Clarendon, Vermont
Local Hazard Mitigation Plan

Flash Flooding on Gorge Road - 2019

FEMA Approval Pending Adoption Date: December 8, 2021
Municipal Adoption Date: December 13, 2021
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RUTLAND REGIONAL PLANNING COMMISSION

Other Key Partners
Rutland Natural Resources Conservation District
Western Vermont Floodplain Manager
Vermont Department of Health
Vermont Agency of Transportation District 3 Program Manager

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
RIVERS PROGRAM

VERMONT
DEPARTMENT OF HEALTH

VERMONT
AGENCY OF TRANSPORTATION

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1 INTRODUCTION

The impact of expected, but unpredictable natural events can be reduced through community planning and action. The goal of this Plan is to provide a natural hazards local mitigation strategy that makes Clarendon (the Town) more disaster resistant and more resilient after a disaster.

Hazard Mitigation is any sustained policy or action that reduces or eliminates long-term risk to people and property from natural 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 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 and policies that can be implemented to reduce the severity of the hazard.

2 PURPOSE

The purpose of this Plan is to assist the Town in identifying all natural hazards facing the community, ranking them according to local vulnerabilities, and developing strategies to reduce risks from those hazards. Once adopted, this Plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property.

The benefits of mitigation planning include:

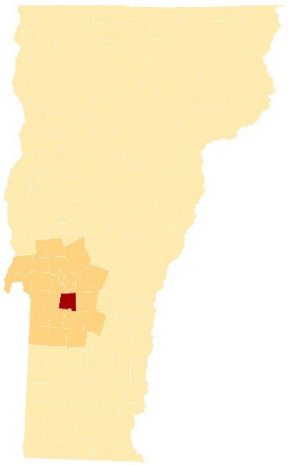
- Reducing the degree of impact and inconvenience to residents and property.
- Identifying actions for risk reduction that are agreed upon by stakeholders and the public.
- Focusing resources on the greatest risks and vulnerabilities.
- Increasing education and awareness of threats and hazards, as well as their risks.
- Communicating priorities to State and Federal officials.
- Aligning risk reduction with other community objectives.

Furthermore, the Town seeks to be in accordance with the strategies, goals, and objectives of the 2018 State Hazard Mitigation Plan.

3 COMMUNITY PROFILE

Land Use and Development Patterns

Clarendon is comprised of five villages: Clarendon, West Clarendon, East Clarendon, Clarendon Springs, and North Clarendon. Split by US Route 7, the Cold and Mill Rivers, Otter Creek, and the Green Mountains, development in Clarendon is largely rural residential with clusters of commercial uses in the villages.



Clarendon is home to the Rutland - Southern Vermont Regional Airport - the region's only commercial airport, and an associated Industrial Park. The airport and industrial park are viewed as significant assets for the region's economy and the source of most new non-residential development in town. Clarendon also has some large industrial uses outside of the industrial park such as stone crushing quarries and sand and gravel pits.

In addition to residential and industrial uses, farming along the Otter Creek floodplain is common and some of the best farmland in our region.

Land Features

Clarendon's landscape has a varying topography. Elevation ranges from 660 feet to 2400 feet. The central area of Clarendon is located on relatively flat land within the Vermont Valley, a narrow valley area between the Taconic Mountains on the west and the Green Mountains on the east. Much of this land consists of prime agricultural soils as well as Class II wetlands due to the three rivers running through it - Otter Creek, Mill River, and Cold River.

Demographics and Growth Potential

The U.S. Census Bureau 2019 American Community Survey Five-Year Estimates shows an estimated population of 2,358 and 1,148 households. From 2010 and 2019, the population declined at a rate of approximately 8% from 2,571 to 2,358. The median age of Clarendon residents is 47.2 - slightly higher than the Vermont median age of 42.8. The portion of the population over 60 is 25%, compared to 28% in Vermont and 23% in the country. The population density of the Town is 81 people per square mile compared to an overall State density of 68.

Clarendon's likely highest growth potential will be construction of residential single family homes given our close proximity to Rutland City and Rutland Town. New industrial development beyond the existing Industrial Park and vacant buildings is not anticipated due to lack of public water and sewer utilities.

Electric Utility Distribution System

Electric service to approximately 1,450 accounts is provided by Green Mountain Power via six circuits. Average annual outage statistics between 2016 and 2020 are summarized in **Table 1**.

Table 1: Power Outage Summary

Average Annual (2016-2020)	
Avg # of times a customer was without power in a year	1.76
Avg length of each outage in hours	3.98
# of hours the typical customer was without power	6.99
2020 only	
Avg # of times a customer was without power in a year	2.14
Avg length of each outage in hours	1.71
# of hours the typical customer was without power	3.67

The longest power outage affecting the greatest number of accounts between 2016 and 2020 was 45.27 hours long and impacted 116 accounts. There was an outage during this time that lasted for 71.69 hours and impacted only 1 account.

Precipitation and Water Features

Average precipitation is 43 inches of rain; with July being the wettest month. Average snowfall is 78 inches; with January being the snowiest month.

The most prominent water feature is Otter Creek – a wide, meandering river flowing north through the middle of Clarendon. Several smaller rivers and streams flow through Clarendon, including the Clarendon, Cold, and Mill Rivers.

Drinking Water and Sanitary Sewer

All properties in Clarendon rely on private springs and drilled wells for potable water. Similarly, most properties are served by private septic systems. Exceptions include the industrial park associated with the airport in North Clarendon, which is served by the Rutland City wastewater system.

Transportation

The major highway corridor through Clarendon is US Route 7 running north to south. Other state highways include Route 7B and Routes 133 and 103. These four roads combine for a total of 14.5 miles through Clarendon. There are 52 additional miles of Class 2 and 3 roads throughout Clarendon.

Several roads have been identified as locally important for use as through-ways, detours, short-cuts, and access to critical facilities such as the fire station, town garage, town office, and school. These are shown in orange in **Figure 1**.

According to the Town's Road Stormwater Management Plan, approximately 48% of the Town's road mileage is hydrologically connected - meaning it is within 100-feet of a water resource (i.e., perennial/intermittent stream, wetland, lake, or pond). Proximity to water resources can make these sections of road more vulnerable to flooding and fluvial erosion.

There are 21 town-owned bridges in the Clarendon highway network, as well as ±596 culverts. Thirteen of the town-owned bridges are part of the VTrans Town Highway Bridge Program. The local road network is maintained by the Town Highway Department whose garage is located on Town Garage Road.

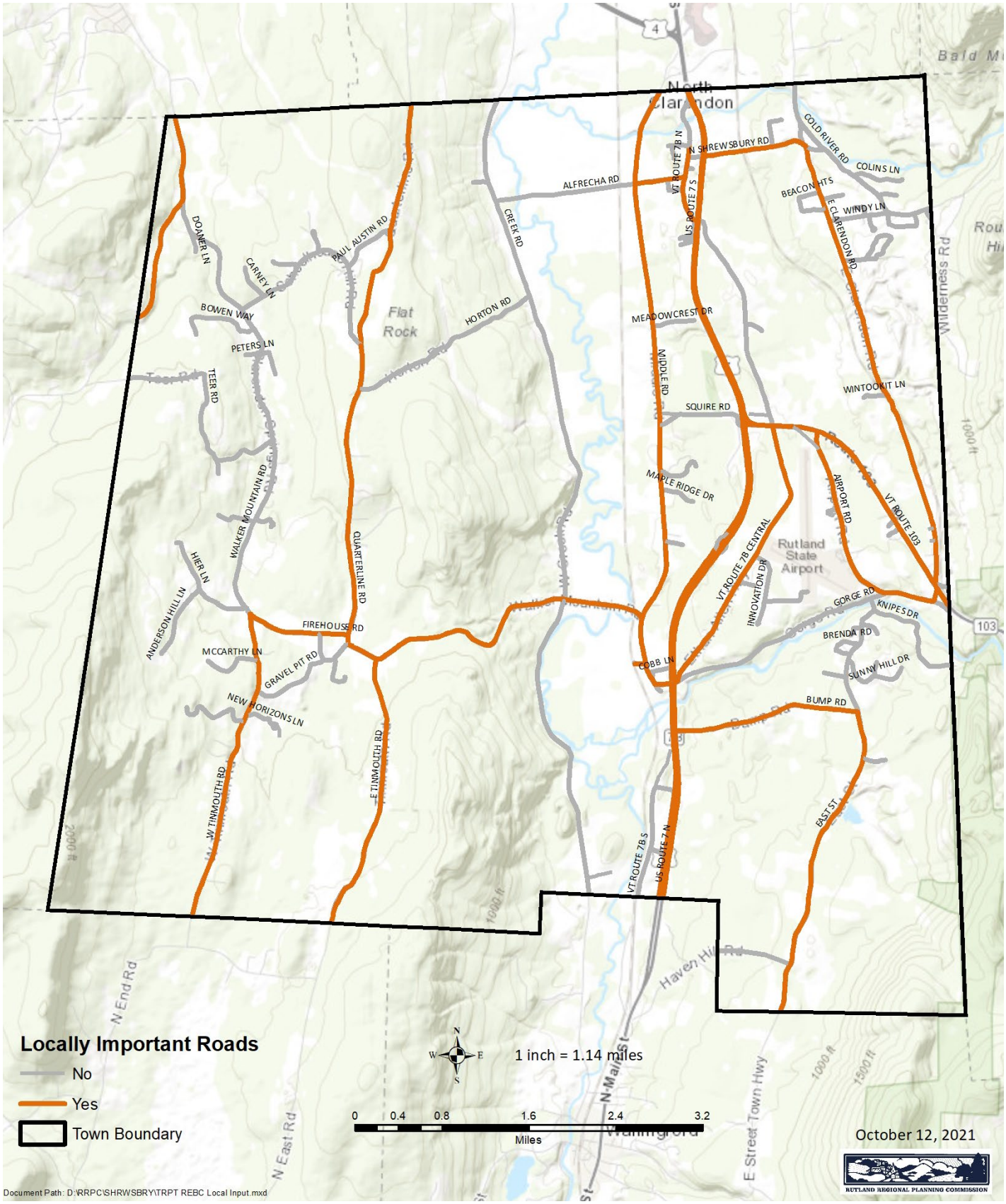


Figure 1: Locally Important Routes for Through-Ways, Detours, Short-Cuts, and Access to Critical Facilities
Shown in orange

Two rail lines pass through Clarendon. One runs along the Otter Creek Valley parallel with US 7 and the other cuts across the Town's northeast corner before becoming parallel with VT 103 and the Mill River Valley.

Public Safety

Fire protection in Clarendon is provided by the Clarendon Volunteer Fire Association, an all-volunteer organization of 26 active members. The association operates out of two fire stations, one in North Clarendon and the other in the Chippenhook neighborhood. The Clarendon Volunteer Fire Association is a member of the Rutland County Mutual Aid Association. Response time is quick to all areas of town including the airport.

Clarendon's law enforcement services are provided primarily by the Sheriff's Department. Its appointed constable and the Vermont State Police provide supplemental assistance as needed.

The nearest hospital is the Rutland Regional Medical Center. Ambulance service is provided by Regional Ambulance Service.

Emergency Management

Clarendon has an appointed Emergency Management Director (EMD) who works with others in town to keep the Local Emergency Plan up-to-date as well as to coordinate with nearby towns and regional emergency planning efforts.

4 PLANNING PROCESS

Plan Developers

Steffanie Bourque, an Emergency Management Planner at the Rutland Regional Planning Commission (RRPC), assisted the Town with updating its Local Hazard Mitigation Plan. Hazard Mitigation Grant Program funds from FEMA supported this process.

