## Town of Pawlet Vermont Local Hazard Mitigation Plan

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With Technical Assistance Provided by the Rutland Regional Planning Commission



RUTLAND REGIONAL PLANNING COMMISSION

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#### 1 Introduction

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this plan is to provide an all-hazards local mitigation strategy that makes the Town of Pawlet more disaster resistant.

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. 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.

## 2 Purpose

The purpose of this Hazard Mitigation Plan is to assist the Town of Pawlet, VT in identifying all hazards facing the community and identify strategies to begin reducing risks from identified hazards. Once adopted, the local mitigation plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property.

Adopting and maintaining this Local Hazard Mitigation Plan will provide the following benefits:

- Make certain funding sources available to complete the identified mitigation initiatives that would not otherwise be available if the plan was not in place.
- Ease the receipt of post-disaster state and federal funding because the list of mitigation initiatives is already identified.
- Support effective pre- and post-disaster decision making efforts.
- Lessen the Town's vulnerability to disasters by focusing limited financial resources to specifically identified initiatives whose importance has been ranked.
- Connect hazard mitigation planning to community planning where possible.

The community vulnerabilities emphasized and addressed in this plan are:

Vulnerable Critical Infrastructure include the Rt 133 Bridge, the fire station, the Mettawee Community School- including it's early education and after school programs, and four child care facilities.

VT 153 at River Rd

Rt 149 near Rt 30, at Loomis trucking

Rt 30 at Tiffany Lane

Rt 153, north of Consider Bardwell Farm

Herrick Brook Road-1/2 mile of shoulder damage from high water and runoff.

VT Rt. 133—erosion behind firehouse.

VT Rt. 133—flooding over road for over ½ mile where Flower Brook runs alongside road. Creates access problems and dangerous travel conditions.

Mill Pond—floods village center.

Danby Pawlet Road—spring flooding causes culvert damage (new 4X6 precast box culvert installed)

Deer Run Rd—flooding and culvert damage (new culverts have been installed)

VT Rt. 149— Mettawee River floods over road. Creates access problems and dangerous travel conditions.

River Road—Mettawee River floods over road. Creates access problems and dangerous travel conditions.

VT Rt. 153—flooding over road in several areas

West Pawlet Village—5 homes flooded.
Sawmill Road—road and bridge damage caused by flooding.

Hi Go Road—flooding and culvert damage. (Received Better Back Roads Grant in 2009)

Tadmer Road — repeatedly damaged roadway; two culverts need upgrade to eliminate flooding risk.

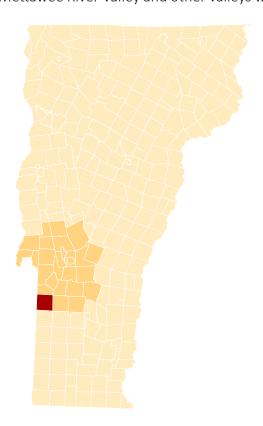
## 3 Community Background

#### **Land Use and Development Patterns**

The Town of Pawlet is rural in nature, with several population centers. The two major population centers are Pawlet Village, located at the junction of Routes 30 and 133, and West Pawlet, located at the junction of Route 153, Railroad Street and Egg Street, close to the town border with Granville, New York. Most of the commercial and retail establishments are located in the village centers. The Town offices are located in Pawlet Village. West Pawlet developed around the former railroad depot and the slate industry, which operated numerous quarries in the vicinity. Smaller concentrations of residential development occur throughout the town.

A ridge of mountains, the most significant physical characteristic of the Town, runs through it in a northerly direction. Elevation within the Town varies from 421 feet to 2,088 feet above sea level. A parallel ridge lies to the east, its peaks just beyond the borders of the town. The valley between is both a significant feature of the Town and a notable topographic feature in comparison to the more narrow valleys characteristic across much of Vermont.

The Mettawee River Valley and other valleys within the



Town, provide broad level land that contributes to the persistence of farming in Pawlet.

Older housing is located in a linear pattern along the roads of the Town, in the historic New England manner. Newer housing is generally located away from roads, partly in clustered developments.

Agriculture, especially dairy farming, constitutes the most prominent land use in the Town. It also comprises the largest non-industrial employment. The valley lands are used extensively for farming and dairying. Some of these lands have been protected from development through the Mettawee Valley Conservation Project.

Industrial uses in the Town are principally quarrying and processing of slate, trucking, bulk fuel storage, lumber milling, cheese production, and design and manufacture of clothing products. There are many self-employed tradesmen, foresters, and loggers. Numerous cottage industries thrive in Pawlet as well, such as weaving, pottery, cabinetry, jewelry, lamp shade fabrication, illustration, specialty foods, and services related to the World Wide Web.

#### **Demographics and Growth Potential**

According to current census data (2010) Pawlet's total population is 1,477 equaling close to 2 ½ percent of the region's overall population and making Pawlet the 12th largest town in the region. Historical growth rates within Pawlet have been steady, slightly higher than those of the region.

#### Precipitation and Water Features

Precipitation in Pawlet is typical of the rest of the region. The mountains feed a number of rivers and springs in the valley areas. Of these, the Mettawee River, Flower Brook, and Indian River have designated floodplains by FEMA.

#### **Water and Sewer Supply**

There is no municipal water system in the Town of Pawlet. The majority of wells servicing residences and commercial establishments are drilled. The town has plans to identify potential municipal water sources, so the steps can be taken to ensure the protection of the quality and quantity of these waters.

#### Sewer Services

West Pawlet has a municipal sewage system with the

capacity for 200 users. It currently has approximately 130 hookups using the system.

Throughout the rest of Town, sewage is disposed of on the lots of the individual or multifamily housing units that generate it. The units use septic tanks and drywells or leach fields for treatment and disposal. According to the Wastewater Disposal Systems Analysis prepared by Dufresne & Henry, Engineers, there may be a potential for contamination of the Flower Brook and Mettawee River from storm system overflows in the Pawlet Village area.

#### **Transportation**

Vermont State Routes 133, 30 and 149 provide access into and out of Pawlet. The present network of roads in Pawlet serves the needs of current residents. Hazard areas have been identified and it is understood that with increased traffic, these areas will need to be addressed.

Pawlet has a total of 21 bridges. Nine of these bridges have a span of 20 feet or more. Of this total, 6 are on the state system. Under new Federal regulations, any bridge 20 feet or over is eligible for Federal funding assistance

#### **Emergency Services**

Pawlet is served by two volunteer fire departments and has two fire districts; located respectively in West Pawlet and Pawlet Village. Mutual aid organizations from Rutland County, Bennington County and Washington County (NY) supplement these services. All dispatch is done by Washington County (NY) Department of Public Safety.

