Town of Fayston, VT
Local Hazard Mitigation Plan Update
December, 2011

Prepared by the Town of Fayston and CVRPC

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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 community of Fayston 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. 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, avert 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 preventing or limiting development.

2. Purpose

The purpose of this Local Hazard Mitigation Plan is to assist Fayston in recognizing hazards facing the region and their community and identify strategies to begin reducing risks from acknowledged hazards.

Fayston strives to be in accordance the strategies, goals and objectives of the State Hazard Mitigation Plan, including an emphasis on proactive pre-disaster flood mitigation for public infrastructure, good floodplain and river management practices, and fluvial erosion risk assessment initiatives.

The 2011 Fayston Local Hazard Mitigation Plan is an update of the 2009 plan. The plan has been reorganized and new sections have been added regarding:

- Plan Update Process
- Plan Maintenance
- Hurricane/Tropical Storm/Severe Storm Hazard
- Non worst threat hazards
- Updates of Local Areas of Concern Map
- Status update of 2009 mitigation strategies
- Identification of new mitigation strategies

3. Community Profile

The Town of Fayston is located in the southwest quadrant of Washington County. It is bordered by Duxbury to the north, Waitsfield to the east, Warren to the south and the Chittenden County towns of Huntington and Buels Gore to the west. Fayston is characterized by steep mountains and high elevations, the spine of the northern Green Mountains run along the Town's western

boundary, stream tributaries drain into the Mad River, a sub watershed of the Winooski Watershed.

Mt. Ellen, one of the prominent peaks in the Green Mountain Range, is the town's highest peak at 3,700 ft. Fayston's mountainous terrain is home to two of Vermont's major downhill ski areas: Sugarbush's Mount Ellen and Mad River Glen. The town's lowest point is a 700 ft where Shepherd Brook flows into the adjacent town of Waitsfield. Due to steep topography and poor shallow soils commercial and residential development has been limited to the lower elevations areas near and along the Waitsfield town line and around the ski area base areas.

According to the Fayston Town Plan, 2008, Fayston is a rural community with 1,200 full-time residents and 1,000 part-time residents. It is the second fastest growing town in Washington County. Between 1960 and 2010 the population grew from only 158 residents to 1,353. According to the Town Plan it is very likely that the demand for development in the near future will be similar to what has been built over the last five years: single-family homes on several acres or more. No new major residential or commercial developments are planned for Fayston; however, there is a permit in place for a wilderness therapy camp, which concerns some residents regarding fire dangers.

The majority of Fayston's transportation network consists of Class 3 town highways. Fayston is served by three collector highways: Route 17, which traverses the Appalachian Gap and provides access from the Mad River Valley to Chittenden and Addison County on the west side of the Green Mountains. German Flats Road and North Fayston Road are also collector highways. Traffic on these roads increase dramatically on the weekends and holidays due to ski resort traffic.

The major economic activity occurs at the two major ski areas. Much of the residential development has occurred in North Fayston due to its proximity to Route 2 and Interstate 89 to the north and new development is occurring along German Flats Road, Center and North Fayston Roads, Kew-Vasseur and Bragg Hill. The Town Plan recommends that the existing road infrastructure be used for future development and that the overall development pattern enhance Fayston's rural character. This rural character limits land uses and densities in outlying areas and high elevations and instead encourages appropriate clustered or concentrated patterns of development.

Green Mountain Power and Washington Electric provide electricity to the Town of Fayston. Residents and businesses rely on individual or small-scale community wells and springs for their water supply and private waste water treatment systems. The Town's Wastewater Ordinance regulated all disposal systems up until July 2007 now the State of Vermont over see's all waste water permitting.

Fayston contracts with other area governments to provide emergency services for the town. Fayston has an agreement with the Town of Waitsfield for fire protection. According to the *Annual Report of the Town Officers and School Directors of Fayston Vermont for the year ending December 31, 2009* the volunteer department responded to 81 calls in the Mad River Valley, of all calls received 35.8% where from Fayston. Police protection is provided by the Vermont State Police.

The volunteer Mad River Valley Ambulance Service (MRVAS) is responsible for ambulance service in Fayston and according to the town report the MRVAS answered 420 calls in 2009, 85 calls from Fayston.

The Town Plan, adopted in 2008, includes goals, objectives and implementation strategies which support hazard mitigation, as referenced in Section 6 of this plan. The 2004 Zoning Ordinance limits development within the Forest District and the Soil and Water Conservation District for the purpose of protecting forest resources and headwater streams and to prevent development in areas with steep slopes, shallow soils, wildlife habitat, fragile features, scenic resources and poor access to town roads, facilities and services. A new set of regulations is in the final draft stages.

The Town is enrolled in the NFIP and has adopted stream buffer standards which limit development within 50 ft of waterways. Plus the Flood Hazard Overlay (FHO) District was created "to protect public health, safety, and welfare by preventing or minimizing hazards to life and property due to flooding and to ensure that private property owners with designated flood hazard areas are eligible for flood insurance under the National Flood Insurance Program." The FHO zoning regulation also includes a warning that "areas located outside this mapped district may also be subject to periodic or occasional flooding."

Municipalities within Washington County Vermont are currently reviewing new Digital Flood Rate Insurance Maps. It is anticipated the new maps will be adopted by as soon as they are released. As part of this process municipalities will be required to review and update their existing flood bylaws to improve floodplain management in the community.

4. Planning Process and Maintenance

4.1 Planning Process

The Central Vermont Regional Planning Commission (CVRPC) coordinated the Fayston Local Hazard Mitigation Plan process. CVRPC contacted the Town Clerk, Patti Lewis, and sent Town-Specific hazard mitigation material for review. After assessing the material, Patti Lewis and CVRPC staff held a meeting along with members of the community on September 26, 2011 at the Municipal Offices. The Fayston Hazard Mitigation Meeting focused on assessing past mitigation projects and compiling information on its current and future hazard mitigation programs, projects and activities.