The Hazard Mitigation Planning Team members who assisted with the update include the Fire Chief / EMD, Road Commissioner, and Selectboard Administrative Assistant.

Plan Development Process

The 2021 Clarendon Local Hazard Mitigation Plan is an update to the 2016 single jurisdiction mitigation plan. A summary of the process taken to develop the 2021 update is provided in **Table 2**.

Table 2: Plan Development Process

February 18, 2021: Hazard Mitigation Planning Team kick-off meeting. Planning Team members were confirmed. Discussed what a LHMP is; the benefits of hazard mitigation planning; current plan status; the planning process; outreach strategy; and plan sections. Planning Team meetings were not open to the public.

February 2021: Public notice posted on RRPC and Town websites/social media and at the Clarendon Post Office and Transfer Station that the Town is engaged in hazard mitigation planning and updating their LHMP. Emailed notice to officials (Selectboard and Planning Commission chairs, Town Managers and Clerks, Emergency Management Directors) in neighboring towns of Shrewsbury, Wallingford, Tinmouth, Ira, West Rutland, Rutland Town, and Mendon as well as Key Partners (Rutland Natural Resources Conservation District, Western Vermont Floodplain Manager, Department of Health Emergency Preparedness Specialist, VTrans District 3 Program Manager). Notices included instructions to contact the Rutland Regional Planning Commission for more information on the planning process and opportunities for public input. Inquiry received from public regarding potential hazard – see **Appendix D**.

March 18, 2021: Planning Team meeting – confirmed the plan purpose and completed work on the community profile. Began work on the community hazard risk assessment, storm history, and identifying assets vulnerable to the highest risk natural hazards.

April 15, 2021: Planning Team meeting – continued work on the storm history and assets vulnerable to the highest risk natural hazards.

May 18, 2021: Planning Team completed work on the hazard identification and risk assessment. This is a critical milestone in the plan development process and the draft plan was readied for public meeting on May 24.

May 24, 2021: Draft LHMP presented at joint public meeting of the Clarendon Selectboard and Planning Commission to encourage input from local government and the public that could affect the plan's conclusions and better integrate with Town initiatives.

Table 2: Plan Development Process (cont.)

This meeting was recorded and aired on PEGTV. Draft shared with Key Partners for input on vulnerable locations and assets. Draft posted for public comment period with instructions to email comments to Steffanie Bourque. Comments were accepted until June 7, 2021 – see **Appendix D**.

June 10, 2021: Planning Team meeting – discussed comments received on May draft from Selectboard and Vermont Floodplain Manager; completed work on hazard identification and risk assessment. Began work on hazard mitigation strategy – confirmed mitigation goals, discussed community capabilities, and updating the status of 2016 mitigation actions.

July 8, 2021: Planning Team meeting – completed community capabilities; updated status of 2016 mitigation actions; and evaluated range of possible mitigation actions.

August 5, 2021: Planning Team meeting – continued work on hazard mitigation strategy; plan maintenance; and changes since the 2016 plan.

September 2021: Planning Team completed work on the hazard mitigation strategy and draft LHMP finalized for public meeting on September 13.

September 13, 2021: Final draft LHMP presented at joint public meeting of the Clarendon Selectboard and Planning Commission for review and comment. This meeting was recorded and aired on PEGTV. Final draft LHMP emailed to neighboring towns and Key Partners. Plan posted on RRPC and town websites for public comment period with notice of Public Hearing on September 27, 2021 and instructions to email comments to Steffanie Bourque. Comments were accepted until September 27 – see **Appendix D**.

September 27, 2021: Clarendon Selectboard held a Public Hearing at the beginning of their regular meeting to discuss the final draft LHMP and receive comments from the public – see **Appendix D**.

October 11, 2021: Revisions to the LHMP reviewed by the Selectboard and additional revisions requested.

October 25, 2021: Revisions to the LHMP reviewed by the Selectboard and approved submittal for Approval Pending Adoption.

October 27, 2021: Final draft LHMP submitted to Vermont Emergency Management for Approval Pending Adoption.

In addition to the local knowledge of Planning Team members and other relevant parties, several existing plans, studies, reports, and technical information were utilized in the preparation of this Plan. A summary of these is provided in **Table 3.**

Table 3: Existing Plans, Studies, Reports & Technical Information

2021 FEMA NFIP Insurance Reports

2021 Local Emergency Management Plan

2020-2016 Green Mountain Power Outage Data

2019 Road Stormwater Management Plan

2019 American Community Survey Five-Year Estimate

2018 State of Vermont Hazard Mitigation Plan

2016 Clarendon Town Plan

2013 River Corridor Management Plan – Cold River

2011 Zoning & Flood Hazard Area Regulations

2009 River Corridor Management Plan – Mill River

2009 Upper Otter Creek Phase 2 Stream Geomorphic Assessment (SGA)

2006 Upper Otter Creek Phase 2 SGA

RRPC Local Liaison Reports of Storm Damage

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

FEMA Disaster Declarations for Vermont

OpenFEMA Dataset: Public Assistance Funded Project Summaries for Vermont

United States Drought Monitor

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

FEMA Flood Insurance Rate Maps

VTrans Town Highway Bridge Inspection Reports

VTrans Road Flood Resilience Map

VT Statewide Highway Flood Vulnerability and Risk Map

Changes Since the 2016 Plan

Clarendon's Town Plan and land use development regulations aim to guide the direction of growth in a way that is both economically feasible and environmentally acceptable.

As described in the Community Profile section of this Plan, the Town has not experienced any significant change in population or development since 2016.

According to the Clarendon Zoning Administrator, a total of 140 zoning permits were issued in the five years between January 2016 and December 2020. Over 90% of this total (or 128 permits) were for residential applications. Detached accessory storage structures were the most popular application, along with house decks, porches, and additions. This category includes 19 permits issued for new construction or re-construction of single family residences, typically replacing a mobile home with a new manufactured or other type of home construction.

Commercial activity in this period totaled seven (7) permits, mostly for expansion of existing businesses. Two permits were issued for Subdivisions and Boundary Line Adjustments. Miscellaneous approvals were for three (3) agricultural structures for qualified farm operations.

Development in Clarendon since 2016 has not made the community more vulnerable to natural hazards.

The Town's mitigation priorities shifted a bit. In 2016, the Clarendon Local Hazard Mitigation Plan was an all-hazards (natural and human-caused) plan. Floods, fluvial erosion, and severe thunderstorms posed the greatest risks to Clarendon.

The 2021 Plan update focused exclusively on natural hazards defined as atmospheric, hydrologic, geologic, and wildfire phenomena. Hazards not related to the physical environment, such as infectious disease, were excluded from consideration by the Planning Team.

The Town again ranked severe thunderstorms (with associated inundation/flash flooding, fluvial erosion, and high winds) as one of the community's highest risk natural hazards. In addition, they ranked severe winter storms (with associated extreme cold, snow, ice, and high winds) and drought as other highest risk natural hazards.

In 2021, the Town did not formally assess the risks associated with invasive species; however, they did discuss the potential hazards and risks associated with the Emerald Ash Borer (EAB) given the confirmed detection in Rutland County in October 2020. Invasive species were not included in the 2016 Plan.

Clarendon has made progress completing the mitigation projects identified in the 2016 Plan – see **Appendix C.**

Other significant accomplishments include stormwater mitigation projects on Quarterline, Anderson Hill, and Gorge roads and dry hydrants installed at Spencer Farm, Ketchum's Pond, Bowen's Bridge.

Actions taken by Clarendon since 2016 have made the community more prepared and less vulnerable to future natural hazard impacts.

Nonetheless, due to an increase in the frequency and intensity of weather events, the Town remains vulnerable to flash flooding, fluvial erosion, and inundation flooding, high winds, severe winter storms, and drought, as well as invasive species (particularly the Emerald Ash Borer).

As a result, the Town has identified a range of mitigation actions to address flooding, extreme cold/snow/ice, high winds, and drought – see **Table 6**.

5 HAZARD IDENTIFICATION AND RISK ASSESSMENT

Local Vulnerabilities and Risk Assessment

One of the most significant changes from the 2016 Plan is the way hazards are assessed. To be consistent with the approach to hazard assessment in the 2018 State Hazard Mitigation Plan, the Hazard Mitigation Planning Team conducted an initial analysis of known natural hazard events[1] to determine their probability of occurring in the future.

The Planning Team then ranked the hazard impacts associated with the known natural hazard events based on the probability of occurrence and potential impact to life, the economy, infrastructure, and the environment. The ranking results are presented in **Table 4**.

After engaging in discussions, the Town identified the following "highest risk hazards" that they believe their community is most vulnerable to:

- *Flash flooding, fluvial erosion, inundation flooding, and high winds/hail associated with thunderstorms*
- *Extreme cold, snow, ice, and high winds associated with winter storms*
- *Water shortage associated with drought*

Each of these "highest risk hazards" (**orange** in **Table 4**) are further discussed in this section and depicted in the Local Natural Hazards and Vulnerabilities Map in **Appendix B**.

The "lower risk hazards" that are considered to have a low probability of occurrence and low potential impact are not discussed. For information on these hazards, consult the State Hazard Mitigation Plan.

Table 4: Community Hazard Risk Assessment

Hazard Event	Hazard Impacts	Probability	Potential Impact					Score
			Life	Economy	Infrastructure	Environment	Average	
Thunderstorm	**Flash Flooding/ Fluvial Erosion**	**4**	**2**	**3**	**2**	**3**	**2.50**	**10.00**
Ice Jam Tropical Storm/Hurricane Tornado	**Inundation Flooding**	**4**	**2**	**3**	**1**	**4**	**2.50**	**10.00**
	Wind/Hail	**4**	**1**	**4**	**4**	**1**	**2.50**	**10.00**
Landslide	Landslide	1	1	1	1	1	1.00	1.00
Winter Storm	**Cold/Snow /Ice/Wind**	**4**	**2**	**3**	**3**	**2**	**2.50**	**10.00**
Drought	Heat	3	2	2	1	2	1.75	5.25
	Drought	**3**	**1**	**3**	**3**	**2**	**2.25**	**6.75**
Wildfire	Wildfire	3	1	1	1	3	1.50	4.50
Earthquake	Earthquake	1	1	1	1	1	1.00	1.00

*Score = Probability x Average Potential Impact

	Frequency of Occurrence: Probability of a plausibly significant event	**Potential Impact:** Severity and extent of damage and disruption to population, property, environment, and the economy
1	**Unlikely:** <1% probability of occurrence per year	**Negligible:** isolated occurrences of minor property and environmental damage, potential for minor injuries, no to minimal economic disruption
2	**Occasionally:** 1–10% probability of occurrence per year, or at least one chance in next 100 years	**Minor:** isolated occurrences of moderate to severe property and environmental damage, potential for injuries, minor economic disruption
3	**Likely:** >10% but <75% probability per year, at least 1 chance in next 10 years	**Moderate:** severe property and environmental damage on a community scale, injuries or fatalities, short-term economic impact
4	**Highly Likely:** >75% probability in a year	**Major:** severe property and environmental damage on a community or regional scale, - multiple injuries or fatalities, significant economic impact

[1] This Plan defines natural hazards as atmospheric, hydrologic, geologic, and wildfire phenomena. Hazards not necessarily related to the physical environment, such as infectious disease, were excluded from consideration by the Planning Team.

Invasive Species

The Planning Team did not formally assess the risk associated with invasive species; however, they did discuss the potential hazards and risks associated with the Emerald Ash Borer (EAB) specifically.