The town fire warden directs protection from forest fires.

Police protection is provided by the Town constables and by the State Police, currently from a headquarters in Castleton, contacted by calling Rutland or by dialing 911.

Emergency medical needs are served by the Granville Rescue Squad from Granville, NY. Rutland Region Medical Center and the Southwestern Vermont Health Care & Medical Center in Bennington offer major medical services within 40 miles from Pawlet. Clinic services are offered by Mettawee Family Health Center

on Rt. 149 in Pawlet and Granville Family Health in Granville, NY.

#### **Emergency Management Planning**

The Town has an Emergency Management Director appointed by the Select Board. The emergency management director is assisted by an Emergency Management Coordinator and Public Information Officer.

The Emergency Management team has an Emergency Operations Center at the Mettawee Community School with VHF radio equipment capable of communicating to both Fire Departments and the Town highway crew. The Emergency Management team assists the town in hazard mitigation, emergency preparedness, response and recovery.

Pawlet has a Local Emergency Operations Plan (LEOP) that outlines the key local personnel to contact in the event of an emergency and lists emergency operations centers and town shelter sites. These plans are reviewed, amended if necessary, and adopted by the Select Board on an annual basis. The LEOP lists mitigation actions and risk assessment derived from this plan.

## 4 Planning Process

The Rutland Regional Planning Commission (RRPC) and the Town of Pawlet coordinated the Local Hazard Mitigation Plan update process. Hazard Mitigation Grant Program (HMGP) funds from FEMA supported this process.

#### Updating the Plan

RRPC staff discussed updating the plan with town officials in Pawlet in June 2017, when the Pawlet EMD attended one of the LHMP Resource Meetings at RRPC on June 7, 2017. The town formed an LHMP committee. A thorough update of data was conducted by RRPC staff. Data sources on past hazard events were incorporated into the Community Hazard Inventory and Risk Assessment section, and local and regional policies/plans were incorporated into the Hazard Mitigation Strategy section. As discussed in the following section, the plan was also restructured to a single jurisdictional format. RRPC staff revised the plan throughout the planning process, circulating multiple draft plans to committee members and posting drafts on the town and RRPC website.

#### Local and Public Participation

The hazard mitigation committee meetings were publicly warned in the following locations: RRPC and Town of Pawlet office bulletin boards, and the RRPC and Town of Pawlet websites. Each meeting provided an opportunity for public discussion, questions, and comments on the plan.

The first committee meeting was held on June 26, 2017 in Pawlet at the West Pawlet Fire House. Participants discussed the purpose and timeline for updating the plan, other groups/individuals that should be aware of the plan preparation, and damages that occurred in town from Tropical Storm Irene. Town maps were reviewed and the town's hazards were ranked according to their probability, impact, and risk level. The committee discussed high risk hazards in further detail. After this meeting a draft plan was developed by RRPC staff and circulated to committee members.

The second and third committee meetings were held on via phone and email. The committee reviewed the updated draft plan and made changes as necessary. The committee discussed and agreed upon the town's mitigation goals. Then committee members discussed the status of each mitigation action from the town's last plan, and identified new mitigation actions for the town.

A 14 day public comment period for the draft plan was held from October 4- 20, 2017. The comment period was warned by posting at the town office, website, and other designated spaces in town; the RRPC office and website; and in the Rutland Herald (see Appendix C for notice). The following neighboring towns planning commissions and emergency management directors were invited by email to review and comment on the plan: Rupert, Dorset, Danby, Wells, . These organizations were also emailed regarding the public comment period: Poultney Mettowee and Rutland Natural Resources Conservation Districts.

All entities (surrounding towns, town residents, and local organizations) were told to mail, phone in, or email comments to Elysa Smigielski, RRPC, and/or town of Pawlet. No comments were received during the entire update process.

The draft plan was then submitted to VEM hazard mitigation planning staff for review. Required and recommended revisions received from VEM were addressed by working with the town's hazard mitigation committee members on an individual basis.

The plan was then submitted to FEMA Region I for review. Upon receiving FEMA's Approval-Pending Adoption (APA) status, the final plan was reviewed by the Selectboard and adopted after the hearing on the same date. The final plan with the local adoption certificate was forwarded to FEMA Region I and the State Hazard Mitigation Officer, and on date final FEMA approval of the plan was granted.

#### Plan Evolution

A local hazard mitigation plan was originally adopted by the town as an Annex to the Rutland Region All Hazards Mitigation Plan in 2004, which received FEMA final approval in 2004. This plan is a single jurisdictional local hazard mitigation plan.

There has not been a change in the town's mitigation action priorities between this plan update and the 2012 plan. All plans, including this one, have placed flooding mitigation as the highest town priority, as flooding is the highest and most prevalent risk hazard in the town.

The town will incorporate the hazard mitigation concepts and actions from this plan in to their next town plan update, slated for 2020. The Hazard Mitigation Committee is unsure of incorporation of mitigation actions and concepts from the 2004 plan, since all members of the committee obtained their town positions after 2011 and therefore were not involved in the previous mitigation action plan development.

Recent development in town over the past decade has included the construction of single family homes. In a typical year, the Town of Pawlet will see 2-3 new residential houses built — and they have always been built outside of the floodplain.

While there is not a lot of new construction activity in town, there is a lot of rehabilitation of exisiting structures.

The strict flood regulations adopted by the town in 2011 ensure that all new construction, infill construction, and rehabilitation of sturctures complies with flood mitigation measures, and that the construction/development reduces the vulnerability of the structures to floods.

Thus, development has not made the town more vulnerable, since development has not occured in flood zones or other hazardous areas.

The hazard mitigation actions from 2004 are located in Appendix D.

#### Additional Resources

In addition to the local knowledge of committee members and other relevant parties, the following documents and resources were utilized in the preparation of this plan:

National Oceanic and Atmospheric (NOAA) National Climatic Data Center's Storm Events Database

National Weather Service (Burlington, VT) Recent Weather Event Summaries

Vermont Department of Environmental Conservation Waste Management Interactive Database

FEMA Disaster Declarations for Vermont

OpenFEMA Dataset: Public Assistance Funded Project Summaries for Vermont

U.S. Geological Survey National Water Information System- Stream Gage Data

"Climate Variability and Socioeconomic Consequences of Vermont's Natural Hazards: A Historical Perspective" by Lesley-Ann Dupigny-Giroux, 2002, Vermont History 70: 19-39.

