evaluate, and update the plan throughout the next 5 year cycle. A review of the plan will take place each year by the emergency planner at the Windham Regional Commission along with the Town's emergency planning committee to update the plan after any FEMA disaster declaration as well as any funding received from FEMA, to record any hazard related events, or to determine if the town is interested in applying for grant funding. Regular review of the plan will take active involvement on the part of the Readsboro emergency committee that includes the Road Foreman, Fire Chief, Selectboard and members of the Planning Commission, working with Windham Regional Commission staff to identify and plan for ongoing hazard mitigation work and coordination among stakeholders to identify structures and engineering projects that can help mitigate future hazardous events; e.g. bridge and culvert replacements, road replacements and grading, as well as any repetitive loss structures that may be in the Special Flood Hazard Area as identified on FEMA Flood Maps (e.g. FHBM and FIRM maps). Public input would also be included.

Additionally, all plan review meetings will be publicized and open to the public. Public hearings will be held prior to any significant revisions to the plan. The plan and any proposed revisions will be on the jurisdiction's website with information on how the public can direct questions/comments to the planning team.

Incorporating into Existing Planning Mechanisms

(a). The following policies, programs and activities related to hazard mitigation are currently in place and/or being implemented in the town of Readsboro. The Committee analyzed these programs for their effectiveness and noted improvements needed.

Type of Existing Protection	Description	Effectiveness/Enforcement/Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
Town Plan	Plan for coordinated town-wide planning for land use, municipal facilities, etc.	Flooding Addressed	New Town Plan adopted in September 2010.
Town Basic Emergency Operation Plan	Municipal procedures for emergency response	Incident Command; Hazard Annexes included	BEOP completed in 2011 and adopted by Town Select board
School Emergency Response Protocol	School procedures for emergency response	School Crisis Plan	School Crisis Planning Team Facilitator currently meeting with schools and First Responders to asses gaps and offer solutions
Mutual Aid – Emergency Services	Agreement for regional coordinated emergency services	Keene (NH) Mutual Aid – written agreement/contract for Fire/Ambulance and HazMat	None identified
Mutual Aid – Public Works	Agreement for regional coordinated emergency highway maintenance services	Unknown whether Public works MAA in place	None identified

Road Standards	Design and construction standards for roads and drainage systems	Generally Vtrans Standards Bridge and Culvert Inventory work	No major gaps identified
Subdivision Regulations	Regulates the division of land, standards for site access and utilities	NA	NA
Sewage Regulations	Regulates on-site sewage systems	State Regulations apply	None Identified
Flood Hazard Area Regulations	Regulates development in FEMA flood hazard areas	Town Zoning Bylaw attachment.	Presently being revised to include new FEMA DFIRM's.
Site Plan Review (SPR)	Site development standards	Town Zoning Regulations	None Identified
Maintenance Programs	Bridge & Culvert Inventory	Updated in 2006 Completed Annually	None Identified
Building Code	Regulates building construction standards	Through Labor and Industry	NA
Wetland protection – VT Wetland Rules	Protected by 1990 Vermont Wetland Rules	Protection of environment, water resources, wildlife, biota	None Identified

(b). At the Town Meeting every March, policies and action items in the Town Plan are reviewed and integrated into hazard mitigation as needed. The Basic Emergency Operations Plan contact list is updated after Town Meeting each year, including updates to vulnerable geographic locations, as well as locations of vulnerable populations.

ATTACHMENTS

1. Sign-in Sheets for Emergency Planning Committee Meeting
2. Letter from Green Mountain Engineering & Map showing Readsboro Water System Improvement locations
3. Maps – (Attached as separate pdf files)
 - a. Existing Land Use 2004
 - b. Future Land Use
 - c. Culvert, Bridge and Road Surface

Sign in sheet from October 2, 2010 Meeting.

READSBORO -- PRE-DISASTER HAZARD MITIGATION PLANNING MEETING
 October 7, 2010
 Location: Readsboro Central School
SIGN IN SHEET

Name	Affiliations - Please list all	Town where you live	Phone	email
CRISTINA BARKUS BARKUS EXC	SELECTMAN TOWN OF READSBORO BARKUS EXC	Readsboro	1-802-425-2044	BARKUS_AT_MY_FOUNDRY@GMAIL.COM
Anthony Caruso	SELECTMAN TOWN OF READSBORO SARAWAN CARUSO	Readsboro	1802-425-2044	skiddler21@yahoo.com
RAMONDO ELLERES	SELECTMAN TOWN OF READSBORO BEST FIRE CHIEF OWNER ELLERES BROS TREE	READSBORO	802-423-9919	RAMONDO.ELLERES@GMAIL.COM
Audon Bailey	Planning Commission Chair Development Review Board Housing Development Com	Readsboro	802-423-7080	bailesme@mybroadband.net
Paul Murchiegan	Fire Chief	Readsboro	802-423-7674	