Preparation for the meeting included a review of the Fayston Town Plan, Fayston Rapid Response Plan, 2010 Town Report, Mad River Corridor Plan, and State Forest Management Plan. The Fayston Hazard Mitigation Meeting focused on assessing past mitigation projects and compiling information on its current and future hazard mitigation programs, projects and activities.

Attendees included:

- Robert Vasseur – Selectman
- Patti Lewis – Town Clerk and Town Treasurer
- Allen Tinker – Emergency Management Director
- Chuck Martel – Planning Commission

- Carol Chamberlin – Zoning Administrator
- Alfred Gilberts – Planning Commission
- David Koepele – Planning Commission
- Geoff Slater – Planning Commission
- Polly McMurty – Planning Commission
- Jared Cadwell – Selectboard

The meeting indicated that the Town is most vulnerable to avalanche/landslide, flooding/flash flooding/fluvial erosion, wild fire/forest fire, hurricane/severe storms. Previously identified hazards include winter storm/ice storm. Fayston is now focusing on flooding and fluvial erosion hazards as these events are the most common and most destructive.

Once the draft was updated, CVRPC placed a notice for public comments of the draft update on the CVRPC blog and newsletter. The draft update was also available was at Fayston Municipal offices and by request from CVRPC for public review and comments from November 7, 2011 to December 5, 2011. The announcement of the draft update in the CVRPC newsletter reached over 150 people and businesses in the Region's 23 towns, including the adjacent towns of Warren, Waitsfield, Duxbury, and Moretown. No comments were received by CVRPC or Fayston Staff. Public comments submitted, in the future, will be reviewed by the Town Clerk (and CVRPC Staff dependant on funding) and attached as an appendix. In the future, the draft plan will be made available during Town Meeting Day and local meetings with State and local officials to allow for more public comment and review. Once the plan is conditionally approved by FEMA, the plan will go before the Select Board for adoption.

4.2 Plan Update Process

The Fayston Local Hazard Mitigation Plan was originally adopted by the Town as an Annex to the Central Vermont Regional Local Hazard Mitigation Plan in March 2009 and received FEMA conditional approval in July 2010. The Plan was not adopted until after the expiration of the CVRPC Regional Mitigation Plan and therefore never received FEMA final approval. The 2011 update is intended to be submitted as a standalone Town Local Hazard Mitigation Plan.

The current plan is an overhaul of the 2009 plan. Below is a list of the revisions that have been made from the past plan and the appropriate sections for reference. New hazards identified include hurricane/severe storms.

General Updates

- General reorganization/restructuring of the plan according to future FEMA/VEM checklist
    - New sections added – 4.2 Plan Update Process, 4.3 Plan Maintenance, 5.2 Severe Storms, 5.3 Non Worst Threat Hazards
- Update of all data and statistics using 2010 Town Report and US Census Data (Section 3)
- Revaluation, identification and analysis of all significant hazards (Section 5)
- Acknowledgment of implemented mitigation strategies since 2009 – see matrix below (section 4.2)

- Identification of on-going mitigation projects and strategies – see Existing Mitigation Programs, Projects and Activities section (section 4.2)

Hazard Analysis Updates (Sections 5 and 6)

- New hazards added – hurricane/severe storms
- Added location/vulnerability/extent/impact/likelihood table for each hazard to summarize hazard description (Section 5.1-5.3 – after each hazard)
- Review of Vermont Hazard Mitigation Plan (Section 5 – hazard analysis table)

Maps

- Review of 2009 Areas of Concern map and Local Hazards Analysis map – added additional flooding areas and forest layer

The following chart provides an overview of Fayston's proposed 2009 hazard mitigation actions along with their current status. Planning mitigations strategies adopted since the 2009 plan was a revised 2010 flood hazard bylaw.

2009 Mitigation Action	2011 Status
Re-engineer Number Nine Road to decrease probability of landslide.	Ongoing conversations with VTrans District 6 – Town is still interested, but no funding is available
Upsize culverts, especially those considered in poor condition, located along German Flats road, to decrease impacts of flash flooding.	Replaced 10 culverts with 1 needing replacement after Irene
Implement a Fire Notification System in the event of a wild fire.	Lack of interest – won't occur until after fire season
Ensure on-going communication with Sugarbush and Mad River Glen Ski Areas on Emergency Planning & Operations.	Interested – will encourage both parties to attend meetings regarding mitigation plan updates every September

Existing Hazard Mitigation Programs, Projects & Activities

The ongoing or recently completed programs, projects and activities are listed by mitigation strategy.

<u>Community Preparedness Activities</u>

- Basic Emergency Operations Plan, 2009
- Capital Project Budget

Insurance Programs
- Participation in NFIP

Land use Planning/Management
- Fayston Town Plan, 2008
- Town of Fayston Land Use Regulation, 2004 – adoption of updated regulations in final stages
- Town of Fayston Subdivision Regulations, 2002
- Flood Hazard Bylaws - updated 2010

Hazard Control & Protective Works of Infrastructure and Critical Facilities
- Maintenance Programs (Culvert Inventory) – every 3 years
- Dry Hydrants – 5
- Emergency Shelters (backup generator at Town Offices) – Fayston School or GMVS (not Red Cross approved); Waitsfield has shelters as well

Public Awareness, Training & Education
- School Fire Safety Program
- School evacuation plan

4.3 Plan Maintenance

The Fayston Local Hazard Mitigation Plan will be updated and evaluated annually at a September Select Board meeting along with the review of the Basic Emergency Operations Plan. Updates and evaluation by the Select Board will also occur within three months after every federal disaster declaration and as updates to town plan/zoning and river corridor plans come into effect. The plan will be reviewed by the Select Board, Town Clerk and public at the above mentioned September select board meeting. CVRPC will help with updates or if no funding is available, the Town Clerk and Select Board will update the plan.