United States 2000 and 2010 Census

**Rutland Herald Archives** 

Rutland Region All Hazards Mitigation Plan (2012)

State of Vermont Hazard Mitigation Plan (2013)

FEMA Flood Insurance Rate Maps

Relevant Stream Geomorphic Assessments and/or River Corridor Plans

Town plan (2012) & land use bylaws (2010)

## 5 Community Hazard Inventory and Risk Assessment

What follows is an analysis of local natural hazards and human-caused hazards based upon review of the Local Hazards and Vulnerabilities Map produced for the town (see Appendix B), review of existing data, and information provided by local officials and stakeholders. Whenever possible, the issues identified below are represented on the map in Appendix B.

#### Local Vulnerabilities

The vulnerabilities identified in Section 2 of this plan drive this hazard mitigation plan and the town's mitigation strategies, in order to reduce potential losses in the community.

#### Risk Assessment

The Risk Assessment table below lays out all the hazards identified for the town and

covered in this plan. Each hazard was discussed by committee members and ranked in terms of its Probability and Impact, and then given an overall Risk Level (see table endnotes). This assessment resulted in the categorization of High and Low Risk Level hazards for the town. Following the Risk Assessment table is a detailed discussion of High Risk hazards including tables on Hazard History and Hazard Summary. Note that the Low Risk hazards that are considered to have low incidence and low probability (i.e. Drought, Extreme Temperatures, Earthquakes, Hurricanes and Tropical Storms, Ice Jams, Landslides and Rockslides, Tornadoes, and Wildfires and Forest Fires) in the community are not profiled in detail in this plan. For more detailed information on these hazards, please consult the State Hazard Mitigation Plan. Despite the overwhelming impact that Tropical Storm Irene had on the Town in 2011, tropical storms are not profiled in this plan due to the low incidence and low probability of the high winds that are usually associated with Tropical Storms. If and when Pawlet is affected by a tropical storm, the effect on the town is flooding, and therefore flooding caused by Tropical Storms is covered in the flooding profile.

Hazard	Probability <sup>1</sup>	Impact <sup>2</sup>	Risk Level <sup>3</sup>
Climate Change	*	*	*
Drought	Low	Low	Low
Earthquakes	Low	Low	Low
Extreme Temperatures	Low	Low	Low
Floods and Fluvial Erosion	High	High	High
Hurricanes and Tropical Storms	Low	Moderate	Low
Ice Jams	Low	Low	Low
Landslides and Rockslides	Low	Low	Low
Thunder and Wind Storms/Hail	High	High	High
Snow and Ice Storms	High	High	High
Tornadoes	Low	Low	Low
Wildfires and Forest Fires	Low	Medium	Low

<sup>1</sup> High likelihood of happening: Near 100% probability in any given year. Medium likelihood of happening: 10% to 100% probability in any given year (at least once in the next 10 years).

Moderate impact: Occurrences of moderate to severe property damage, temporary shutdown of critical facilities, and/or injuries or fatalities. Major impact: Severe property damage on a town-wide scale, shutdown of critical facilities, and/or multiple injuries or fatalities.

Low likelihood of happening: 1% to 10% probability in any given year (at least once in the next 100 years).

<sup>2</sup> Minor impact: Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries.

<sup>3</sup> Based on Probability and Impact, is the risk level: High or Low? Risk is defined as the potential for damage, loss, or other impacts created by the interaction of hazards with community assets

#### High Risk Hazard Inventory\*

#### **Climate Change**

Climate change is defined by the Intergovernmental Panel on Climate Change as "... a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity." The 2014 Vermont Climate Assessment (based on the National Climate Assessment) shows that the average annual temperature in Vermont has increased by 1.3 degrees Fahrenheit since 1960, and 45% of that temperature change took place since 1990. The growing season in the state has lengthened due to warming, along with a shorter freezing period in the winter. Average annual precipitation has also increased 5.9 inches, and again much of that change (48%) has occurred only since 1990.

Looking ahead, it is projected that temperatures in Vermont will rise by another 2 to 3.6 degrees Fahrenheit by the year 2050. Precipitation will continue to increase, particularly during wintertime and in mountainous areas. More weather extremes will occur in Vermont, such as record-breaking high temperatures and high-energy lightning storms. The impacts of these projected trends in Vermont will be more severe natural disasters, increased energy demands, power outages, high stream flows and flooding, stress on trees, changes to agriculture, and changes to recreation and tourism seasons. It is clear that the already felt and future effects of climate change will intensify a variety of other hazards, such as flooding/fluvial erosion, severe thunderstorms, and winter storms.

The town will not be profiling climate change as a high risk hazard due to the present day difficulty of analyzing storm history for climate change trends and for identifying specific examples of climate change. However, the Town understands and appreciates the importance of cataloging weather events in an effort to understand how certain natural hazards may change in their intensity and/or frequency as a result of climate change. The Town acknowledges that by continuing the efforts of compiling a complete storm record for the high risk hazards – flooding, thunderstorms, and snow and ice storms – the Town may, in the future, analyze the presence and effects of climate change within the Town.

#### Floods and Fluvial Erosion

Flooding is the overflowing of rivers, streams, drains and lakes due to excessive rain, rapid snow melt or ice as well as overflow of banks caused by sudden high water flow due to breaching of dams (both human-made and natural dams caused by beavers or debris build-up). Flooding of land adjoining the normal course of a stream or river has been a natural occurrence since the beginning of time. If these floodplain areas were left in their natural state, floods would not cause significant damage.

Floods can damage or destroy public and private property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and result in fatalities. People may be stranded in their homes for a time without power or heat or they may be unable to reach their homes. Long-term collateral dangers include the outbreak of disease, loss of livestock, broken sewer lines or wash out of septic systems causing water supply pollution, downed power lines, loss of fuel storage tanks, fires and release of hazardous materials.

While inundation-related flood loss is a significant component of flood disasters, the more common mode of damage in Vermont is associated with fluvial erosion, streambed and streambank erosion, often associated with physical adjustment of stream channel dimensions and location during flood events. These dynamic and oftentimes catastrophic adjustments are due to bed and bank erosion, debris and ice jams, or structural failure of or flow diversion by humanmade structures. An ice jam occurs when the ice layer on top of a river breaks into large chunks which float downstream and cause obstructions (State HMP 2013). The town does not have a high incidence or high probability of ice jams.