Vermont's EAB infestation was first detected in 2018 in northern Orange County. In October 2020, a new detection of EAB in West Rutland was confirmed. This is the first confirmed detection in Rutland County, making Clarendon a town in the Confirmed Infested Area for EAB. An inventory of trees within the road right-of-way is needed to determine how many Ash trees are at risk. The potential risk to private woodlots and impacts on the local economy has not been quantified.

Highest Risk Hazard Profiles

Inundation/Flash Flooding/Fluvial Erosion

Floods can damage or destroy property; disable utilities; destroy or make impassable roads and bridges; 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, heat, or communication 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.

As noted in the State Hazard Mitigation Plan, "Flooding is the most common recurring hazard event in Vermont" (2018: 55). There are two types of flooding that impact Vermont communities: inundation and flash flooding. Inundation is when water rises onto low lying land. Flash flooding is a sudden, violent flood which often entails fluvial erosion (stream bank erosion).

Inundation flooding of land adjoining the normal course of a stream or river is a natural occurrence. If these floodplain areas are in their natural state, floods likely would not cause significant damage.

Flooding extent can easily be measured on the Otter Creek with a gauge located in Center Rutland, five miles downstream (north) of Alfrecha Road in Clarendon. Flood stage occurs when the gauge exceeds 8.0 feet, at this level, southern portions of Creek Road flood in Clarendon. At 9.0 feet, water will approach Alfrecha Road. At 11.0 feet and above, additional roads in Clarendon will flood.

While inundation-related flood loss can be a significant component of flood disasters, the more common mode of damage in Vermont is associated with fluvial 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 of naturally occurring unstable stream banks, debris and ice jams, or structural failure of or flow diversion by human-made 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 2018). The town is not vulnerable to ice jams.

Several major flooding events have affected the state in recent years, resulting in multiple Presidential Disaster Declarations. From 2003 to 2010, Rutland County experienced roughly $2.6 million in property damages due to flood events.

The worst flooding event in recent years came in August of 2011 from Tropical Storm Irene (DR4022), which dropped up to 10-11 inches of rain in some areas of Rutland County. Irene caused 2 deaths and $55,250,000 in reported property damages and $2.5 million in crop damages in Rutland County.

Although the storm was technically a tropical storm, the effects of the storms are profiled in this flooding section, since 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, the Otter Creek flood gauge in Center Rutland reach 17.2 feet, a new record. In addition, there was widespread and severe fluvial erosion, especially along the Cold and Mill Rivers.

Damages to municipal infrastructure during Irene were nominal. However, one home was destroyed by a bank failure due to fluvial erosion along the Cold River and a portion of the State-owned US Route 7 bridge was destroyed.

From 2012 to 2020, Rutland County experienced approximately $3.5 million in property damages; with $1.9 million due to a flash flood event in July 2017 (DR4330) and $1 million due to a flash flood event in April 2019 (DR4445).

In Clarendon, flooding is a risk. Damages from flash flooding in April 2019 (DR4445) were significant, resulting in just over $27,000 in damages. In Clarendon, damage due to flooding usually consists of impacts to roads and crop land.

As shown on the Local Natural Hazards and Vulnerabilities Map in **Appendix B**, Clarendon is vulnerable to inundation flooding in the central area of the town, which is located on relatively flat land along the Otter Creek and its floodplain. In this area, South Creek Road, Walker Mountain Road from the railroad tracks to the Creek Road intersection, and the west end of Alfrecha Road are vulnerable to inundation flooding.

Much of the land in the Otter Creek floodplain consists of prime agricultural soils and is actively farmed. So, in addition to impacts to roads, crop land in this area is also vulnerable to flooding.

The only other location vulnerable to inundation flooding is a small section of VT Route 133 along the Clarendon River.

Ten residential dwellings and one commercial property lie in the Special Flood Hazard Area (1% of community structures). According to FEMA, 36% of these properties have flood insurance. In total, these policies cover $1,900,400 in value.

There are <u>no</u> repetitive loss properties.

Flash flooding can impact areas in Town that are located outside of designated floodplains, including along streams confined by narrow valleys. Sections of several roads periodically wash out – Gorge Rd, Quarterline Rd, Teer Rd, Schoolhouse Rd, Clarendon Springs Rd, E Tinmouth Rd, Haven Hill/East St, and Knipes Rd. Flash flooding impacts roads, culverts, and driveways. Impacts can be exacerbated by undersized culverts and inadequate ditching.

Flash Flooding Damage on Quarterline Road - 2019

As shown in **Figure 1**, Walker Mountain, Quarterline, and E Tinmouth Roads are locally important routes for resident commuters and are heavily travelled. When these roads are impacted by flooding, the Road Commissioner coordinates with the Fire Department to close the roads and set up detours. The road closures create longer commute times for residents and longer emergency service response times.

Roads adjacent to critical facilities are not vulnerable to flooding impacts.

In 2018, the Town completed an inventory of hydrologically-connected roads for the Municipal Roads General Permit. This inventory identified areas vulnerable to flash flooding and recommended corrective actions to make these areas more resilient.

Mill River, Cold River, and Upper Otter Creek have undergone Stream Geomorphic Assessment. Work on a portion of Upper Otter Creek in Clarendon was completed in 2006. This assessment recommended a passive approach to river management involving long-term management and preservation of the river corridor.

The 2009 Mill River Corridor Management Plan includes two locations in Clarendon with projects to protect the river corridor, remove berms, and restore the riparian buffer.

South Creek Road is vulnerable to fluvial erosion in the vicinity of the Mill River/Otter Creek confluence.

Fluvial Erosion Along the Cold River – 2011
FEMA Home Buyout on Cold River Road and Streambank Stabilization Project Location

A River Corridor Plan for the Cold River Watershed was completed in 2013. The goal of this planning effort was to provide:

1) A basis for understanding the overall causes of channel instability and habitat degradation along the river corridors in the watershed.
2) A list of preliminary corridor restoration projects to mitigate flood and erosion hazards in the watershed.

The Cold River Plan includes 29 projects to promote the restoration or protection of aquatic habitat. Six projects are in Clarendon. They include adoption of flood erosion hazard zoning, channel restoration, VT Route 7 bridge retrofit, berm removal/relocation, and buffer plantings.

The Town is most concerned about stream deposition reducing the carrying capacity and scouring abutments of a Town-owned bridge (B14) on Middle Road over the Cold River, just west of the VT Route 7 bridge noted above.

Gravel Deposition Under Middle Road Bridge (B14) on Cold River - 2020

Scouring at abutment 2 to B14 due to channel movement from gravel debris upstream was first noted in a 2018 VTrans Bridge Inspection Report. In 2020, VTrans recommended anti-scour protection be placed along abutment 2 upstream.

Gravel Deposition Upstream of B14 - 2020

As weather patterns shift and we see larger storms and more frequent freeze-thaw cycles, the Town will monitor for signs that rivers that have historically been stable becoming less stable, with increased erosion, widening, trees falling in from its banks, etc.

High Wind/Hail

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 more than 50 mph. Thunderstorm winds can cause power and communication outages, transportation and economic disruptions, 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. From 2011 to 2020, thunderstorms resulted in just under $2.4 million in property damage in Rutland County, with $525,000 due to a high wind event in May 2017.

Hail is a form of precipitation composed of spherical lumps of ice. Known as hailstones, these ice balls typically range from ¼ - 2" 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.

Much of the hail activity in Rutland County is scattered and varies in intensity; the resulting damage usually takes form in uprooted trees, downed power and communication lines, and damage to automobiles and crops.

Violent windstorms are possible here; Clarendon is susceptible to high directional winds town-wide. Many storms with high winds result in downed trees, damaged phone and power lines, buildings, and other property. Clarendon is vulnerable to power outages, and they present a potentially significant risk to many residents.

Downed trees are one of the root causes of power outages. Therefore, trees along the roads, within and adjacent to the road right-of-way, present a risk.

All of Clarendon's public buildings/critical facilities are vulnerable to the impacts of power outages, as none have been equipped with back-up power: town office, garage, fire station, elementary and high schools, and local shelters.

The town office serves as the local Emergency Operations Center (EOC). During a disaster, the municipal response is managed from the EOC, this would include all communications – from phone calls to internet browsing and 2-way radio. Connectivity is crucial in times of crisis. Telecommunications are needed for warning systems before disaster, as well as for response during and recover after. Power outages are the main reason for stopping communications, leaving the EOC significantly compromised.

Extreme Cold/Snow/Ice/Wind

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.

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 2001 to 2010, Rutland County experienced $2.7 million in property and crop damages from winter storms. 2011 to 2020 experienced $1.58 million in property damage, with $300,000 due to a 10" - 20" heavy, wet snowfall across the county on December 9, 2014.

There have been four winter storm-related federally declared Disasters in the county (the ice storm of January 1998 – DR 1201; severe winter storms in December 2000 and 2014 – DR 1358 and DR 4207, respectively; and severe storm and flooding in April 2007 – DR 1698).

Typically, towns' vulnerability to snow and ice storms are power outages and loss of road accessibility. As previously described, the Town is not prepared for 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 coincided with a sheltering event.

In general, snow accumulation has not made the Town vulnerable to loss of road accessibility. The Town's fleet of snowplows has ensured that roads are accessible, even in major snow accumulation events. Roads adjacent to critical facilities are the some of the first to be plowed. Areas on Alfrecha, Walker Mountain, Middle, and Firehouse Roads are prone to significant drifting and are maintained accordingly.

Drought

Drought, in the most general sense, is a period of lower-than-average precipitation that results in a water shortage.

It is typically a slow-onset natural hazard that can last for months or years. Drought is a natural part of the climate cycle. Higher temperatures, water demands that exceed availability, low winter snowpack and lack of rainfall are all causes that can lead to a significant drought.

The USDA rates droughts from D0-D4, depending on the severity of the drought, the amount of time it will take for vegetation to return to normal levels, and the possible effects of the drought on vegetation and water supply:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

In addition to the obvious effects on the quantity and quality of drinking water, drought can compromise food and nutrition; increase incidents of illness and disease; and diminish the ability of water ecosystems to properly function.

Municipal water supply and delivery, municipal wastewater, transportation systems, and parks and recreational facilities can be adversely impacted by drought.

There may be situations where water-intensive industries and agricultural production shift to different locations due to lack of water. Other industries directly affected include energy, tourism, and fisheries. The wide-ranging impacts of drought can include job losses, business failures, and lost investments.

When different natural hazards overlap, such as drought and flood, it can lead to cascading hazards, with one event compounding the other. Drought is particularly likely to be part of a cascading hazard because it can cover a large area and go on for a long time.

In the Rutland region, there have been several instances of moderate drought (D1) and one instance in the last 20 years of severe drought (D2). In November 2020, the USDA issued a drought disaster declaration for that crop year.

Drought impacts of concern in Clarendon include the following:

- Interruption of water supply with minor to moderate impacts on drinking water supplies and surface waters for fire suppression.
- Crop and agricultural losses with minor to moderate impacts on maple syrup production and minor impacts on hay production, perennial fruit and orchards, and livestock.

Highest Risk Hazard History

These are the most up to date significant events impacting Clarendon. Federal declarations are depicted in **bold**.