The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice in the municipal building, Valley Reporter and CVRPC newsletter and blog inviting the public to the scheduled Select Board (or specially scheduled) meeting. Additional stakeholders invited to the meeting will be Sugarbush and Mad River Glen. Also invited in the future will be the VT Agency of Natural Resources (VT ANR), as they are able to provide assistance with NFIP outreach activities, models for stricter floodplain zoning regulations, delineation of fluvial erosion hazard areas, and other applicable initiatives. These efforts will be coordinated by the Town Clerk.

Monitoring of plan progress, implementation, and the 5 year update process, will be undertaken by the Town Clerk and Planning Commission. Monitoring updates may include changes in

community mitigation strategies; new town bylaws, zoning and planning strategies; progress of implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities. If new actions are identified in the five year interim period, the plan can be amended without formal re-adoption during regularly scheduled Select Board meetings. After a five year period, the plan will be submitted for re-adoption following the process outlined the schematic found in the Attachments section.

Fayston shall also incorporate mitigation planning into their long term land use and development planning documents. It is recommended the Town review and incorporate elements of the Local Hazard Mitigation Plan when updating the municipal plan, zoning regulations, and flood hazard/FEH bylaws. The incorporation of the Local Hazard Mitigation Plan into the municipal plan, zoning regulations and flood hazard/FEH bylaws will also be considered after declared or local disasters. The Town shall also consider reviewing future Mad River Corridor planning documents for ideas on future mitigation projects and hazard areas.

5. Community Vulnerability by Hazard

5.1 Hazard Identification

The following natural disasters were discussed and the worst threat hazards were identified based upon the likelihood of the event and the community's vulnerability to the event. Hazards not identified as a "worst threat" may still occur. Greater explanations and mitigation strategies of non "worst threat" hazards can be found in the State of Vermont's Hazard Mitigation Plan.

Hazard	Likelihood [1]	Community Vulnerability[2]	Worst Threat
Avalanche/ Landslide	Med	Yes	X
Dam Failures	Med	No	
Drought	Low	No	
Earthquake	Low	No	
Extreme Cold/Winter Storm/Ice Storm	High	No	
Flash Flood/Flood/Fluvial Erosion	High	Yes	X
High Wind	Med	No	
Ice Jam	Low	No	
Hurricane/Severe Storms	Med	Yes	X
Structure Fire	Low	No	

[1] High likelihood of happening: Near 100% probability in the next year.
Medium likelihood of happening: 10% to 100% probability in the next year or at least once in the next 10 years.
Low likelihood of happening: 1% to 10% probability in the next year or at least once in the next 100 years.

[2] Does the hazard present the threat of disaster (Yes)? Or is it just a routine emergency (No)?

Tornado	Low	No	
Water Supply Contamination	Low	No	
Wildfire/Forest Fire	Med	Yes	X

The Town of Fayston identified the following disasters as presenting the worst threat to the community:

- Avalanche/Landslide
- Flooding/Flash Flooding/Fluvial Erosion
- Hurricane/Severe Storms
- Wildfire/Forest Fire

The Town is interested in focusing a majority of mitigation efforts into reducing impacts from flooding, as the events occur most frequently, severely and cause the most damage to public and private infrastructure.

Non worst threat hazards include:

- Dam Failure
- Extreme Cold/Winter Storm/Ice Storm
- High Winds

A discussion of each significant hazard is included in the proceeding subsections and a map identifying the location of each hazard is attached (See map titled *Areas of Local Concern.*) Each subsection includes a list of past occurrences based upon County-wide FEMA Disaster Declarations (DR-#) if available, plus information from local records, a narrative description of the hazard and a hazard matrix containing the following overview information:

Hazard	Location	Vulnerability	Extent	Impact	Likelihood
Type of hazard	General areas within municipality which are vulnerable to the identified hazard.	Types of structures impacted	Minimal: Limited and scattered property damage; no damage to public infrastructure contained geographic area (i.e., 1 or 2 communities); essential services (utilities, hospitals, schools, etc.) not interrupted; no injuries or fatalities. Moderate: Scattered major property damage (more than 50%	Dollar value or percentage of damages.	High: 10% to 100% probability within the next year or at least once in the next 10 years. Medium: less than 10% to 100% probability within the within the next year or less than once in the next 10

			destroyed); some minor infrastructure damage; wider geographic area (several communities) essential services are briefly interrupted; some injuries and/or fatalities. Severe: Consistent major property damage; major damage to public infrastructure (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and fatalities.		years.

5.2 Worst Threat Hazards

Flooding/Flash Flooding/Fluvial Erosion

History of Occurrences: (Mad River Valley encompasses the towns of Waitsfield, Warren and Fayston)

Date	Event	Location	Extent
8/28/2011	Flash Flood (TS Irene)	Fayston; Washington County	Mad River flood gauge at 19.07 feet; 10.07 feet above flood stage (flood stage is 9 feet)
5/20/2011	Flash Flood	Washington County (No Fayston impact)	4" of rain
3/6/2011	Flood; ice jams	Fayston; Washington County	1-2" of rain followed by ~15" of snow
10/1/2010	Flood	Washington County (no Fayston impact)	
8/2/2008	Flash Flood	Washington County (Mad River Valley)	Mad River gauge at 7.89 feet
7/15/2008	Flash Flood	Washington County; no Fayston impact	3-6" of rain in 2 hrs
3/15/2007	Flood; ice jams	Mad River Valley – no Fayston Impact	
12/24/2003	Flood	Mad River Valley	Mad River flood gauge at 14.17 feet
12/17/2000	Flood	Mad River Valley	3" of rain
6/27/1998	Flash Flood	Mad River Valley	3-6" of rain over 2 day period – Mad River flood gauge at 14.13 feet
8/6/1995	Flood	Mad River Valley	Mad River flood gauge at 8.12 feet
3/31/1987	Flood	Mad River Valley	Mad River flood gauge at 11.97 feet