As noted in the State Hazard Mitigation Plan, "Flooding is the most common recurring hazard event in the State of Vermont" (2013: 4-7). Several major flooding events have affected the state in recent years, resulting in multiple Presidential Disaster Declarations. From 2003 to 2010, Rutland County as a whole experienced roughly \$1.4 million in property damages due to flood events (State HMP 2013). The worst flooding event in recent years came in August of 2011 from Tropical

Storm Irene, which dropped up to 10-11 inches of rain in some areas of Rutland County (State HMP 2013: 4-61). Although the storm was technically a tropical storm, the effects of the storms are profiled in this flooding section, due to the fact that the storm brought only large rainfall and flooding to the town, not the high winds typically associated with tropical storms. This caused most streams and rivers to flood in addition to severe fluvial erosion.

Flooding is the greatest risk to the Town of Pawlet. Rain from Tropical Storm Irene totaled around 7 inches on August 27-28, 2011, causing significant damage to many roads and at least five homes. Flower Brook in downtown Pawlet overtopped Route 30 at the bridge. Although all roads were passable within one day, complete repairs took multiple weeks. Although rainfall rates never exceeded 2 inches per hour, saturated ground conditions before the event directed all precipitation into surface waters causing immediate flooding. At Middle Granville, New York, the USGS gauge recorded a peak of 15 feet on the Mettawee River, which is 8 feet above flood stage. The gauge is located approximately 14 miles downstream from Pawlet Village.

The storm event of December 16 and 17, 2000 caused extensive flooding, that amounted to  $^{\sim}$100,000$  in damage.

Both storms caused significant damage to both town infrastructure and to private property. The largest impacts were to private property and not to Town infrastructure.

#### Severe Thunderstorms

Severe thunderstorms can produce high winds, lightning, flooding, rains, large hail, and even tornadoes. Thunderstorm winds are generally short in duration, involving straight-line winds and/or gusts in excess of 50 mph. Thunderstorm winds tend to affect areas of Vermont with significant tree stands as well as areas with exposed property and infrastructure and aboveground utilities. Thunderstorm winds can cause power outages, transportation and economic disruptions, and significant property damage, and pose a high risk of injuries and loss of life. From 2004 to 2010, for thunderstorms that caused more than \$200,000 in damage, Rutland County experienced nearly \$2 million in property damage. (State HMP 2013: 4-38 to 4-42) Rutland County experienced severe thunderstorms on May 18, 2004 which included large hail (near oneinch diameter) and damaging winds up to ninety miles per hour (National Weather Service). Hail is a form of precipitation composed of spherical lumps of ice. Known as hailstones, these ice balls typically range from 5-50 mm in diameter on average, with much larger hailstones forming in severe thunderstorms. The size of hailstones is a direct function of the severity and size of the thunderstorm that produces it. (State HMP 2013: 4-68) Much of the hail activity in Rutland County is scattered and varies in intensity, and the resulting damages usually takes form in uprooted trees, downed power lines, and crop damage.

The town is not as vulnerable to thunderstorms/ windstorms as it is to flooding. Typically towns' vulnerability to thunder and windstorms are power outages. The town could be vulnerable to a power outage caused by a thunder/wind storm, however, should a wind event knock down a tree and disrupt power service to the Town Office. Violent windstorms are possible here. Most windstorms result in downed trees, damaged phone and power lines, and crop losses. Should a wind affect the power lines in the downtwon center, power disruption could affect all or many of the public buildings/critical facilities: the churches, library, school, town office, and/or post office.

The town has reduced its vulnerability to power outages by having numerous generators in town. There are generators at the three town shelters: both fire houses and the Mettawee School. The Mettawee school also serves as the EOC.

#### **Winter Storms**

In the Rutland Region, most winter weather events occur between the months of December and March. Throughout the season, winter weather events can include snowstorms, mixed precipitation events of sleet and freezing rain, blizzards, glaze, extreme cold, the occasional ice storm, or a combination of any of the above. Events can also be associated with high winds or flooding, increasing the potential hazard.

Total regional damages due to winter weather events peak at over \$1,000,000 per month in January, February, and March. The costs of these storms come in the form of power outages due to heavy snow or ice accumulations, damaged trees, school closings and traffic accidents. From 2002 to 2010, Rutland County experienced \$1.1 million in property and crop damages from winter storms (State HMP 2013). There have only been two winter storm related federally declared Disasters in the county (the ice storm of January 1998 – DR 1201, and the severe winter storm of December 2000 – DR 1358). Historically, the winter storm of December 1969 brought record snowfall amounts and snowdrifts to Vermont, and later freezing rain caused prolonged power outages (Dipugny-Giroux 2002: 26).

The town is not as vulnerable to snow and ice storms as it is to flooding. Typically towns' vulnerability to snow and ice storms are power outages and loss of road accessibility. However, the town could be vulnerable to a power outage caused by ice/wet snow accumulation on power lines or trees falling on powerlines due to weight of ice accumulation in a storm, especially if the outage disrupts power service to the Town Office. Also, snow accumulation has not made the town vulnerable to loss of road accessibility. The town's fleet of snow plows has ensured that roads are accessible, even in major snow accumulation events.

Should a snow and/or ice storm affect the power lines in the downtown area, power disruption could affect all or many of the public buildings/critical facilities: the churches, library, schools, town office, and/or post office. The town has reduced its vulnerability to power outages by having numerous generators in town. There are generators at the three town shelters: both fire houses and the Mettawee School. The town also has snowmobiles on call in the event of transporting persons without power to a shelter.

#### **Hazard History**

Extent Impact

#### Floods

7.1.2017: Declared Disaster DR 4330. 4" of rain caused road damage and required culvert replacements. Cost to Pawlet ~ \$3,800

**8.28.2011**: Tropical Storm Irene Declared Disaster DR 4022. Over **11**" of rain caused extensive flooding and destruction to Pawlet Village. FEMA disaster declarations for Public Assistance and Individual Assistance, total cost ~\$200,000

October 7-9, 2005: Tropical Storm Tammy. 3-4" of rain

December 16-17, 2000: Heavy rains and flooding countywide, FEMA disaster declaration, cost to Pawlet—\$51,498.