Inundation/Flash Flooding/Fluvial Erosion

8/24/2020: 2-3" rain: no reported local damage
4/15/2019: DR4445 1-2" rain with significant snow melt: $27,083
7/1/2017: DR4330 3-4" rain the previous 3-4 days with flash flooding on 7/1/17: no reported local damages
5/27/2014: heavy rain: $100,000 regional damage
6/25-7/11/2013: DR4140 with heavy rain over multiple days: no reported local damages
8/28/2011: DR4022 Tropical Storm Irene with ±5" rain: $245,000 local damage, including one FEMA buyout and Cold River streambank stabilization project
10/1/2010: heavy rain: $40,000 regional damage
3/23/2010: heavy rain with snow melt (gauge crested at 8.82 ft): $2,000 regional damage
6/12/2007: heavy rain: $20,000 damage to VT Route 103
12/16/2000: DR1358 2-4" rain: $44,640 local damage

High Wind

8/4/2020: TS Isaias 45 mph wind: $25,000 regional damage
6/20/2019: 50 mph wind: $5,000 local damage
5/5/2017: 64 mph wind: $500,000 regional damage
6/23/2013: 55 mph wind: $20,000 local damage
9/8/2012: 60 mph wind: $50,000 regional damage
6/8/2011: 61 mph wind: $20,000 local damage
7/21/2010: 50 mph wind: $25,000 local damage
2/1/2010: 56 mph wind: $250,000 regional damage
8/21/2009: 50 mph wind: $2,000 local damage
8/25/2007: 60 mph wind: $600,000 regional damage

Extreme Cold/Snow/Ice

2/7/2020: 8-12" snow; ¼" ice: $15,000 regional damage
2/1-2/2015: Record cold month with 15 to 20+ days below zero and 12" snow: $10,000 regional damage
12/9/2014: DR4207 10-20" snow: $200,000 regional damage
3/12-13/2014: 8-24" snow and 35-40 mph wind gusts: $20,000 regional damage
12/26/2012: Snowfall rate of 1-2" per hour with accumulations of 8-18": $10,000 regional damage
2/23/2010: 6-30" snow: $200,000 regional damage
4/15-16/2007: DR1698 "Nor'icane" with 3" snow and rain with 60 to 80 mph winds: $3,500,000 regional damage
3/5/2001: EM3167 2-18" snow: $8,700 local damage

Drought

Mar – Apr 2021: D1 drought in 100% of county
11/11/2020: USDA Disaster S4869 2020 Crop Year
Jun – Sept 2020: D1 drought in 50-100% of county
Jun – Sept 2018: D1 drought in 50-100% of county
Sept 2016 – Feb 17: D1 drought in 50-100% of county
Oct – Nov 2016: D2 drought in 60% of county

Vulnerability Summary

Inundation/Flash Flooding/Fluvial Erosion

Location[1]: *Inundation Flooding* – Otter Creek Floodplain; South Creek, Walker Mountain, Alfrecha Roads, VT Route 133
Fluvial Erosion – South Creek Road, Middle Road Bridge
Flash Flooding – Gorge, Quarterline, Teer, Schoolhouse, E Tinmouth, Knipes Roads, Haven Hill/East Street

Vulnerable Assets[1]: Roads, culverts, bridges, driveways, agricultural crops

Extent: ±5" rain; extent data for fluvial erosion is unavailable

Impact: $245,000 local / $100,000 regional damage

Probability: >75% chance in a year

High Wind

Location[1]: Town-wide

Vulnerable Assets[1]: Power lines, telecommunications systems, buildings, trees

Extent: ±64 mph winds

Impact: $25,000 local / $600,000 regional damage

Probability: >75% chance in a year

Extreme Cold/Snow/Ice

Location[1]: Town-wide; Drifting on Alfrecha, Walker Mountain, Middle, Firehouse Roads

Vulnerable Assets[1]: Roads, culverts, bridges, trees, power lines, telecommunications systems

Extent: Up to 30" of snow; ¼" ice; 80 mph winds, 15 to 20+ days below zero

Impact: $8,700 local / $3,500,000 regional damage

Probability: >75% chance in a year

Drought

Location[1]: Town-wide

Vulnerable Assets[1]: Water supplies, natural ecosystems, agriculture

Extent: D2 drought in 60% of county for 2 months

Impact: Data on financial impacts is unavailable

Probability: >10% but <75% chance per year

[1] See **Appendix B:** Local Natural Hazards and Vulnerabilities Map

6 HAZARD MITIGATION STRATEGY

The highest risk natural 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 Planning Team discussed mitigation goals and identified the following as the community's main mitigation goals:

- Reduce or avoid long-term vulnerabilities to identified hazards.
- Reduce the loss of life and injury resulting from these hazards.
- Mitigate financial losses incurred by municipal, residential, industrial, agricultural, and commercial establishments due to disasters.
- Reduce the damage to public infrastructure resulting from these hazards.
- Encourage hazard mitigation planning as a part of the municipal planning process.
- Encourage the adoption and implementation of existing mitigation resources.
- Recognize the connections between land use, stormwater management, road design, 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; existing land use and the capacity of the community to implement them.

Community Capabilities

Each community has a unique set of capabilities, including authorities, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. Clarendon's mitigation capabilities that reduce hazard impacts or that could be used to implement hazard mitigation activities are listed below.

Administrative and Technical

In addition to the Emergency Management staff described in Section 3, municipal staff that can be used for mitigation planning and to implement specific mitigation actions include: Town Administrator, Road Commissioner, Town Treasurer, and Zoning Administrator

In addition to paid staff, there is a 5-member Selectboard, 7-member Planning Commission, Town Health Officer, Town Tree Warden, Town Fire Warden.

To augment local resources, the Town has a formal mutual aid agreement for emergency response – Rutland County Fire Mutual Aid. Technical support is available through the RRPC in the areas of land use planning, emergency management, transportation, GIS mapping, and grant writing. Technical support is also available through the State ANR for floodplain administration and VTrans Districts for hydraulic analyses.

Strengths: coordination between departments is effective ● past success in securing grants for public infrastructure projects ● established maintenance programs for cleaning culverts and roadside ditches as well as tree trimming within road right-of-way

Areas for Improvement: staff are not adequately trained on hazards and mitigation ● few staff perform multiple functions making Town administrative and technical capabilities vulnerable ● Highway Department staff could benefit from training in online mapping and resources

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Examples of planning capabilities that can either enable or inhibit mitigation include land use plans, capital improvement programs, transportation plans, stormwater management plans, disaster recovery and reconstruction plans, and emergency preparedness and response plans. Examples of regulatory capabilities include the enforcement of zoning ordinances, subdivision regulations, and building codes that regulate how and where land is developed, and structures are built.

Strengths: elements of hazard mitigation are included in other plans

Areas for Improvement: capital planning

Zoning Regulations: Adopted February 14, 2011
Description: Promote the health, safety, and general welfare of the people of Clarendon and implement the Clarendon Town Plan.
Relationship to Natural Hazard Mitigation Planning: Establish site plan review requirements and zoning districts with specific standards for proposed development. Requirements are designed to prevent overdevelopment; to mitigate the negative impacts to the natural and human environment; and minimize effects to the historical and aesthetic character of the community.

Flood Hazard Area (FHA) Regulations: Adopted June 9, 2008
Description: Apply to all areas in the Town identified as areas of special flood hazard.
Relationship to Natural Hazard Mitigation Planning: Ensures the design and construction of development in flood and other hazard areas are accomplished in a manner that minimizes or eliminates the potential for flood loss or damage to life and property.

Road and Bridge Standards: Adopted on September 23, 2019
Description: Provide minimum codes and standards for the construction, repair, and maintenance of all town roads and bridges.
Relationship to Natural Hazard Mitigation Planning: The standards include management practices and are designed to ensure the safety of the traveling public, minimize damage to road infrastructure during flood events, and enhance water quality protections.

Fire Department ISO Rating: Issued in 2021
Description: The Clarendon Fire Department's ISO rating is 9. This rating is a score from 1 to 10 that indicates how well-protected the community is by the local fire department.
Relationship to Natural Hazard Mitigation Planning: Everyone wants to keep family, home, and business safe from fires. The ISO rating is a measure of the effectiveness of a community's fire services.

Municipal Plan: Adopted June 13, 2016
Description: A framework for defining and attaining community aspirations through public investments, land use regulations, and other implementation programs.
Relationship to Natural Hazard Mitigation Planning: Includes specific goals and policies related to mitigating natural hazards.

Local Emergency Management Plan: Last adopted on May 10, 2021
Description: Establishes lines of responsibility and procedures to be implemented during a disaster and identifies high risk populations, hazard sites, and available resources.
Relationship to Natural Hazard Mitigation Planning: Includes actions for tracking events and response actions including damage reports to facilitate funding requests during recovery. This type of information can be essential to preparing hazard mitigation project applications for FEMA funding.

Road Stormwater Management Plan: December 2019
Description: Prioritizes those infrastructure projects necessary to improve transportation network resiliency and water quality.
Relationship to Natural Hazard Mitigation Planning: Improvements are designed to minimize or eliminate flood impacts on hydrologically-connected road segments.

Financial

Financial capabilities are the resources that a community has access to or is eligible to use to fund mitigation actions.

Clarendon's current annual town budget is approximately $1,900,000 with $1,100,000 to fund the Highway Department. Although the Town has not done so in the past, it is eligible to incur debt through general obligation bonds to fund mitigation actions.

Strengths: tax revenues are sufficient for daily operations and handle contingencies and/or improvements ● maximize grant opportunities for public infrastructure projects

Areas for Improvement: not every department has a depreciation fund with a replacement schedule

Education and Outreach

Clarendon has several education and outreach opportunities that could be used to implement mitigation activities and communicate hazard-related information:

- Town website
- Mill River High School Newsletter
- Clarendon Elementary School phone system

Strengths: well established communication network within the local school system

Areas for Improvement: social media presence

National Flood Insurance Program Compliance

Clarendon joined the National Flood Insurance Program (NFIP) in 1980. The effective date of the current Flood Insurance Rate Map (FIRM) is August 28, 2008.

The Zoning Administrator enforces NFIP compliance through permit review requirements in its Flood Hazard Area regulations. Clarendon's regulations outline detailed minimum standards for development in flood hazard areas defined as FEMA Special Flood Hazard Areas and Floodway Areas.

The Town discussed the following as possible actions to continue NFIP compliance:

1) Provide information to residents on safe building initiatives and availability of flood insurance.
2) Ensure that floodplain and river corridor maps are kept up to date.

State Incentives for Flood Mitigation

Vermont's Emergency Relief Assistance Funding (ERAF) provides state funding to match FEMA Public Assistance after federally-declared disasters. Eligible public costs are generally reimbursed by FEMA at 75% with the State matching 7.5%. The State will increase its match to 12.5% or 17.5% of the total cost if communities take steps to reduce flood risk as described below.

12.5% funding for eligible communities that have adopted four (4) mitigation measures:

1) NFIP participation
2) Town Road and Bridge Standards
3) Local Emergency Plan
4) Local Hazard Mitigation Plan

17.5% funding for eligible communities that also participate in FEMA's Community Rating System OR adopt Fluvial Erosion Hazard or other river corridor protection bylaw that meets or exceeds the Vermont ANR model regulations.

Clarendon's current ERAF rate is 7.5%. Adoption of a FEMA-approved Local Hazard Mitigation Plan will increase this rate to 12.5%.

Mitigation Action Identification

The Hazard Mitigation Planning Team discussed the mitigation strategy, reviewed projects from the 2016 Plan, and identified possible new actions from the following categories for each of the highest risk natural hazards identified in Section 5:

1) **Local Plans and Regulations:** These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
2) **Structure and Infrastructure Projects:** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This applies to public or private structures as well as critical facilities and infrastructure. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance Program.
3) **Natural Systems Protection:** These are actions that minimize damage and losses and preserve or restore the functions of natural systems.
4) **Education and Awareness Programs:** These are actions to inform and educate the public about hazards and potential ways to mitigate them. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk is more likely to lead to community support for direct actions.