3/13/1977	Flood; ice jams	Mad River Valley	Mad River flood gauge at 13.72 feet
8/10/1976	Flood	County Wide	Mad River flood gauge at 13.47 feet
9/22/1938	Flood	County Wide	Mad River flood gauge at 16.34 feet
11/03/1927	Flood	County Wide	Mad River flood gauge at 19.40 feet

Flooding/flash flooding/fluvial erosion is Fayston's most commonly recurring hazard. Flooding is the overflowing of rivers, streams, drains and lakes due to excessive rain, rapid snow melt or ice. Flash flooding is a rapidly occurring flood event usually from excessive rain. Fluvial erosion is the process of natural stream channel adjustments. Fluvial erosion causes erosion of sediment in some areas, while causing aggradation of sediment in other. Fluvial erosion processes occur more quickly and severely during flood events.

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. Development has increased the potential for flooding because rainfall that used to soak into the ground or take several days to reach a body of water now quickly runs off streets, parking lots and rooftops and through human-made channels and pipes.

Fayston is located within the Mad River Watershed, a sub watershed of the Winooski Watershed. Most of the land is composed of steep hillsides, terraces, ridgelines and narrow valley bottoms. Ninety-five percent of Fayston's landscape has slopes greater then 15%. Fayston is drained primarily by Shepherd Brook in North Fayston and Mill Brook in South Fayston, two of the Mad River's largest tributaries. Physical constraints such as steep slopes, high elevations and poor soils limit development potential. Fayston has very limited commercial activity which is concentrated along Route 17 and adjacent to the ski resorts. Residential development is widely distributed.

Fayston participates in the FEMA NFIP and has adopted flood hazard regulations to regulate development in the NFIP floodplain. The Flood Rate Insurance Maps the 100-year floodplain along Mill Brook from the Waitsfield-Fayston Town line to 3-miles upstream. Based on the results of overlaying Fayston's current Flood Insurance Rate Maps (FIRM) with the location of E911 points, 9 structures and 64 properties are located within the National Flood Insurance Program's designated 100-year floodplain. The estimated loss for a severe flooding event for all properties located within the town's 100-year floodplain is approximately $12,886,400. There are no FEMA repetitive loss properties in Fayston.

The Fayston Flood Hazard Overlay District prohibits new structures, expects those required for flood control or stream management, within the district. It should also be noted that FEMA has produced updated digitized floodplain maps for Washington County; these updates are currently being reviewed by municipalities and are intended to replace previous floodplain maps by September 2010. The Town Plan recognizes the shortcomings of solely relying on the NFIP maps as

they do not map all areas of possible flooding due to new development, localized drainage, or the effects of stream channel erosion during flooding events. Fayston's zoning regulations also include stream buffers of 50 ft. Development is limited within the vegetated buffer and it's purpose is to prevent soil erosion, protect wildlife habitat and maintain water quality. There are 9 properties in the fluvial erosion hazard zone. The estimated loss for a severe flooding even for all properties located in the FEH zone is $1,812,150.

Fayston experiences damages from flooding events outside of the NFIP mapped 100-year floodplain. Localized heavy rainstorms inundate small mountain streams and tributaries creating fast-moving water that carries rocks, mud, and other debris. In addition, erosion caused by flooding undermines stream banks, mountain sides and road beds. The effects of these events are compounded by the failure of infrastructure such as undersized and/or blocked culverts.

The worst anticipated flooding is unknown in the low lying areas in Town of Fayston. The worst flooding event in Fayston's recorded history occurred in 1927, followed closely by T.S. Irene in 2011. The Mad River flood gauge readings during these events were 19.4 and 19.07, respectively. Detailed historical records relating to the extent of the 1927 flood in Fayston are lost; however, during T.S. Irene up to 4 feet of flooding occurred in Fayston. Lesser but more regular flooding occurs in Fayston, with generally 1 -2 feet of flooding in low lying areas every two or three years. In the future, Fayston can better gather data for flooding extent by having individuals call in flood levels in areas around the Town.

Fayston incurred damages from flooding during the spring 2011 floods and Tropical Storm Irene. Culverts on the following roads were damaged: German Flats, Reinken, Center Fayston, Moulton, Old Mansfield, Fenn, Tucker Hill and Fayston Farms. Damages to culverts, bridges and road surfaces from these two events cost upwards of $250,000. The Town is looking to replace damaged culverts with upsized culverts. The Town is also interested in having private landowners take responsibility for driveway culvert maintenance and upsizing.

The areas of local concerns map (attached) identifies areas that have experienced flash flooding in the past. The following matrix provides an overview of the hazard:

Hazard	Location	Vulnerability	Extent	Impact	Probability
Flooding	German Flats Rd, Rankin Rd, Center Fayston Rd, Moulton Rd, Old Mansfield Rd, Phen Rd, Tucker Hill Rd, Fayston Farms Rd	Culverts, bridges, road infrastructure	TS Irene - ~6" of rain, Mad River flood gauge at 19.07 feet; 9 ft is flood stage	Over $250,000 from 2011 events; ~$13 million in floodplain properties	High

Hurricane/Tropical/Severe Storms

History of Occurrence: (Mad River Valley encompasses the towns of Waitsfield, Warren and Fayston)