July 2000: Declared Disaster DR 1336. Severe storms and flooding countywide, FEMA disaster declaration, cost to Pawlet—\$4,197

9.16.1999: DR 1307. TS Floyd. 5-6" of rain. January 1996: countywide flooding, FEMA disaster declaration, cost to Pawlet—\$36,763; cost to Pawlet Village—\$1,814.

6.28-30.1973: 6 inches of rain and flooding.
3.21.1936: First flood due to rain and snowmelt, plus second flood due to intense rainfall. Statewide damages ~\$1 million.

**11.3.1927:** Statewide flooding. 5-10 inches of heavy rainfall on frozen ground. Statewide damages: \$35 million including 1,000+ bridges, hundreds of miles of roads and railroad, and 84 deaths.

#### Thunderstorms and High Winds

9.11.2013: Thunderstorms and 1" hail.

6.17.2013: Thunderstorms and hail.

**8.21.2011:** Thunderstorms and hail. One isolated severe thunderstorm that produced wind damage in the form of downed tree branches.

**7.19.2010:** Thunderstorms and 60-80 mph winds. Downed tree branches and power lines

**5.26.2010:** Thunderstorms and high winds. Downed trees and powerlines.

8.16.2007: Thunderstorms and 60-80 mph winds.

**12.1.2006:** Thunderstorms and high winds, up to 59 mph gusts. Downed trees and powerlines.

**8.2.1993:** Thunderstorms and high winds. Cost to Pawlet~\$3,667.

#### Winter Storms

12.9.2014: 10-20 inches of snow.

3.12-13.2014: Winds with gusts to 35-40 mph . 8-24

inches snow

12.26.2012: Snowfall rate of 1-2 inches per hour.

Accumulations between 6-18 inches.

2.23.2010: 6 to 30" snow

1.2.2010: Snow

**12.11.2008:** Combined snow and sleet accumulation in central and northern Vermont ranged from 5 to 9 inches along with a glaze coating of ice.

4.15-16.2007: "Nor'icane" Declared Disaster DR
1698. A mixture of snow and rain . winds of 60 to 80 mph. Snowfall totals were generally 4 to 7 inches in the valleys with locally up to a foot along the east-facing slopes of the higher elevations of the Green Mountains. This was a heavy, wet snow that caused numerous power outages, hundreds of downed trees and power lines as well as extremely slick and treacherous roads that resulted in many vehicle accidents.

12.6.2003: 12 and 18" of snow

#### **Hazard Summary**

#### **Flooding**

Location: town-wide, but especially

Vulnerable Assets: Houses, bridges, culverts, wells,

businesses.

Extent: Tropical Storm Flooding: Up to 11" of rain

(Tropical Storm Irene).

Riverine Flooding: Otter Creek floods every spring and

floods Rt 73

Flash Flooding: Data currently Unknown

Fluvial Erosion: Bank erosion along the Flower Brook

Impact: Up to \$200,000 in damage caused to houses and infrastructure (Tropical Storm Irene, 2011)

Probability: High

#### **Thunderstorms and High Winds**

Location: town-wide

**Vulnerable Assets:** houses, trees, powerlines, roads Extent: Golf ball sized hail (1"), high winds (up to 80 mph)

Impact: Up to \$3,667 in damages caused to houses and

infrastructure (August 1993 storm)

Probability: High

#### Winter Storms

Location: town-wide

Vulnerable Assets: houses, trees, powerlines, roads

Extent: Up to 22" of snow. Up to 0.5" ice

Impact: The Public Works Director estimates that each major snow storm causes \$15,000-20,000 of damages. These snow storms include the December 2014, March 2014, December 2012, February 2010, and February 2007 storms.

Probability: High

## 6 Hazard Mitigation Strategy

The high risk hazards and vulnerabilities identified in the previous section of this plan directly inform the hazard mitigation strategy outlined below, which the community will strive to accomplish over the coming years. The mitigation strategy chosen by the town includes the most appropriate activities to lessen vulnerabilities from potential hazards.

#### **Mitigation Goals**

The hazard mitigation committee discussed mitigation goals, and recognized that due to the significant impacts of Tropical Storm Irene in 2011 the town now puts a higher priority on flood mitigation. The committee identified the following as the community's main mitigation goals to reduce or avoid long-term vulnerabilities to identified hazards:

Reduce the loss of life and injury resulting from all hazards.

Mitigate financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters.

Reduce the damage to public infrastructure resulting from all hazards, especially flooding and fluvial erosion.

Encourage hazard mitigation planning as a part of the municipal planning process.

Encourage the adoption and implementation of existing mitigation resources, such as River Corridor Plans and Fluvial Erosion Hazard Maps, if available.

Recognize the connections between land use, stormwater road design and maintenance and the effects from disasters.

Ensure that mitigation measures are sympathetic to the natural features of community rivers, streams, and other surface waters; historic resources; character of neighborhoods; and the capacity of the community to implement them.

#### Existing Authorities, Policies, Programs and Resources

The hazard mitigation plan is one of several plans and policies that influence local land use decisions. The town's ongoing and recently completed hazard mitigation authorities, policies, programs, and resources are listed below. These programs illustrate the community's capabilities regarding hazard mitigation, and show the town's commitment to incorporating mitigation into other planning mechanisms. The mitigation planning process is continual, and as new issues arise the town will incorporate new information into local plans and other documents as appropriate.

#### **Town Capabilities**

The Town of Pawlet has three full time employees (highway department) and 10 elected officials.

There are five Select Board members, a Treasurer,
Town Clerk and three Listers. Appointed part time
paid positions are Town Clerk Assistant, Select Board
Assistant, Waste Water treatment technician and
Health Officer. All other committees and positions are
on a volunteer basis.

The town's annual budget is approximately \$850,000.

Some capabilities are limited in town by its size, staff, and limited revenue base. Because Pawlet is small and limited in new growth, the existing capabilities of the town handle most issues easily. It is possible that increased growth would strain current capabilities, however the town also plans for future needs in their budget process. One example of this is planning for new equipment in the Capitol Reserve Fund. The town does not always have the capacity to take on new grants and update policies and plans, but the town does have the capacity to contract with the RRPC, to have RRPC assist with grant writing and policy writing.

With regard to mitigation action implementation, the Town has existing capabilities within the Highway Department to undertake the replacement of culverts. The Emergency Management Director also has the ability to seek grant funding for assistance with mitigation action implementation.

Flooding: Tropical Storm Irene in 2011 caused the most damage in Pawlet in recent memory. The storm of July 1, 2017 also caused some minor damage and also the closing of the three state roads in town for a period of about six hours.