Local Plans and Regulations

Integrate Mitigation into Capital Improvement Programs: Hazard mitigation can be included in capital improvement programs by incorporating risk assessment and hazard mitigation principles into the capital planning efforts.

Manage Development in Erosion Hazard Areas: The intent of River Corridor Bylaws is to allow for wise use of property within river corridors that minimizes potential damage to existing structures and development from flood-related erosion.

Improve Stormwater Management Planning: Rain and snowmelt can cause flooding and erosion in developed areas. A community-wide stormwater management plan can address stormwater runoff.

Reduce Impacts to Roadways: Automobile or other transportation accidents are the leading cause of death and injury during winter storms, so it is important to plan for and maintain adequate road and debris clearing capabilities.

Develop a Drought Contingency Plan: A strategy for monitoring the progression of a drought and preparing a response to potential water supply shortages resulting from severe droughts or other water supply emergencies.

Structure and Infrastructure Projects

Remove Existing Structures from Flood Hazard Areas: FEMA policy encourages and may provide funding for the removal of structures from flood-prone areas to minimize future flood losses and preserve lands subject to repetitive flooding.

Improve Stormwater Drainage Capacity: Improving the stormwater drainage capacity can help to minimize inundation flooding and fluvial erosion by: 1) increasing drainage/absorption capacities with green stormwater management practices; 2) increasing dimensions of undersized drainage culverts in flood-prone areas; 3) stabilizing outfalls with riprap and other slope stabilization techniques; and 4) re-establishing roadside ditches.

Conduct Regular Maintenance for Drainage Systems: Regular maintenance will help drainage systems and flood control structures continue to function properly. Techniques include: 1) routinely cleaning and repairing stormwater infrastructure – culverts, catch basins, and drain lines; 2) routinely cleaning debris from support bracing underneath low-lying bridges; and 3) inspecting bridges and identifying if any repairs or retrofits are needed to maintain integrity or prevent scour.

Protect Infrastructure and Critical Facilities: Mitigation techniques can be implemented to help minimize losses to infrastructure and protect critical facilities from flood events by: 1) elevating roads above the base flood elevation to maintain dry access; 2) armoring the banks of streams near roadways to prevent washouts or 3) rerouting a stream away from a vulnerable roadway; and 4) floodproofing critical facilities.

Protect Power Lines: Power lines can be protected from the impacts of natural hazards by: 1) inspecting and maintaining hazardous trees in the road right-of-way during drainage system maintenance and 2) burying power lines.

Protect Critical Roadways: Use snow fences or living snow fences (e.g., rows of trees or other vegetation) to limit blowing and drifting of snow.

Retrofit Critical Facilities: Critical facilities can be protected from the impacts of high winds and winter storms by: 1) retrofitting critical facilities to strengthen structural frames to withstand wind and snow loads; 2) anchoring roof-mounted mechanical equipment; and 3) installing back-up generators or quick connect wiring for a portable generator.

Retrofit Water Supply Systems: Consider investing in infrastructure (like dry hydrants) to expand water supplies for fire suppression to ensure adequate supply during times of drought.

Natural Systems Protection

Protect and Restore Natural Flood Mitigation Features: Natural conditions often provide floodplain protection, riparian buffers, groundwater infiltration, and other ecosystem services that mitigate flooding. It is important to preserve such functionality. Possible projects include: 1) establishing vegetative buffers in riparian areas; 2) stabilizing stream banks; 3) removing berms; 4) minimizing impervious area development; and 5) restore incision areas.

Education and Awareness Programs

Educate Property Owners About Freezing Pipes: Extreme cold may cause water pipes to freeze and burst, which can cause flooding inside a building. Consider: 1) educating owners how to protect their pipes and 2) informing them that letting a faucet drip may prevent freezing and the buildup of excessive pressure, avoiding bursting.

Assist Vulnerable Populations: Measures could be taken to ensure vulnerable populations are adequately protected from the impacts of natural hazards, such as: 1) organizing outreach and 2) establishing and promoting accessible heating or cooling centers in the community.

Educate Residents on Drought-related Hazards and Water Saving Techniques: Increase awareness of drought-related hazards - brush fire, diminished water quality and quantity. Encourage residents to take water-saving measures, such as 1) install low-flow water saving showerheads and toilets; 2) check for leaks in plumbing or dripping faucets; and 3) install rain-capturing devices for irrigation.

Mitigation Action Evaluation and Prioritization

For each mitigation action identified, the Hazard Mitigation Planning Team evaluated its potential benefits and/or likelihood of successful implementation. Each action was evaluated against a broad range of criteria, including a planning level assessment of whether the costs are reasonable compared to the probable benefits. Results of this evaluation are presented in **Table 5**.

Mitigation Action Implementation

After careful evaluation and prioritization, the Planning Team agreed upon a list of actions that are acceptable and practical for the community to implement.

Those actions without overall public support/political will were not selected for implementation. Those actions whose costs were not reasonable compared to the probable benefits were also not selected.

For the selected actions, the Planning Team then 1) assigned a responsible party to lead the implementation of each action; 2) identified potential funding mechanisms; and 3) developed a timeframe for implementing each action. This action plan is presented in **Table 6**.

Note that the Town will make every effort to maximize use of future Public Assistance Section 406 Mitigation opportunities when available during federally declared disasters.

Table 5: Mitigation Action Evaluation and Prioritization

Mitigation Action	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
Local Plans and Regulations									
Integrate Mitigation into Capital Improvement Programs	1	1	1	1	1	1	6	1	Yes
Plan for and Maintain Adequate Road and Debris Clearing Capabilities	1	1	1	1	1	1	6	1	Yes
Update Road Erosion and Culvert Inventories	1	1	1	1	1	1	6	1	Yes
Review VTrans Bridge Inspection Reports [1] and Plan for Identified Repairs to Prevent Scour	1	1	1	1	1	1	6	1	Yes
Manage Development in Erosion Hazard Areas with River Corridor Bylaws	1	1	1	-1	1	1	5	1	Yes
Improve Stormwater Management Planning by Completing a Stormwater Management Plan	1	1	1	-1	1	1	5	1	Yes
Develop a Drought Contingency Plan	1	1	1	-1	-1	1	2	1	Yes
Structure and Infrastructure Projects									
Increase Dimension of Drainage Culverts in Flood-Prone Areas	1	1	1	1	1	1	6	1	Yes
Stabilize Outfalls	1	1	1	1	1	1	6	1	Yes
Routinely Clean and Repair Stormwater Infrastructure	1	1	1	1	1	1	6	1	Yes
Protect Power Lines and Roadway by Inspecting and Removing Hazardous Trees in Road ROW	1	1	1	1	1	1	6	1	Yes
Use Snow Fence on Critical Roadways	1	1	1	1	1	1	6	1	Yes
Expand Water Supplies for Fire Suppression	1	1	1	1	1	1	6	1	Yes
Install/Re-establish Roadside Ditches	1	1	1	1	1	1	6	1-2	Yes
Install Back-up Generators or Quick Connect Wiring at Critical Facilities	1	1	1	0	1	1	5	1	Yes
Increase Drainage/Absorption Capacities with Green Stormwater Management Practices	0	1	1	0	1	1	4	1	Yes
	Planning Team did not recommend this action for implementation due to lack of information about appropriate locations for these practices. Once the Town completes a Stormwater Management Plan, appropriate locations may be identified and addressed accordingly.								
Remove Existing Structures from Flood-Prone Areas	1	1	1	0	1	1	5	2-3	No
Elevate Roads Above Base Flood Elevation to Maintain Dry Access	1	1	1	-1	1	0	3	3	No
Bury Power Lines	1	1	1	-1	-1	1	2	3	No
Routinely Clear Debris from Support Bracing Underneath Low-Lying Bridges	There are no low-lying bridges with support bracing, so the Planning Team did not evaluate this action.								
Floodproof Critical Facilities	There are no critical facilities in flood-prone areas, so the Planning Team did not evaluate this action.								
Retrofit Critical Facilities to Strengthen Structural Frames to Withstand Wind and Snow Loads	No critical facilities that require retrofitting, so the Planning Team did not evaluate this action.								
Anchor Roof-Mounted Mechanical Equipment on Critical Facilities	No critical facilities with roof-mounted mechanical equipment, so the Planning Team did not evaluate this action.								
Natural Systems Protection									
Establish Vegetative Buffers in Riparian Areas	1	1	1	0	1	1	5	1	Yes
Stabilize Stream Banks	1	1	1	0	1	1	5	1	Yes

[1] VTrans inspects all town-owned bridges in the State's Town Highway Bridge Program every two years. Bridge inspection reports are available on the VTrans website.

Mitigation Action	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
Natural Systems Protection (cont.)									
Remove Berms and/or Accumulated Debris from Stream to Restore Flood Capacity	1	1	1	0	1	1	5	1	Yes
Restore Incision Areas	No known incision areas, so the Planning Team did not evaluate this action.								
Education and Awareness Programs									
Educate Property Owners about Freezing Pipes	1	1	1	1	1	1	6	1	Yes
Keep the Ditches Clean Campaign	1	1	1	1	1	1	6	1	Yes
Educate Residents on Drought-related Hazards and Water Saving Techniques	1	1	1	1	1	1	6	1	Yes
Assist Vulnerable Populations	Clarendon's Local Emergency Management Plan includes information on how to address the needs of vulnerable populations during an emergency. A public education campaign could be undertaken to better inform residents how to access emergency shelters.								

Table 5 Evaluation Criteria:

Life Safety – How effective will the action be at protecting lives and preventing injuries?
Property Protection – How effective will the action be at eliminating or reducing damage to structures and infrastructure?
Technical – Is the mitigation action a long-term, technically feasible solution?
Political – Is there overall public support/political will for the action?
Administrative – Does the community have the administrative capacity to implement the action?
Other Community Objectives – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation?

Rank each of the above criteria in Table 5 with a -1, 0, or 1 using the following table:
1= Highly effective or feasible
0 = Neutral
-1 = Ineffective or not feasible

Estimated Cost – 1 = less than $50,000; 2 = $50,000 to $100,000; 3 = more than $100,000
C/B – Are the costs reasonable compared to the probable benefits? Yes or No

Table 6 Community Lifelines Description: A Community Lifeline enables the continuous operation of critical government and business functions and is essential to human health and safety or economic security. The primary objective of lifelines is to ensure the delivery of critical services that alleviate immediate threats to life and property when communities are impacted by disasters. These critical services are organized into one of seven lifelines:

1. Law Enforcement
2. Fire Service
3. Search & Rescue
4. Government Service
5. Community Safety

1. Food
2. Water
3. Shelter
4. Agriculture

1. Medical Care
2. Public Health
3. Patient Movement
4. Medical Supply Chain
5. Fatality Management

1. Power Grid
2. Fuel

1. Infrastructure
2. Responder Communications
3. Alerts, Warnings, & Messages
4. Finance
5. 911 & Dispatch

1. Highway/Road/ Motor Vehicle
2. Mass Transit
3. Railway
4. Aviation
5. Maritime

1. Facilities HAZMAT, Pollutants, Contaminants

Table 6: Mitigation Action Implementation

Plan for and Maintain Adequate Road and Debris Clearing Capabilities: This includes capital planning and funding to support the appropriate number of staff and equipment needed to maintain the transportation network in Clarendon.

ADDRESSED HAZARDS

Winter Storm
Primary Hazard

High Winds

Lead Party
Selectboard

Type of Project
Local Plans and Regulations

COMMUNITY LIFELINES TARGETED

Safety & Security

Transportation
Primary Lifeline

Area of Impact
Town-wide; ±52 mile road network

FUNDING SOURCES
- Local funding

PARTNERSHIPS
- Road Commissioner

BENEFIT SCORE = 6

PROJECT TIMELINE
To coincide with preparing the annual Town budget each fall

Update Road Erosion and Culvert Inventories: These inventories were completed in 2018 and serve as the basis for asset management and should be kept up-to-date annually, with a full re-assessment approximately every 5 years.