Date	Event	Location	Extent
8/28/2011	Tropical Storm, Flash Flood (TS Irene)	Fayston; Washington County	Mad River flood gauge at 19.07 feet; 10.07 feet above flood stage (flood stage is 9 feet)
7/06/2011	Thunderstorm	Washington County	50 knot winds; 15,000 people in VT lost power
5/26/2011	Hail/Thunderstorms/Flash Flooding	Fayston; Washington County	1" hail, 25,000 customers lost power in VT, 3-5" of rain
8/9/2010	Thunderstorm/Wind/Hail	Fayston	50 knot winds
7/21/2010	Hail	Washington County (Mad River Valley)	1" Hail
7/18/2008	Hail	Mad River Valley	1" Hail, 30 knot winds
7/9/2007	Hail, thunderstorms	Mad River Valley	Baseball sized hail
7/1/2006	Hail, thunderstorms	Mad River Valley	1" Hail, severe t-storms
9/29/2005	Severe thunderstorms	Mad River Valley	Downed trees and power lines, 35 knot winds
9/16/1999	Tropical Storm Floyd	Statewide	Tropical storm winds and flooding
7/22/1999	Hail, Thunderstorms	Mad River Valley	1.5" hail, severe t-storms
6/17/1998	Severe Storms	County Wide	
7/15/1997	Severe Storms	County Wide	
5/19/1982	Thunderstorm winds	County Wide	56 knot winds
7/3/1964	Hail	County Wide	1.5" hail
9/22/1938	Hurricane	Statewide	Category 1 force winds

Hurricanes and tropical storms are violent rain storms with strong winds that have large amounts of rainfall and can reach speeds up to 200 mph. Hurricane season is between the months of June and November. These types of storms originate in the warm waters of the Caribbean and move up the Eastern seaboard where they lose speed in the cooler waters of the North Atlantic. Severe storm events can occur late spring and early summer as temperatures increase in the summer season. The frequency and intensity of hurricanes, tropical storms, and severe storms is expected to increase with climate change.

Similar to flooding, the extent of severe storms is not well documented in the Town of Fayston. The impact of storms is usually flood related. See flood extent description in flood section above. Wind extent from storms is not well documented as there is no monitoring station in Fayston.

Estimates for wind are gathered from county wide data off the NCDC website. In the future, Fayston could consider installing a monitoring station on the Mad River and other major brooks, or training staff as spotters to better gather data for wind and flood events.

On Aug 28, 2011, Tropical Storm Irene hit Vermont and proceeded to deposit 4-5" of rain over Fayston. Total damages from the storm have not yet been calculated, but damages from Irene already exceed $150,000. Roads that received the greatest damage were German Flats Rd and Route 17. These roads typically experience flooding during extreme rain events and were similarly damaged in the spring 2011 floods, but to a lesser extent. Culverts on German Flats Rd were previously upsized and replaced prior to Irene. One had to be replaced after Irene. Roads damaged in Irene are now open, but still need permanent repairs.

The Town is now focusing on upsizing all culverts up to new State standards and having hydraulic studies performed on culverts that are repeatedly flooding. Wind during Irene was not a problem; however, high winds can knock down trees and power lines causing power loss.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Hurricane/ Tropical/ Severe Storms	Town Wide for Wind impacts, German Flats Rd	Large trees, power lines, culverts/ bridges	~6" rain – TS Irene ; Mad River flood gauge at 19.07 feet; 9 ft is flood stage	Data gap – depends on severity $250,000 from Spring 2011 events	Medium

Landslide

History of past occurrences:

- July 14, 1897 – Slide Brook landslide

A landslide is the sliding of a large mass of rock material, soil, etc., down the side of a mountain or cliff. Landslides can be caused by rainstorms, fires, alternate freezing or thawing and/or by the steepening of slopes by erosion or human modification.

In 1897 Fayston experienced a great landslide on the east side of Lincoln Mountain. According to Fayston's Historic Sites and Homes Tour quoted in the Town Plan "after a copious shower which lasted the whole night and most of the early morning, a heavy roaring sound was heard for a long distance and for a long time. Those living near "Slide Off Brook" soon saw a tremendous mass of floating trees, rock and mud coming down the stream. It cleared a wide channel in its course as it went on its way with a resistless current."

Currently Number Nine Road is being undermined by any one of the previously listed causes. The surficial geology of this area primarily consists of the thin till, which is a layer of mixed material that was laid down by glacial ice. Number Nine Road traverses a 25% grade near the intersection with Route 17 and the municipal road foreman has witnessed a 2-foot drop in the road level in the past couple of years. A sudden rain storm or alternate freezing and thawing could create a landslide

resulting in the loss of a portion of Number Nine Road and extensive property damage to the private residence located down slope.

Several other roads and areas in Fayston are slumping due to erosion and undermining of road bases. These areas are: North Side of Tucker Hill area – under Hoop's house, "dark corner" of North Fayston Rd, area between Rte 17 and Bragg Hill Rd, Piper property on Randall's Rd, section of Mill Brook Trail, hill across from the Hyde Away.

The extents of the above mentioned possible landslide areas are unknown as extensive soil and geological studies have yet to be performed. Historical data for landslides in Fayston is limited. It is not possible to estimate the extent at the given time. For the next plan update, Fayston can monitor the current possible slide areas and further investigate soil and geological maps of the known areas to possibly determine a more precise extent.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Landslide	Number Nine Road, North side of Tucker Hill, Dark corner N. Fayston Rd, between Rte 17 and Bragg Hill Rd, Mill Brook Trail, across from Hyde Away, Randall's Rd	Road infrastructure & private residence located at 891 Mill Brook Road, culverts, bridges, roads, trails	1897 slide – 330 feet average width x 80 feet deep - 4 miles long and 2400 ft drop in elevation	Unknown – data gap	Medium

Wildfire

FEMA indicates there are three classes of wild land fires – surface fires, ground fires and crown fires, with the most common type indicated as a surface fire. Surface fires burn slowly along the forest floor, killing and damaging trees. Ground fires burn on or below the forest floor and are usually caused by lightning. Crown fires move quickly by jumping along the tops of trees. Crown fires can spread quickly during windy conditions.