Fire protection: There are 45 volunteer fire fighters in Pawlet in two fire departments. The West Pawlet Fire Department is located in the West village and the Pawlet Fire Department is located in the East village. The fire protection equipment consists of four engine/tankers, a brush truck, a utility truck and a tank truck. Firefighting water supply is provided by numerous dry hydrants and pond or stream/river access. The Pawlet firehouse is located in the Flower Brook floodway and has been isolated by flood waters twice in the last six years. As a town critical infrastructure building the firehouse should be located in a safer location.

Vulnerable populations: The town has an elementary school and six child care operations. The town does not have a senior center/nursing home.

Communications: Both fire stations have radios as do all the fire apparatus. All the town trucks and the Emergency Operations Center also have radios. Communication frequency is the Town of Pawlet frequency. Most of the town does not have cell service.

#### **Town Policies and Programs that Mitigate Hazards**

Municipal Plan: The Town Plan was last adopted in February 2, 2016

<u>Opportunities for Improvemet:</u> Town should contract with the Rutland Regional Planning Commission for assistance with the town plan update.

Land Use Bylaws: Adopted January 23, 2017

<u>Opportunities for Improvemet:</u> Planning Commission will be assisted by RRPC for the re-write of the town zoning

Local Emergency Operations Plan: Last adopted on April 11, 2017

<u>Opportunities for Improvemet:</u> Town should collaborate with Emergency Management Planners at Rutland RPC on the LEOP update.

Flood Hazard Area Regulations: Re-Adopted November 2008

<u>Opportunities for Improvemet:</u> The town should continue to work with RRPC to ensure that the regulations are up to date at all times.

River Corridor Regulations: Adopted January 3, 2017 as part of the zoning update

Opportunities for Improvemet: The town should continue to work with the RRPC to discuss options related to this regulation

Road and Bridge Standards: Adopted on March 18, 2014

<u>Opportunities for Improvemet:</u> No improvement needed at this time.

#### **National Flood Insurance Program Compliance**

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

As a participant in the NFIP, a community must adopt regulations that:

- 1. Require any new residential construction within the 100 year floodplain to have the lowest floor, including the basement, elevated above the 100 year flood elevation. The community must maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed;
- 2. Allow non-residential structures to be elevated or dry flood proofed; and
- 3. Require anchoring of manufactured homes in flood prone areas.

The town joined the NFIP in 1978. Currently there are 22 structures in town located in the Special Flood Hazard Area, and 5 of those structures are covered by flood insurance. Two of those structures are critical facilities. There are no structures in town that are deemed by FEMA to be repetitive loss properties. The town's EMD, Robert Morlino, and the Zoning Administrator enforce NFIP compliance.

The town has discussed the following actions as possible actions the Town could take to continue NFIP compliance:

- 1. Distribute literature to residents on flood insurance
- 2. Adopt river corridor protection language in to the flood hazard regulations bylaw.
- 3. Ensure that flood plain and river corridor maps are kept up to date, by requesting mapping assistance from the RRPC.

#### **Other Incentives for Flood Mitigation**

Vermont's Emergency Relief Assistance Funding (ERAF) provides state funding to match federal Public Assistance after federally-declared disasters. Eligible public costs are generally reimbursed by federal taxpayers at 75%, and the State of Vermont will contribute an additional 7.5% toward the costs. For communities that take specific steps to reduce flood risk the State will increase its contribution to 12.5% or 17.5% of the total cost:

12.5% funding for eligible communities that have adopted four mitigation measures:

- 1. National Flood Insurance Program participation;
- 2. Town Road and Bridge Standards;
- 3. Local Emergency Operations Plan; AND
- 4. Local Hazard Mitigation Plan

17.5% funding for eligible communities that also have:

- 1. FEMA's Community Rating System (CRS) participation; OR
- 2. Fluvial Erosion Hazard (FEH) or other river corridor/floodplain protection bylaw that meets or exceeds the Vermont Agency of Natural Resources FEH model regulations and scoping guidelines.

The town currently qualifies for 7.5% ERAF funding since it has completed these actions: Adopted the 2013 road and bridge standards, adopted the town's local emergency operations plan, and joined the National Flood Insurance Program.

#### **Mitigation Actions and Projects**

The town's hazard mitigation committee discussed the mitigation strategy, reviewing projects from the last plan and considering new actions for the town to pursue from the following categories:

- 1. Prevention: Land use bylaws, open space preservation, building codes, etc.
- Property Protection: Acquisition, relocation, elevation, flood-proofing, etc.
- Public Education & Awareness: Website with maps, public outreach programs, real estate disclosures, etc.
- Natural Resource Protection: Green storm water infrastructure, low impact development bylaws, protection of steep slopes, etc.
- Emergency Services Protection: Protect critical 5. facilities, warning capabilities, and infrastructure; generators for critical facilities; etc.
- Structural Projects: Culvert upsizing, bridge upsizing, floodplain restoration, and stream embankment armoring.

The following mitigation actions and projects are future mitigation strategies identified for the community. Note that the municipality will make every effort to maximize use of future Public Assistance Section 406 Mitigation opportunities when available during federally declared disasters.

#### **Mitigation Action Priority Scoring**

Each potential project was considered regarding the benefits it would provide to the town, and the costs required for implementation- resulting in an overall Benefit-Cost Score which is included in the mitigation actions and projects table, with the highest scores indicating the most benefit and least cost. Mitigation actions and projects proposed in this plan should undergo more rigorous benefit-cost analysis by the town before action is taken.

Also, the priority levels indicated in the Mitigation Actions and Projects table take in to account the scores in the Benefit Cost Analysis table, as well as the determination by the hazard mitigation committee of the need for the project. The Benefit Cost analysis table was therefore used as a tool to analyze, discuss, and determine the need and suitability of each project. Therefore, a project may have received a low scoring number in the table, but the committee may have deemed the project important and granted it a high priority.

A project deemed to have a high priority is a project that the hazard mitigation committee identified as: physically possible in the timeframe noted, financially possible with the funding mechanisms noted, and of high importance with regard to hazard mitigation. Projects scored with a medium priority typically were missing one of the attributes identified above, and projects scored as low priority were missing enough attributes to be deemed either low possibility or of low importance.

## Worksheet for Calculating Each Mitigation Action's Benefit to Cost Ratio

#### **Benefits**

Benefits include protection of life and property; increase in public safety; and damage reduction / prevention.