ADDRESSED HAZARDS

Flooding

Lead Party
Road Commissioner

Type of Project
Local Plans and Regulations

COMMUNITY LIFELINES TARGETED

Safety & Security

Transportation
Primary Lifeline

Area of Impact
Town-wide; ±26 miles of hydrologically-connected roads and ±596 culverts

FUNDING SOURCES
- Local funding
- VTrans Grant Programs

PARTNERSHIPS
- Selectboard
- Rutland Regional Planning Commission (RPC)

BENEFIT SCORE = 6

PROJECT TIMELINE
Re-assessment in 2024 construction season

Plan for Bridge Repairs: Every two years, VTrans inspects all town-owned bridges that are in the State's Town Highway Bridge Program. These inspection reports will be reviewed and used to plan for any identified flood-related bridge repairs. The Town will do their own periodic inspections of other bridges, not part of the State Program, and plan for repairs as needed.

ADDRESSED HAZARDS

Flooding

Lead Party
Road Commissioner

Type of Project
Local Plans and Regulations

COMMUNITY LIFELINES TARGETED

Safety & Security

Transportation
Primary Lifeline

Area of Impact
13 bridges in State Program: B7, B8, B10, B11, B12, B13, B14, B15, B24, B25, B26, B27, B28

8 other town-owned bridges: B1, B2, B4, B5, B6, B9, B16, B17

FUNDING SOURCES
- Local funding
- FEMA BRIC

PARTNERSHIPS
- Selectboard
- VTrans

BENEFIT SCORE = 6

PROJECT TIMELINE
2022 – Plan for repairs to B14 (Middle Rd)
2022 – Plan for repairs to B4 (Creek Rd)
2023 – Plan for repairs to B28 (Kingsley Covered Bridge)

Adequately Size Drainage and Perennial Stream Culverts in Flood-Prone Areas: Undersized culverts can lead to road washouts and flooding. Clarendon has identified several locations where upsized culverts are needed.

ADDRESSED HAZARDS

Flooding

Lead Party
Road Commissioner

Type of Project
Structure and Infrastructure

COMMUNITY LIFELINES

Safety & Security

Transportation
Primary Lifeline

Area of Impact
1) East St, Quarterline Rd, Hier Rd
2) Teer Rd, School House Rd, Mumford Rd
3) E Tinmouth Rd, Knipes Rd
4) Others, including driveway culverts, as required by MRGP

FUNDING SOURCES
- Local funding
- VTrans Grant Programs
- FEMA Hazard Mitigation Grant

PARTNERSHIPS
- Selectboard

BENEFIT SCORE = 6

PROJECT TIMELINE
1) 2021 construction season
2) 2022 construction season
3) 2023 construction season

Stabilize Culvert Outfalls: Erosion at the outlet of culverts is common and can cause structural failure with serious downstream consequences. Properly stabilized outfalls protect channel bank stability and reduce erosion. Clarendon has identified the following locations where culvert outlet stabilization is needed.

ADDRESSED HAZARDS

Flooding

Lead Party
Road Commissioner

Type of Project
Structure and Infrastructure

COMMUNITY LIFELINES TARGETED

Safety & Security

Transportation
Primary Lifeline

Area of Impact
1) Same as culvert replacement project locations listed above
2) Others as required by MRGP

FUNDING SOURCES
- Local funding
- VTrans Grant Programs
- FEMA HMGP

PARTNERSHIPS
- Selectboard

BENEFIT SCORE = 6

PROJECT TIMELINE
1) Same as culvert replacement project timeline above

Routinely Clean and Repair Stormwater Infrastructure: Regular maintenance is one of the most effective ways to mitigate the impacts of flooding. Routine cleaning and repairs of ditches, culverts, and catch basins will be done according to the Highway Department's maintenance schedule and the Municipal Roads General Permit (MRGP).

ADDRESSED HAZARDS

Flooding

Lead Party
Road Commissioner

Type of Project
Structure and Infrastructure

COMMUNITY LIFELINES

Safety & Security

Transportation
Primary Lifeline

Area of Impact
Town-wide; ±52 mile road network and ±596 culverts

FUNDING SOURCES
- Local funding
- VTrans Grant Programs

PARTNERSHIPS
- Selectboard

BENEFIT SCORE = 6

PROJECT TIMELINE
See Highway Dept Maintenance Schedule and MRGP

Remove Hazardous Trees in Road Right-of-Way: Hazardous trees in the road right-of-way can contribute to power and communication outages as well as debris in the roadway during winter storms and high wind events. This hazard is exacerbated by the possibility of an Emerald Ash Borer infestation. Clarendon will remove hazardous trees within their road ROW as they are identified and/or request removal by Green Mountain Power if within the utility ROW.

ADDRESSED HAZARDS

Winter Storm

High Winds

Lead Party
Road Commissioner

Type of Project
Structure and Infrastructure

COMMUNITY LIFELINES TARGETED

Energy
Primary Lifeline

Transportation

Communications

Area of Impact
Town-wide

FUNDING SOURCES
- Local funding

PARTNERSHIPS
- Tree Warden
- Green Mountain Power
- Selectboard

BENEFIT SCORE = 6

PROJECT TIMELINE
As needed

Use Snow Fence or Equivalent Technique on Critical Roadways: Using snow fences or an equivalent technique to limit blowing and drifting of snow over critical road segments can reduce the risks of auto or other transportation accidents.

ADDRESSED HAZARDS

Winter Storm
Primary Hazard

High Winds

Lead Party
Road Commissioner

Type of Project
Structure and Infrastructure

COMMUNITY LIFELINES TARGETED

Safety & Security

Transportation
Primary Lifeline

Area of Impact
Alfrecha, Walker Mountain, Middle, and Firehouse Roads

FUNDING SOURCES
- Local funding

PARTNERSHIPS
- Private Property Owners
- Selectboard

BENEFIT SCORE = 6

PROJECT TIMELINE
Secure approval from landowners by November of each year

Expand Water Supplies for Fire Suppression: Lacking municipal drinking water infrastructure, Clarendon relies exclusively on a system of dry hydrants for fire suppression. During times of drought, surface water sources relied upon could become compromised. To improve fire suppression, Clarendon will assess functionality of all existing dry hydrants and explore locations for additional hydrants that might be needed.

ADDRESSED HAZARDS

Drought

Lead Party
Selectboard

Type of Project
Structure and Infrastructure

COMMUNITY LIFELINES

Safety & Security

Area of Impact
Town-wide

FUNDING SOURCES
- Local funding
- Vermont Rural Fire Protection Task Force

PARTNERSHIPS
- Clarendon Vol Fire Dept

BENEFIT SCORE = 6

PROJECT TIMELINE
Complete assessment by Dec 2023

Re-work Roadside Ditches: Properly installed and stabilized roadside ditches are critical to protect the integrity of the road. Although Clarendon has an extensive network of ditches, the areas noted below either need new ditches or have ditches that need to be re-worked to bring them up to current municipal Road Standards.

ADDRESSED HAZARDS

Flooding

Lead Party

Road Commissioner

Type of Project

Structure and Infrastructure

COMMUNITY LIFELINES TARGETED

Safety & Security

Transportation
Primary Lifeline

Area of Impact

1) Anderson Hill Rd
2) East St
3) Teer Rd
4) Others as required by MRGP

FUNDING SOURCES

- Local funding
- VTrans Grant Programs

PARTNERSHIPS

- Selectboard

BENEFIT SCORE = 6

PROJECT TIMELINE

1) 2021 construction season
2) 2021 construction season
3) 2022 construction season
4) See MRGP

Install Back-up Power at Critical Facilities: Generators are emergency equipment that provide a secondary source of power to a facility. Clarendon has identified one critical facility in need of back-up power.

ADDRESSED HAZARDS

All Hazards

Lead Party

Selectboard

Type of Project

Structure and Infrastructure

COMMUNITY LIFELINES TARGETED

Energy
Primary Lifeline

Communications

Area of Impact

1) Town Office

FUNDING SOURCES

- Local funding
- FEMA HMGP

PARTNERSHIPS

- None

BENEFIT SCORE = 5

PROJECT TIMELINE

1) Jan 2026 – Dec 2026

Establish Vegetative Buffers in Riparian Areas, Stabilize Stream Banks, Remove Berms and/or Accumulated Debris to Restore Flood Capacity: Clarendon will work to identify areas for future projects, especially those in the 2013 River Corridor Plan for the Cold River Watershed. In 2021, a berm removal project on the Cold River was underway to establish a flood chute upstream of bridge B14 on Middle Road. This project was managed by the Rutland Natural Resources Conservation District (NRCD) with funding from the Environmental Restoration Grant Program.

ADDRESSED HAZARDS

Flooding

Lead Party

Selectboard

Type of Project

Natural System Protection

COMMUNITY LIFELINES TARGETED

Safety & Security
Primary Lifeline

Transportation

Area of Impact

1) Cold River Watershed, particularly west of VT Route 7
2) Mill River Watershed
3) Otter Creek Watershed

FUNDING SOURCES

- Local funding
- VANR Water Quality Grants

PARTNERSHIPS

- Road Commissioner

BENEFIT SCORE = 5

PROJECT TIMELINE

Selectboard, at their discretion, will review natural systems projections on an as needed basis

Educate Property Owners about Severe Winter and Drought-related Hazards; and Keep the Ditches Clean Campaign: Clarendon will conduct educational outreach by posting information on the Town website about 1) severe winter storm-related hazards (e.g., freezing pipes); 2) drought-related hazards (e.g., brush fires, diminished water quality, water conservation); and 3) the importance of keeping roadside ditches free of yard waste and other debris.

Addressed Hazards

Winter Storm

Drought

Flooding

Lead Party

Selectboard

Type of Project

Education and Awareness

Community Lifelines

Safety & Security
Primary Lifeline

Transportation

Food, Water, Shelter

Area of Impact

Town-wide

Funding Sources

- Local funding

Partnerships

- Road Commissioner
- Emergency Management Director/Fire Chief

Benefit Score = 6

Project Timeline

May 2022 – Drought
Sept 2022 – Keep the Ditches Clean
Dec 2022 – Winter Storm

Process for Incorporating Plan Requirements into Other Planning Mechanisms

Information and recommendations from the 2016 Clarendon Local Hazard Mitigation Plan were incorporated into the Clarendon Town Plan, adopted in June 2016. The 2016 Town Plan includes an entire chapter dedicated to Clarendon's Flood Resilience.

Key municipal regulations, like zoning regulations and flood hazard area regulations, have not been updated since 2016.

For Clarendon to succeed in its efforts to continue reducing long-term risks associated with natural hazards, the information and recommendations of the 2021 Plan should be integrated throughout government operations.

The following are specific examples of how the Town will incorporate this Plan into other plans, programs, and procedures:

- The Selectboard will work with the Road Commissioner to incorporate risk assessment and hazard mitigation goals into capital planning efforts and improvement programs.

- The Road Commissioner and Selectboard will implement several mitigation infrastructure projects (e.g., upsize perennial and drainage culverts in flood-prone areas, re-work roadside ditches) through existing plans (2019 Road Stormwater Management Plan for hydrologically-connected road segments.)

- The Selectboard will identify opportunities to collaborate on addressing natural system protection projects in the Cold River, Mill River, and Otter Creek Watersheds that meet the goals of this Plan.