Approximately 90% or 21,204 acres of Fayston is forested. State and Federal agencies own 3,034 acres and the rest is in private ownership. Despite the absence of recent forest fires of significant size, the volume of the Town's forested landscape in conjunction with dry and windy weather has the potential to rapidly spread fire and create a hazardous situation. While a dry hydrant system does exist in Fayston, much of the forestland is unreachable by road limiting firefighting measures. Private residences, ski resort infrastructure and timber related businesses are all located within forested areas. Additional impacts include loss of wildlife habitat and recreational amenities including hiking, skiing and snowmobiling trails. All impacting the local tourist economy and resident's quality of life.

The Town is now most concerned about a pending permit for a wilderness therapy camp development. The True North development is on a 650 acre parcel on State and Town land. The camp would have 12 new yurt sites and would allow campfires. The Town is concerned because the heavily wooded parcel was previously not used for camping and the Town is worried about an increased fire danger from open campfires.

To date there have been no occurrences of forest fires. State forest areas are identified on the local areas of concern map. The extent of a forest fire has yet to be determined due to limited historical data. For the next plan update, Fayston can work with the US Forest Service and State Forest Agency to develop estimations of extent if a forest fire were to occur.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Wildfire	Town Wide – State and Nat'l Forest land	State and private Forest land. Ski infrastructure, private homes on urban/forest interface	To date – 0 acres; Approx. 21,024-acres of forested area	Unknown –data gap	Medium

5.3 Non Worst Threat Hazards

Extreme Cold/Winter Storm/Ice Storm

History of Occurrences (county wide)
Snow and/or ice events occur on a regular basis during the winter months. Recent significant events have included:

- January, 16 1998 – DR 1201
- December 31, 2000
- March 22-23 2001
- January 4, 2003
- March 7, 2011

A winter storm is defined as a storm that generates sufficient quantities of snow, ice or sleet to result in hazardous conditions and/or property damage. Ice storms are sometimes incorrectly referred to as sleet storms. Sleet is similar to hail only smaller and can be easily identified as frozen rain drops (ice pellets) that bounce when hitting the ground or other objects. Sleet does not stick to wires or trees, but in sufficient depth, can cause hazardous driving conditions. Ice storms are the result of cold rain that freezes on contact with the surfaces coating the ground, tress, buildings, overhead wires and other exposed objects with ice, sometimes causing extensive damage. Periods of extreme cold tend to occur with these events.

One of the major problems associated with ice storms is the loss of electrical power. Major electric utility companies have active, ongoing programs to improve system reliability and protect facilities from damage by ice, severe winds and other hazards. Typically, these programs focus on trimming

trees to prevent encroachment of overhead lines, strengthening vulnerable system components, protecting equipment from lightning strikes and placing new distribution lines underground.

Other major problems include closed roads and restricted transportation.

By observing winter storm watches and warnings, adequate preparations can usually be made to lessen the impact of snow, ice and sleet, and below freezing temperature conditions on the Town of Fayston. Providing for the mass care and sheltering of residents left without heat or electricity for an extended time and mobilizing sufficient resources to clear broken tree limbs from roads, are the primary challenges facing community officials. Fayston should plan and prepare for these emergencies. That planning and preparedness effort should include the identification of mass care facilities and necessary resources such as cots, blankets, food supplies and generators, as well as debris removal equipment and services. Fayston Elementary and Municipal Offices are the town shelters. Additional shelters are located in the neighboring town of Waitsfield.

Hazard	Location	Vulnerability	Extent	Impact	Likelihood
Winter Storm/Ice Storm	Town Wide	Utilities, trees, roads, old/under insulated structures	18+" snow in March 2011 storm, depends on severity	5-10% damages – routine emergencies	High

High Winds

High wind is defined as an event with sustained wind speeds of 40 m.p.h. or greater lasting for 1 hour or longer or an event with winds of 58 m.p.h. or greater for any duration. Thunderstorms can generate high winds and down hundreds of large trees within a few minutes. The State can also experience tornadoes, which are capable of damaging or destroying structures, downing trees and power lines and creating injuries and death from collapsing buildings and flying objects. Tornadoes are less common than hail storms and high winds, but have occurred throughout Vermont. Across the State, however, 34 tornadoes have been recorded between 1950 and 1999, injuring 10 people and causing over $8.4 million dollars in estimated property damage. Nearly all of these incidents occurred from May through August with most of occurring in the afternoon. To date, no high wind events have occurred in Fayston.

Hazard	Location	Vulnerability	Extent	Impact	Probability
High Winds	Town Wide	Power lines, trees, structures	Depends on severity of event	Depends on severity of event	Medium

Dam Failure

Dam failure is when a dam is breeched and possibly causes inundation of downstream properties.

There are no major State dams located in Fayston. The Town is primarily concerned with smaller private pond dams, which could flood adjacent neighboring landowners. A dam failure on Old Mansfield Rd has washed out the road in the past. Damage costs are unknown. Additional private Dams are located on Center Fayston Rd, Otton's Mine, Livingston Rd, Fenn Rd, and Foldger's Pond.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Dam Failure	Old Mansfield Rd, Center Fayston Rd, Otton's Mine, Livingston Rd, Fenn Rd, Foldger's Pond	Private property	Depends on size of dam. Most private dams are fairly small	Depends on size of dam and if severe storms occur	Medium

6. Mitigation

6.1 Town Plan (July 2008) Goals & Objectives that Support Local Hazard Mitigation

- To protect and preserve historic buildings, structures and archeological sites significant to Fayston history. (History Goals & Objectives)
- Minimize the extent to which development occurs in areas subject to natural and/or environmental hazards. (Natural Resources Goals & Objectives)
- Ensure new development and changes to land use activities do not produce undue adverse impacts to the condition and function of the town's transportation system. (Transportation Goals & Objectives)

Fayston's town plan will be updated no later than 2013. The Town in interested in adding goals which related to mitigation planning such as:

- To take actions to reduce or eliminate the long-term risk to human life and property from natural hazards.