3 = fulfills all benefits listed above

2 = mostly fulfills benefits listed above

1 = fulfills only 1 or 2 benefits listed above

#### Cost

3 = less than \$75.000

1 = Over \$500,000

#### **Implementation**

Consider the technical feasibility as well as the social/political acceptance of the project.

2 = \$75,000- \$500,000 3 = 6 months or less

2 = 6 months to a year

1 = over a year

## **Mitigation Actions and Projects**

#### Vulnerability: Flooding of Bridges and Low Lying Areas

Move the Pawlet Fire House. The Pawlet Fire House sits along the Flower Brook River and is in the Special Flood Hazard Area. The station has flooded and been evacuated twice, including during TS Irene. Moving this critical structure out of the SFHA will help ensure that fire and rescue vehicles are accessible and operational during future flood and storm events.

Who: Town EMD, Fire Dept When: 2019-2022 How: HMGP, VT Structures Grant Priority: High

Raise or Widen the RT 30 Bridge Over Flower Brook. This bridge flooded in TS Irene. The town is interested in having a roundabout installed at this bridge.

Who: Town EMD, Road Foreman, SelectBoard When: 2022 and beyond How: HMGP, VT Structures Grant

Priority: High

Sawmill Rd Bridge

River Rd and Rt 153 Intersection

Move or Raise the Post Office

Generator for Town Hall

Stabilize Wastewater Treatment Site. A major flood of the Flower Brook River could wipe out the wastewater / "septic" of Pawlet Village.

Who: Select Board, Town EMD When: 2020-2022 How: HMGP Priority: High

#### Revise Zoning to require that new development be built to BFE+ 2'.

Who: Select Board. Planning Commission When: 2019 How: RRPC Assistance Priority: Moderate

Revise Zoning to Ensure New Development will not be Vulnerable to Flooding or Frosian. This includes

adopting State River Corridor Protection La	anguage
Who: Select Board. Planning Commission	When: 2019 How: Assistance from RRPC Priority: Moderate
	Table of the Benefit Cost
Project	Benefits  Benefits include protection of life and property; increase in public safety; and damage reduction / prevention.  3 = fulfills all benefits listed above  2 = mostly fulfills benefits listed above  1 = fulfills only 1 or 2 benefits listed above
Relocation of the Pawlet Fire House	3
Raise or Widen the Rt 30 Bridge	3
Stabilize Wastewater Treatment Plant	2
Revise Zoning	3

2 2

3

3

18

**Sawmill Rd.** This road needs a bridge, as there currently is not one in place. The hydraulic study for this project has already been completed..

Who: Town EMD, Road Foreman, SelectBoard When: 2022 and beyond How: HMGP, VT Structures Grants

Priority: Moderate

**Intersection of River Rd and RT 153.** This intersection is frequently flooded, as numerous culverts are undersized (15" instead of 18"), and the Mettowee River runs right along River Road (hence the name).

Who: Public Works Director. Town Manager When: 2017-2019 How: HMGP Priority: High

**Move or Raise the Post Office.** This structure sits along the Flower Brook and Mill River. It flooded during TS Irene.

Who: Town EMD, SelectBoard When: 2022 and beyond How: HMGP Priority: Low

#### Vulnerability: Power Outages

**Generator for the Town Hall.** The town hall is the remaining critical facility that does not have a generator. Supplying this building with one would ensure continuity of town functions during a flood/power outage, and this building could serve as an additional EOC.

Who: Town EMD, SelectBoard When: 2022 and beyond How: HMGP Priority: Moderate/High

#### Analysis for the Mitigation Actions

Cost  3 = less than \$75,000 2 = \$75,000- \$500,000 1 = Over \$500,000	Implementation  Consider the technical feasibility as well as the social/political acceptance of the project.  3 = 6 months or less 2 = 6 months to a year 1 = over a year	Score
1	1	5/9
1	1	5/9
1	1	4/9
3	3	9/9
2	1	5/9
2	1	5/9
1	1	5/9
Pawle <b>1</b> LHMP Adopted July 31, 2018	2	6/9

#### 7 Plan Maintenance Process

This hazard mitigation plan is dynamic. To ensure that the plan remains current and relevant, it is important that it be monitored, evaluated, and updated periodically.

#### Monitoring and Evaluation

The plan will be evaluated and monitored annually at an April Selectboard meeting along with the evaluation of the town's Local Emergency Operations Plan (LEOP). The town Emergency Management Director (EMD) will lead this effort. This meeting will allow the Selectboard and EMD, along with the public, to monitor the town's progress in implementing mitigation actions, identify future activities, and update the plan as needed; as well as evaluate the plan by discussing its effectiveness at accomplishing the mitigation goals identified in it. A large component of this meeting involves having the Selectboard and EMD check in with the lead agencies on each of the identified mitigation actions in this plan to fill out the Mitigation Action Tracker Table below in an effort to monitor the progress made on each project.

#### **Updating**

The State Hazard Mitigation Officer is available to work with the town on updating its plan. Town officials will work to incorporate elements of this hazard mitigation plan into other local planning mechanisms, such as the municipal plan, zoning regulations, flood hazard bylaws, etc. The mitigation actions will be mentioned in these aforementioned plans, and the Planning Commission and Selectboard will ensure that the Town Plan and Zoning bylaws do not negate the mitigation actions of this plan. This plan will be thoroughly updated at a minimum every five years in accordance with the following procedure, which will include revision of all aspects of the plan:

The Selectboard will appoint the EMD to convene a meeting of the hazard mitigation committee. The EMD will chair the committee, and other members should include local officials such as Selectboard members, fire chief, zoning administrator, constable/police chief, road commissioner, Planning Commission members, health officer, as well as representatives of other organizations such as businesses, historical society, etc.

Data needs will be reviewed by the committee, data

sources identified, and responsibility for collecting information will be assigned to members.

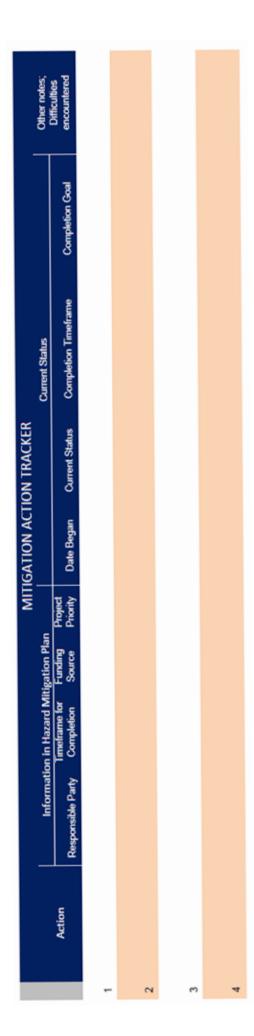
RRPC planners will coordinate with the planning commission and select board when the town rewrites its town plan. RRPC planners will ensure that the mitigation actions from this plan are referenced in the town plan.