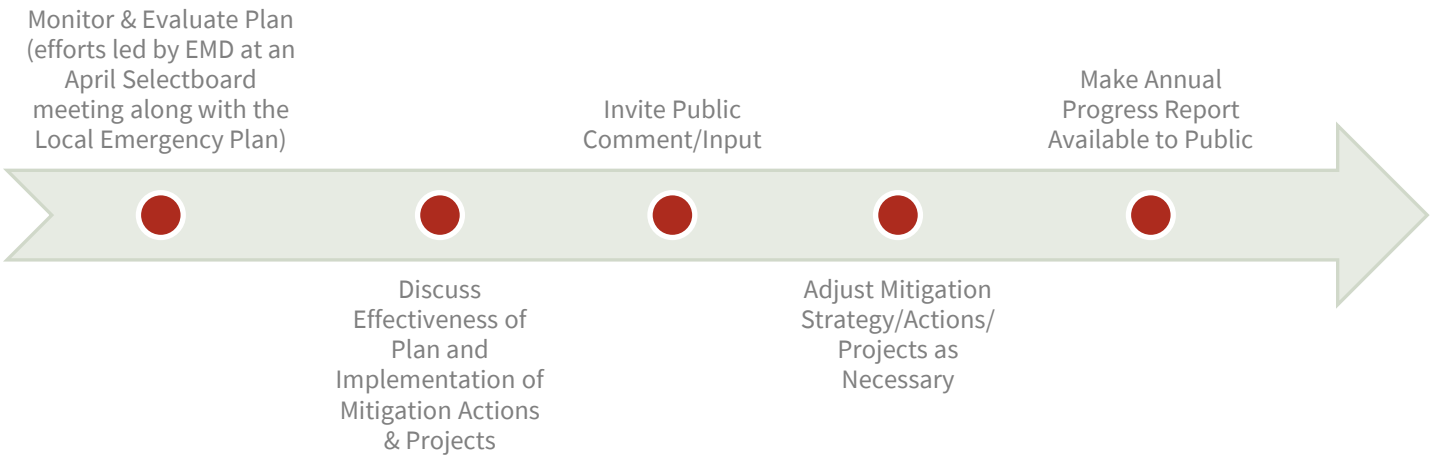
- The Planning Commission will integrate hazard mitigation goals for disaster resiliency into the goals and objectives of the next updates to the Town Plan, Zoning Regulations, and Flood Hazard Area Regulations.

7 PLAN MAINTENANCE

This Plan is dynamic. To ensure the Plan remains current and relevant, it is important it be monitored, evaluated, and updated periodically.

Monitoring and Evaluation

This Plan will be monitored and evaluated annually starting in 2022 in accordance with the following process:



The status (e.g., in progress, complete) of each mitigation action should be recorded in **Table 7**. If the status is "in progress" note whether the action is on schedule. If not, describe any problems, delays, or adverse conditions that will impair the ability to complete the action.

Updating

This Plan will be updated at a minimum every five (5) years in accordance with the following process:

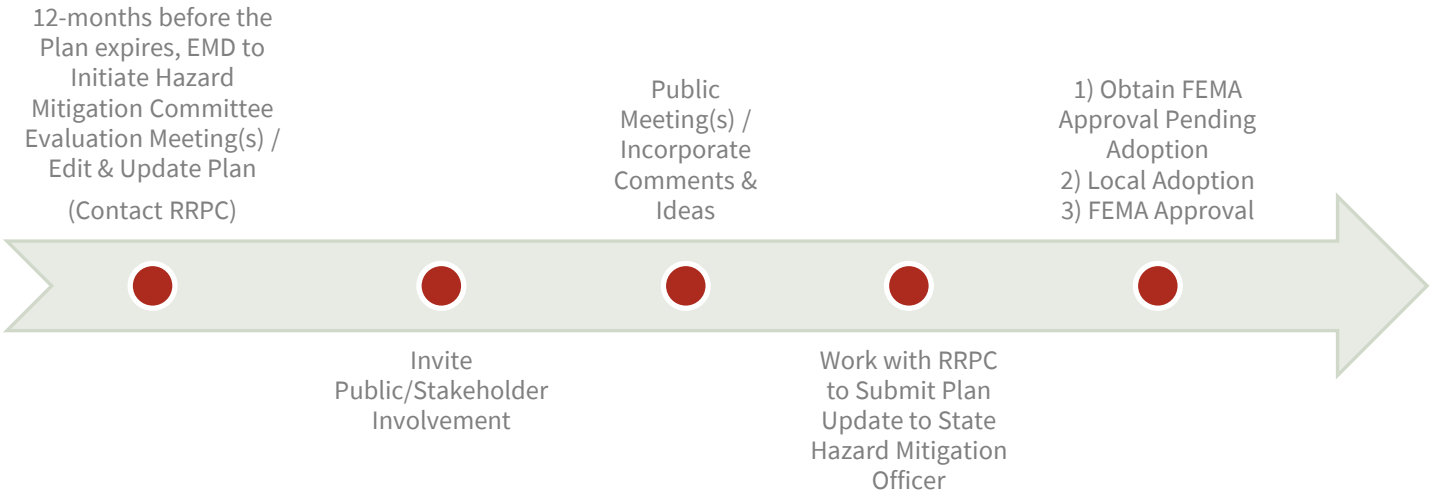


Table 7: Mitigation Action Status

Mitigation Action	2022	2023	2024	2025	2026
Local Plans and Regulations					
Plan for and Maintain Adequate Road and Debris Clearing Capabilities					
Update Road Erosion and Culvert Inventories					
Plan for Bridge Repairs					
Structure and Infrastructure Projects					
Adequately Size Drainage and Perennial Stream Culverts in Flood-Prone Areas					
Stabilize Culvert Outfalls					
Routinely Clean and Repair Stormwater Infrastructure					
Remove Hazardous Trees in Road Right-of-Way					
Use Snow Fence or Equivalent Technique on Critical Roadways					
Expand Water Supplies for Fire Suppression					
Re-work Roadside Ditches					
Install Back-up Power at Critical Facilities					
Natural Systems Protection					
Establish Vegetative Buffers in Riparian Areas, Stabilize Stream Banks, Remove Berms and/or Accumulated Debris from Stream to Restore Flood Capacity					
Education and Awareness Programs					
Drought-related Hazards Educational Outreach					
Keep the Ditches Clean Educational Outreach					
Severe Winter-related Hazards Educational Outreach					

CERTIFICATE OF ADOPTION
TOWN OF Clarendon, Vermont Selectboard
A RESOLUTION ADOPTING THE Clarendon, Vermont 2021 Local Hazard Mitigation Plan

WHEREAS, the Town of Clarendon has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the **2021 Clarendon, Vermont Local Hazard Mitigation Plan,** which result in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Clarendon has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its **2021 Clarendon, Vermont Local Hazard Mitigation Plan (Plan)** under the requirements of 44 CFR 201.6; and

WHEREAS, the **Plan** specifically addresses hazard mitigation strategies, and Plan maintenance procedures for the Town of Clarendon; and

WHEREAS, the **Plan** recommends several hazard mitigation actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Clarendon with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this **Plan** will make the Town of Clarendon eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by Town of Clarendon Selectboard:

1. The **2021 Clarendon, Vermont Local Hazard Mitigation Plan** is hereby adopted as an official plan of the Town of Clarendon;

2. The respective officials identified in the mitigation action plan of the **Plan** are hereby directed to pursue implementation of the recommended actions assigned to them;

3. Future revisions and **Plan** maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution; and

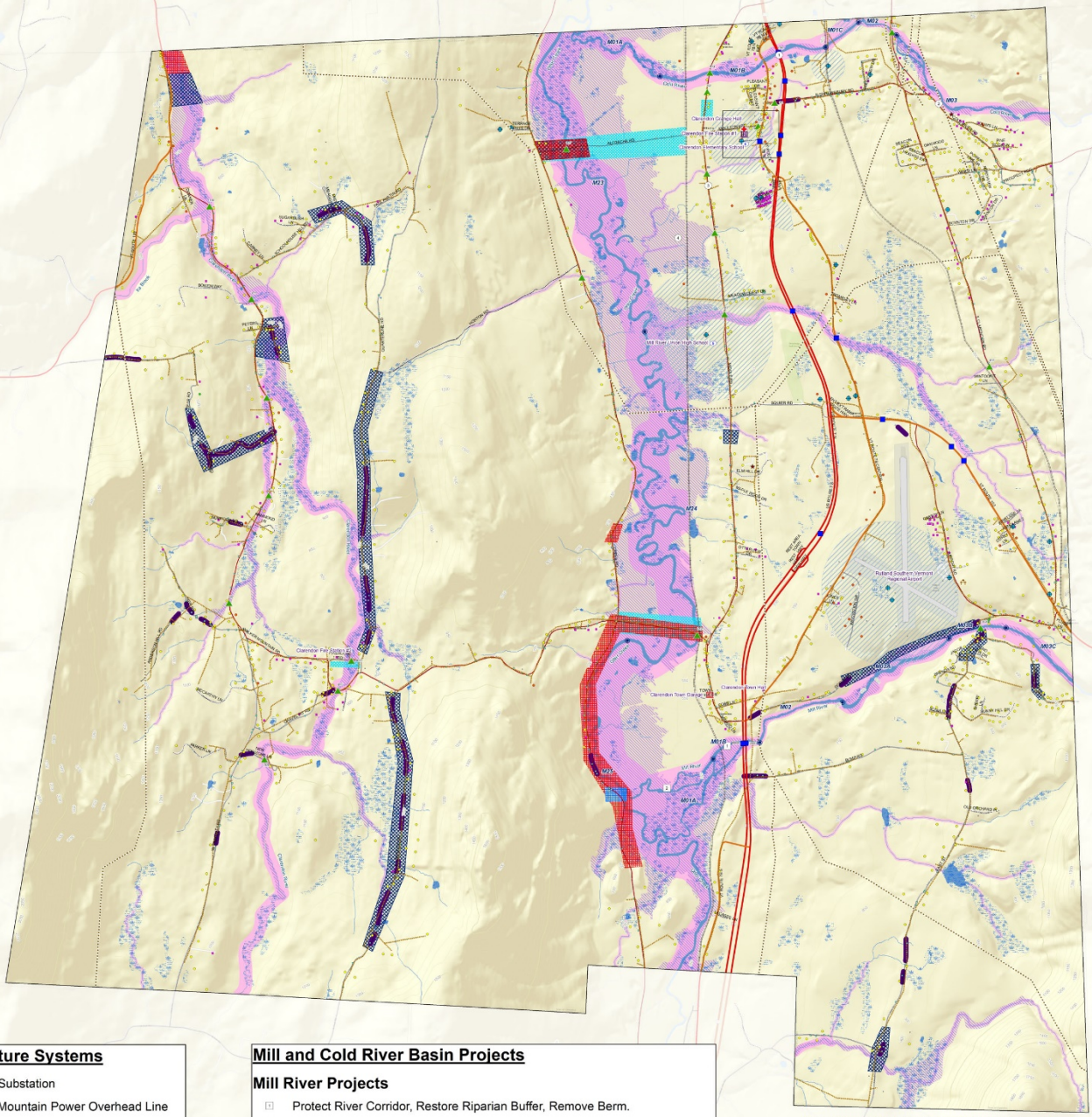
4. An annual report on the process of the implementation elements of the Plan will be presented to the Selectboard by the Emergency Management Director or Coordinator.

IN WITNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Clarendon this 13th day of December 2021.