Specific hazard mitigation strategies related to goals of the Plan include:

- Ensure existing and future drainage systems are adequate and functioning properly
- Preserve and prevent development in areas where natural hazard potential is high
- Ensure that all residents and business owners are aware of the hazards that exist within Fayston and ways they can protect themselves and insure their property
- Ensure that emergency response services and critical facilities functions are not interrupted by natural hazards

6.2 Identified Hazard Mitigation Programs, Projects & Activities

Hazard mitigation programs, projects and activities that were identified for implementation at the Fayston Local Hazard Mitigation meeting:

Hazards Mitigated	Mitigation Action	Local Leadership	Prioritization (High, Med)	Possible Resources	Time Frame
Flooding, Landslide, Severe Storms	Work with the Pipers/landowners on Randall Rd to install a culvert	P.C, Road Foreman	Med	HMGP Town Funds	3 years
Flooding, Landslide, Severe Storms	Replacement and upgrade culverts on German Flats Rd (6 ft culvert), Reinken Rd, Center Fayston Rd, Moulton Rd (4 ft culvert), Old Mansfield Rd, Phen Rd, Tucker Hill Rd, Fayston Farms Rd	P.C, Road Foreman, VTrans	High	VTrans HMGP	1 year
Emergency Preparedness	Require fire extinguishers at yurt sites on True North Property	S.B., Z.A.	Med	Town	2 years
Flooding, Landslide, Severe Storms	Develop regulations for driveway culverts; have private landowners be responsible for maintenance and upgrades	S.B., P.C., Z.A.	High	Town	2 years
Flooding, Landslide	Provide education for landowners regarding storm water, culverts and low impact development	S.B., P.C., Z.A.	Med	Town	2-3 years
Wildfire	Work with State to develop alternative water supplies in State Forest for wildfire suppression purposes	P.C, Fire Dept, VT ANR	Med	EMGP	3 years
Landslide	Re-engineer Number Nine Rd to decrease probability of landslide	S.B, Road Foreman	High	HMGP	2 years
Wild Fire	Develop public education materials about reducing wild fire risk	Fire Dept, S. B	Med	USDA	3-4 years
NFIP Compliance	Work with elected officials, the State and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through	P.C, ANR, S.B, Road Foremen	Med	Town, USDA	2-3 years

	continuous communications, training and education				

VEM also emphasizes a collaborative approach to achieving mitigation on the local level, by partnering with ANR, VTrans, ACCD, Regional Planning Commissions, FEMA Region 1 and other agencies, all working together to provide assistance and resources to towns interested in pursuing mitigation projects and planning initiatives.

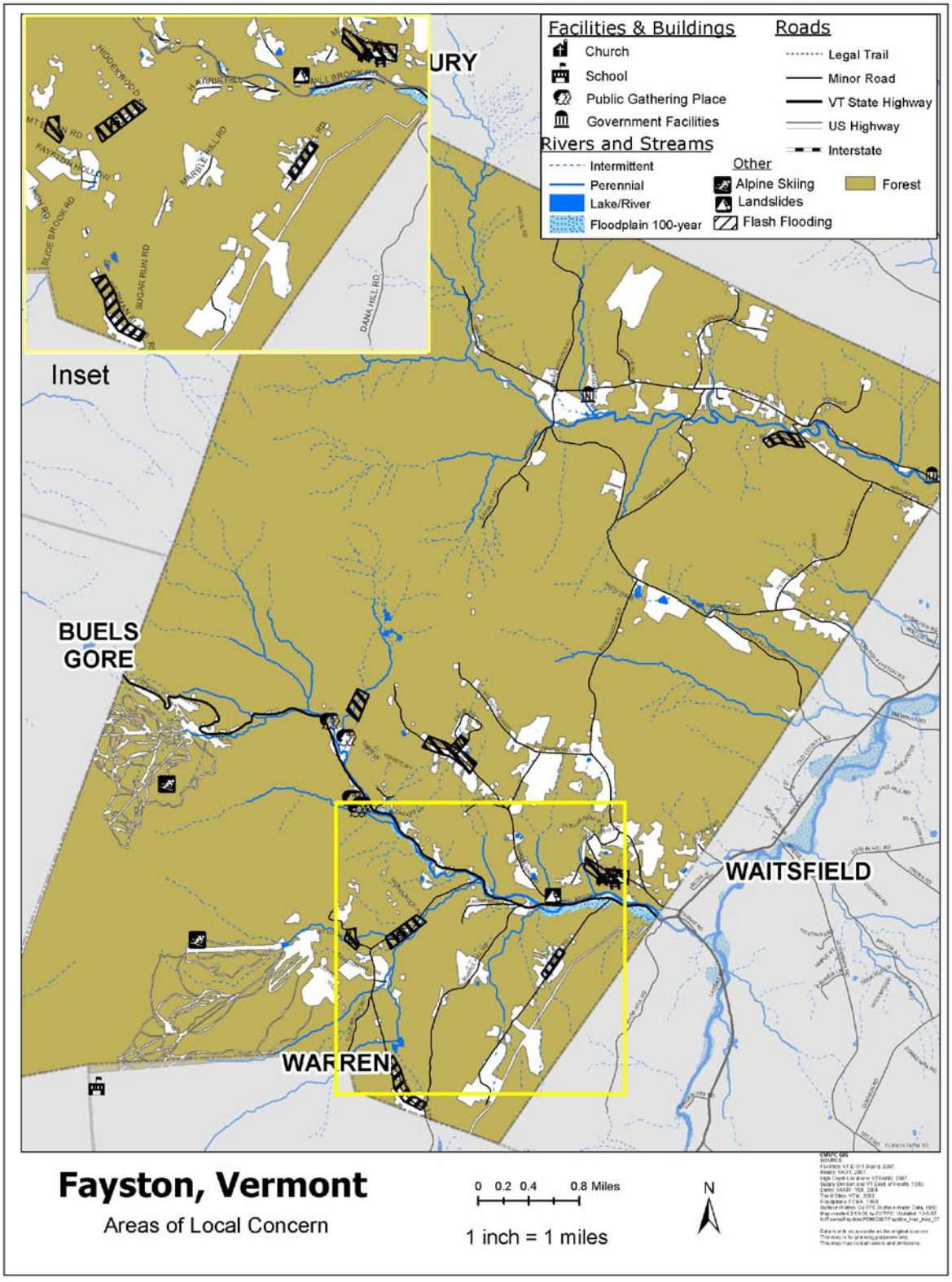
The mitigation activities are listed in regards to local leadership, possible resources, implementation tools, and prioritization. Prioritization was based upon the economic impact of the action, the Community's need to address the issue, the action's cost, and the availability of potential funding. The action's cost was evaluated in relation to its benefit as outlined in the STAPLEE guidelines.