#### Continued Public Participation

Maintenance of this plan and implementation of the mitigation strategy will require the continued participation of local citizens, agencies, neighboring communities, and other organizations. To ensure that all relevant parties have the opportunity and means to participate in the planning process, the town will take the below measures to increase citizen participation in hazard mitigation.

The plan will be posted on the town and RRPC websites, with directions to reach out to the town Select Board, town EMD, or RRPC planners with comments or questions.

The Mitigation Actions will be reviewed at Town Meeting, as a way to educate the residents on the hazard mitigation plan and to garner support for the budget for mitiation actions.



# CERTIFICATE OF ADOPTION Town of Pawlet, Vermont Selectboard

A Resolution Adopting the Town of Pawlet, Vermont Local Hazard Mitigation Plan

WHEREAS, the Town of Pawlet has worked with the Rutland Regional Planning Commission to identify natural and human-caused hazards, analyze past and potential future damages due to disasters, and identify strategies for mitigation of future damages; and

WHEREAS, the Town of Pawlet, Vermont Local Hazard Mitigation Plan analyzes hazards and assesses risks and vulnerabilities within the community; and

WHEREAS, the Town of Pawlet, Vermont Local Hazard Mitigation Plan recommends the implementation of actions specific to the community to mitigate against damage from hazard events; and

WHEREAS, the Emergency Management Director will be responsible for annually monitoring and evaluating the Plan, and updating this Plan at least every five years; and

NOW, THEREFORE BE IT RESOLVED that the Town of Pawlet adopts the Town of Pawlet, Vermont Local Hazard Mitigation Plan.

Duly adopted this 31 day of July, 2018

Chair of Selectboard

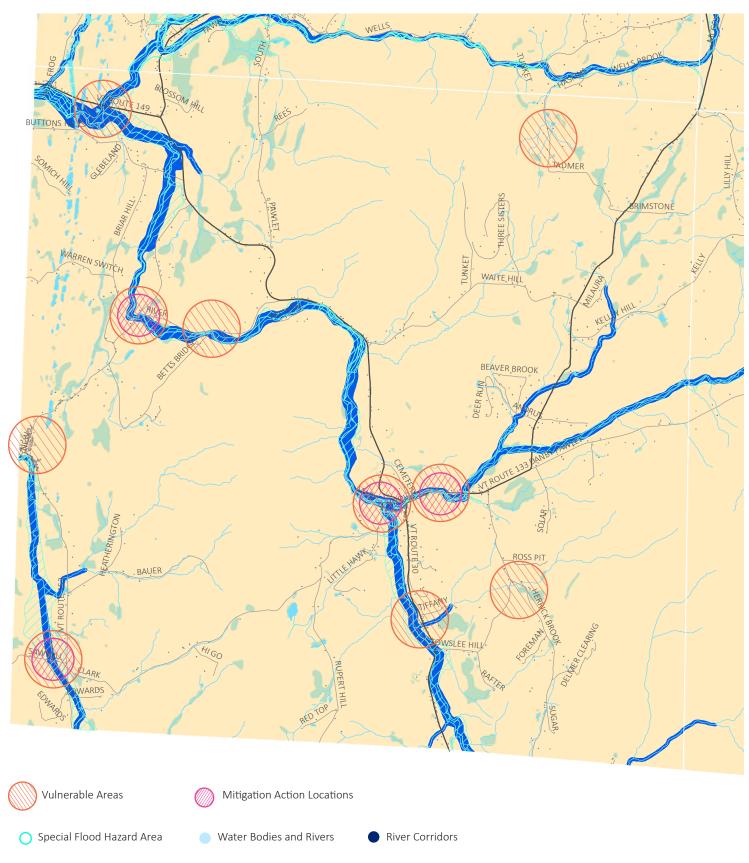
Member of Selectboard

Member of Selectboard

su Clivelay

**ATTEST** 

Town Clerk



#### **Town of Pawlet Local Hazard Mitigation Plan Public Comment Period**

The Local Hazard Mitigation Plan is an all-hazards planning tool that includes mitigation actions and strategies to protect the towns from future flood and storm events. The draft plan is located in the Pawlet Town Office, and the public may provide input through October 20, 2017. Comments may be submitted to Elysa Smigielski at the Rutland RPC: elysa@rutlandrpc.org / 802-775-0871, or to the Pawlet Town Offices.

Sign In Sheet		June 26,2017		
Name	Town	Role in Town	Email	
Robert Morlino	Parlet	EMD	Robert M850 Caol.	
David & Gricards	Pawlet	Constable 1st fire Chief	dprm 594@hotmail.com	
Keith Moon (per phone)	Paulet	Road		

Appendix D: Mitigation Actions from the 2004 Plan

Protect records and human health in Town Office

Status: Complete

Decrease fire risk to Town Office

Status: Complete

Pursue the installation of dry hydrant at Johnson Fuels Service, Inc. to reduce risk from 30,000 gallon LP gas tanks on site.

Status: Complete

Continue to upgrade culverts as needed to accommodate high water flows

Status: Ongoing

Continue to resurface roads, as needed

Status: In progress

Obtain Red Cross Approval for emergency shelters

Status: In progress

Examine current Town Plan and ensure that identified hazard areas and needed strategies are addressed

Status: Ongoing

Flood Proof Town Clerks Office

Status: completed

Examine current zoning and ensure that identified hazard areas are addressed.

Status: This is a maintenance project, not a mitigation action

Incorporate proposed strategies into Annual Budget and Capital Improvement Plan

Status: This is a maintenance project, not a mitigation action

Examine current zoning and ensure that identified hazard areas are addressed

Status: This is a maintenance project, not a mitigation action

Raise awareness within Villages about fire prevention mechanisms that should be put into place such as smoke alarms, sprinkler systems, fire extinguishers etc.

Status: This is a maintenance project, not a mitigation action

<sup>\*</sup> Please note that the priority scores for these actions are not shown here, as the priority ranking system from the 2004 plan is not compatible with the ranking system used in this plan.