Selectboard Chair

ATTEST
Gloria Menard
Town Clerk

Clarendon, Vermont: Local Natural Hazards and Vulnerabilities Map



Infrastructure Systems
- Power Substation
- Green Mountain Power Overhead Line
- VT Electric Transmission Line Corridors
- Drinking Water Well
- Source Protection Area - Groundwater
- State Bridge or Culvert
- Town Bridge
- Town Culvert
- US Highway
- State Highway
- Town Highway Class 1
- Town Highway Class 2
- Town Highway Class 3
- Town Highway Class 4
- Private Road
- Road Segment Does Not Meet Municipal Road General Permit Standard (as of August 2018)

Mill and Cold River Basin Projects

Mill River Projects
- Protect River Corridor, Restore Riparian Buffer, Remove Berm.
- Protect River Corridor, Restore Riparian Buffer.

Cold River Projects
- Bridge/road failure due to severe erosion along the north bank.
- Embankment erosion/failure on south bank and damaged utility poles.
- Severe overbank flooding,fine sediment deposition, south embankment failure.
- Severe overbank flooding and fine sediment deposition in farm fields.

Local Hazards
- Fluvial Erosion
- Innundation
- Flash Flooding
- Areas of Drifting Snow

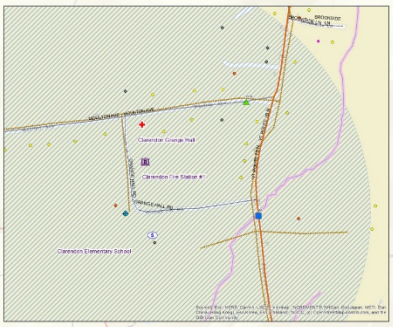
Critical Facilities

Emergency Operations Center
- Primary EOC - Clarendon Town Hall: 279 Middle Rd
- Alternate EOC - Clarendon Fire Station #1: 39 Grange Hall Rd

Emergency Shelter
- Primary Shelter - Clarendon Grange Hall: 111 Moulton Ave

Other Structures
- Cemetery

Residential Structures
- Mobile Home
- Condominium
- Other Residential
- Multi-Family Residential
- Single Family Residential
- All Other Structures
- Commercial



Natural Resources
- Phase 2 Reach Break
- Vermont Significant Wetland Inventroy
- Rivers and Streams
- Lakes, Ponds, & Major Rivers
- FEMA Special Flood Hazard Area
- River Corridor Small Streams(50 ft setback)
- Vermont River Corridor

Date: 8/2/2021

RUTLAND REGIONAL PLANNING COMMISSION

RRPC Path: D:\RRPC\CLARENDON\Clarendon Vulnerability Map 2021.mxd

0 1,250 2,500 5,000
Feet

0 0.25 0.5 1
Miles

1 inch = 0.2 miles

2016 Mitigation Actions and Projects

Vulnerability Addressed	Mitigation Action	Local Leadership	Funding Resources	Target Start (Month/Year)	Target End (Month/Year)	2021 Update
Thunderstorms	Tree cutting along roads	Road Commissioner	Local budget	April 15, 2016 (Annually)	Oct 15, 2020 (Annually)	Ongoing; remains a priority
Highway and Railroad Accidents	Install RR warning signals on Alfrecha and Walker Mountain Roads	Selectboard	Funding from Vermont RailSystem	State to set date	State to set date	Signals installed on Alfrecha Rd – this is not a natural hazard and no longer addressed in this plan
Flooding; Severe thunderstorms; Winter storms	Replace substandard culverts in accordance with State standards. Update Culvert Inventory	Road Commissioner	Local budget	July 2015	December 2020	Not complete; remains a priority; Culvert Inventory completed in 2018 with re-assessment scheduled for 2024
Severe thunderstorms and winter storms	Retrofit municipal buildings (especially Town Hall) which are vulnerable to structural damage from wind and ice	Selectboard	Local budget; State HMGP	July 2015	October 2020	Complete
Flooding, severe thunderstorms, winter storms	Install emergency power generators at key sites in town such as designated shelters, fire stations, and EOC locations	Selectboard, Clarendon Volunteer Fire Dept, and Emergency Management Coordinator	Local budgets; State HMGP	November 2015	March 2016	Not complete; remains a priority

2016 Preparedness Actions and Projects

Hazards Mitigated	Preparedness Action	Local Leadership	Funding Resources	Target Start	Target End	2021 Update
Flooding	Examine current Town Plan, bylaws and development regulations to ensure that identified hazard areas are addressed	Planning Commission	Local budget	July 2015	March2016	Complete

Hazards Mitigated	Preparedness Action	Local Leadership	Funding Resources	Target Start	Target End	2021 Update
Flooding	Attend regular training sessions on floodplain management and flood regulations administration	Selectboard and planning commission	Local budget	July 2015	January2016	Ongoing; remains a priority
Flooding	Public outreach: distribute FEMA brochures and guidebooks to public and local zoning officials (NFIP compliance action)	Town Clerk	No cost	July 2015	October2020	Complete
Structure fires; wildfires	Public outreach; distribute state brochures on fire prevention	Emergency Management Coordinator	No cost	July 2015	December 2020	Complete
Flooding, Severe thunderstorms, Winter storms, Structure fires, Wildfires	Incorporate proposed strategies into Annual Budget	Selectboard	Local budget	March2016	December 2020	Complete

*Any culvert and bridge replacements will be subject to the State Stream Alteration Permit, as these are Vermont's 'codes and standards. Therefore, any culvert 'replacements' described in this plan inherently anticipate upsizing the structure where appropriate to ensure resiliency.

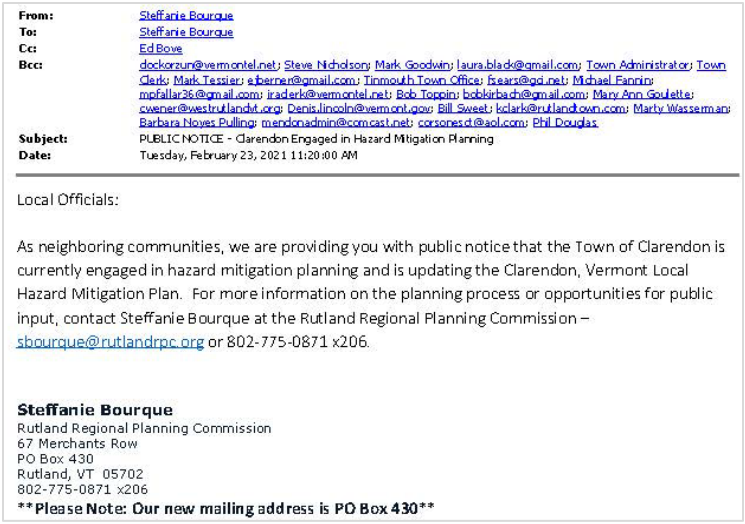
Acronyms

AFG Assistance to Firefighters Grant
AOT Vermont Agency of Transportation
BBR Vermont Better Back Roads Program
CDBG Community Development Block Grant
DEMHS Vermont Division of Emergency Management & Homeland Security
EOC Emergency Operations Center
FMA Flood Mitigation Assistance Program
HMGP Hazard Mitigation Grant Program
HRRR High Risk Rural Roads Program
HSU Vermont Homeland Security Unit
MPG Municipal Planning Grant
PDM Pre-Disaster Mitigation Program
RC&D Resource Conservation and Development
USDA United States Department ofAgriculture

SUMMARY OF PUBLIC COMMENTS ON DRAFT PLAN

Example notice of LHMP update kick-off from Rutland Regional Planning Commission Facebook page posted on February 23, 2021.

No inquiries received.



Notice emailed to local officials in neighboring communities announcing LHMP update kick-off – dated February 23, 2021. Similar email sent to Key Partners.

No inquiries received from neighboring communities.

Example notice of draft plan available for public review and comment from Rutland Regional Planning Commission Facebook page posted on May 21, 2021.

No comments received on May draft plan.

From: Steffanie Bourque
To: Medash, Kyle
Subject: Clarendon LHMP Available for Public Comment
Date: Thursday, May 20, 2021 2:53:00 PM
Attachments: Clarendon Draft LHMP 05-24-21.pdf

Hello, Kyle.

A draft of the first half of the Clarendon Local Hazard Mitigation Plan (LHMP), which includes an Introduction, Community Profile, and Hazard Identification and Risk Assessment, is available for public review. The attached draft and a brief overview of the work to date will be presented at the May 24, 2021 Selectboard meeting. Comments on the draft can be submitted to me by email until June 7, 2021 – sbourque@rutlandrpc.org.

I look forward to any comments you may have on the Town's vulnerabilities to flooding/fluvial erosion presented in Section 5 of the plan.

Kind regards,
Steffanie

Email to Key Partners seeking comments on draft plan, specifically Town vulnerabilities to highest risk natural hazards presented in Section 5 of the plan – dated May 20, 2021.

No comments on the May draft received from Key Partners.

Example notice of draft plan available for public review and comment from Rutland Regional Planning Commission Facebook page posted on September 13, 2021.

Comments received from local resident, September 28, 2021:

1) *The Locally Important Roads (map on page 3) are so defined because of the location of "important facilities" and access/interconnection to other parts of Town. It seems to me that the south end of the Middle Rd that connects to rte. 7 should also be included as a Locally Important Rd. If the road crew had to get to the east side of town (Bump Rd., East Rd., River Rd.) and the South end of the Middle Rd was not available to them, they may have to go north to Alfercha Rd. (the next important Rd) to gain access.*

Figure 1 on page 3 was revised to correct this deficiency.

2) *There is little to no discussion in the plan of the importance of the flood chutes available to the Mill River west of Route 7. These chutes can slow the river velocity during flooding thereby minimizing erosion and protecting important crop land and rail and road infrastructure from its damage. These chutes get filled from flooding silt, sand and gravel and did certainly during the Irene storm. They need management to assure their effectiveness. Including some discussion in the plan may indicate the importance of these chutes to the River Management group at the State level.*

This is a proposed Natural Systems Protection mitigation project intended to restore capacity in the Mill River floodplain. Like the flood chute project underway in 2021 on the Cold River, this project is one that the Town will work to determine feasibility for implementation at their discretion as needed.

From: Steffanie Bourque
To: Steffanie Bourque
Cc: Clarendon Admin
Bcc: dockorzun@vermontel.net; Steve Nicholson; Megan LaChance; laura.black@gmail.com; Town Administrator; Town Clerk; jcbagnall@gmail.com; eiberner@gmail.com; Tinmouth Town Office; fsears@gci.net; Michael Fannin; mpfallar36@gmail.com; iraclerk@vermontel.net; Bob Toppin; bobkirbach@gmail.com; Mary Ann Goulette; cwener@westrutlandvt.org; Denis.lincoln@vermont.gov; Bill Sweet; kclark@rutlandtown.com; Marty Wasserman; Barbara Noyes-Pulling; mendonadmin@comcast.net; corsonesct@aol.com; Phil Douglas
Subject: PUBLIC NOTICE - Clarendon Draft LHMP Available for Comment
Date: Monday, September 13, 2021 12:45:00 PM
Attachments: Clarendon Draft LHMP 09-13-21.pdf

Local Officials:

As neighboring communities, we are providing you with public notice that the draft Clarendon Local Hazard Mitigation Plan (LHMP) is available for public review and comment. A copy of the Plan is attached.

The Planning Team will present their work tonight at the September 13 Selectboard meeting to local officials and the public. Comments on the draft plan can be emailed to me, Steffanie Bourque, until September 27 – sbourque@rutlandrpc.org.

Kind regards,
Steffanie

Notice emailed to local officials in neighboring communities that a final draft LHMP is available for public review and comment – dated September 13, 2021. Similar email sent to Key Partners.

No comments on the September draft received from neighboring communities or Key Partners.