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

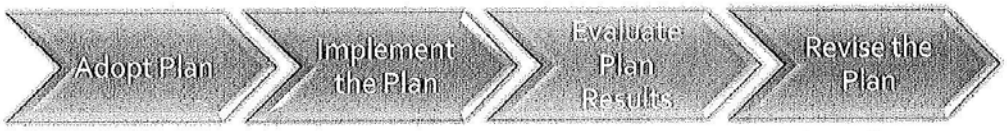
A High prioritization denotes that the action is either critical or potential funding is readily available and should have a timeframe of implementation of less than two years. A Medium prioritization is warranted where the action is less critical or the potential funding is not readily available and has a timeframe for implementation of more than two years but less than four. A Low prioritization indicates that the timeframe for implementation of the action, given the action's cost, availability of funding, and the community's need to address the issue, is more than four years.

Attachments

- Areas of Local Concern Map
- 5 year plan maintenance and review process
- Town Resolution Adopting the Plan


Facilities & Buildings
Church
School
Public Gathering Place
Government Facilities
Rivers and Streams
Intermittent
Perennial
Lake/River
Floodplain 100-year
Roads
Legal Trail
Minor Road
VT State Highway
US Highway
Interstate
Other
Alpine Skiing
Landslides
Flash Flooding
Forest
Inset
BUELS GORE
WAITSFIELD
WARREN
Fayston, Vermont
Areas of Local Concern
0 0.2 0.4 0.8 Miles
1 inch = 1 miles
N

5-Year Plan Review/Maintenance



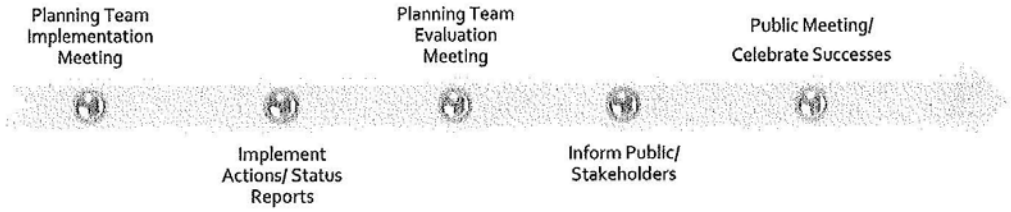
- Brief local leadership on plan approval
- Formally adopt plan
- Publicize plan approval and adoption
- Celebrate success

- Confirm/clarify responsibilities
- Integrate mitigaction actions
- Monitor and document implentation of projects and actions
- Establish indicators of effectiveness or success

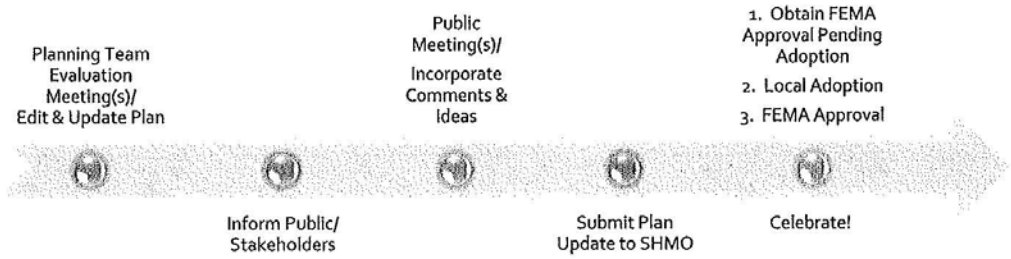
- Effectiveness of planning process
- Effectiveness of actions
- Document success & challenges of actions
- Update and involve community
- Celebrate successes

- Review factors affecting community's context
- Analyze findings; determine whether to revise process or strategy
- Incorporate findings into the plan

After Plan Adoption-Annually
Implement and Evaluate



Fifth Year, and After Major Disaster
Evaluate and Revise



Certificate of Adoption

The Town of Fayston
Select Board
A Resolution Adopting the Local Hazard Mitigation Plan
_____ __, 2011

WHEREAS, the Town of Fayston has worked with the Central Vermont Regional Planning Commission to identify hazards, analyze past and potential future losses due to natural and manmade-caused disasters, and identify strategies for mitigating future losses; and

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

WHEREAS, a duly-noticed public meeting was held by the Town of Fayston Select Board on _____ __, 2011 to formally adopt the Fayston Local Hazard Mitigation Plan;

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

_____
Chair of Select Board

_____
Member of Select Board

ATTEST

_____
Fayston Town Clerk