TOWN OF ELMORE, VERMONT
LOCAL HAZARD MITIGATION PLAN
2017 – 2021

Date: Select Board Approval to send Draft Plan to FEMA: March 8, 2017
Date: Select Board Approval, Revisions per VT DEMHS recommendations: April 12, 2017
Date: FEMA Approval Pending Adoption: June 12, 2017
Date: Elmore Select Board Adopted:
Date: FEMA Formal Approval:
Date: Plan expires:

This plan was developed by Elmore Select Board, Highway Department and Emergency Services – with technical assistance provided by the Lamoille County Planning Commission (LCPC). FEMA Emergency Management Planning Grant secured by the LCPC from the Vermont Department of Emergency Management and Homeland Security provided the funding support for the development of the plan.
1.0 Introduction
Hazard mitigation is any preventative or sustained action that ameliorates or eliminates long-term risk to people and property from natural and man-made causes and their effects. The purpose of this Local Hazard Mitigation Plan (Plan or LHMP) is to assist the Town of Elmore in recognizing possible hazards within the community and to identify possible strategies to address such hazards.

The current/previous Hazard Mitigation Plan was adopted by the Town of Elmore on January 14th, 2015 as an “annex” to the multi-jurisdictional All-Hazards Pre-Disaster Mitigation Plan adopted by the Lamoille County Planning Commission in 2012. Consistent with regulatory changes, this revision becomes a standalone plan for the Town of Elmore.

1.1 Community Profile
Elmore is a single jurisdiction, extremely rural, sparsely populated community (housing density of <15 residents/sq. mi. / population density of <26/sq. mi.) located in southeastern Lamoille County and about 26 miles from Vermont’s capital of Montpelier. Elmore is somewhat unique in that there are no significant industrial, chemical, transportation or other “man-made” areas vulnerable to hazardous events. Historical/potential hazardous areas and events in Elmore are largely natural in cause.


With the exception of the Highway Department and Town Clerk, all other town functions are provided by vigorous volunteers. The typical inhabitants of Elmore are highly self-reliant with an abnormally high percentage having the necessary tools, equipment, training and experience to effectively deal with natural disasters as they have for over 200 years. Elmore’s historically low frequency of assistance requests to various *EMA agencies is directly traceable to these community capabilities.

Elmore’s prominent natural features include Lake Elmore, Mount Elmore, Elmore State Park, the Worcester Range of the Green Mountains, several remote ponds plus large tracts of both wilderness and open fields. Terrain features consist of steep, forested hillsides and well-defined stream basins with deep stream channels. Elmore housing stock mix is approximately 30% recreational/seasonal (located near Lake Elmore), and 70% dispersed residential (scattered throughout). There are approximately 3 livestock, 3 produce and one nursery farms. Typical land utilization is predominantly smaller residential plots surrounded by large forested areas, both active and abandoned crop fields or abandoned, early to mid-successional stage old farm fields.

There are approximately 30 miles of class 3 town highways, several bridges and numerous culverts maintained by the Highway Department. Consistent with Vermont Statutes, the Town does not regularly maintain the approximately 10 miles of Class 4 roads and provides bare minimum trail maintenance. All maintenance, repairs and new construction of roads meets/exceeds State and Federal Standards for surface durability, stability, runoff, flooding and projected traffic load. The Vermont Agency of Transportation maintains Vermont Route 12 passing through the town center and connecting central Lamoille County municipalities southward to Montpelier and central Vermont.
Electricity is provided by four utilities: Morrisville Water & Light Department, Green Mountain Power, Hardwick Electric, and Washington Electric Cooperative. Morrisville Water & Light owns and operates a dam on Lake Elmore which is solely used to manage only the top 3 feet of lake level for the benefit of property owners. Flow management to the Lamoille River has not been needed nor considered. The outflow stream course is deep, well channeled and has not been susceptible to flooding for 100+ years.

Elmore’s public drinking water system is owned and operated by the Town. The system has 18 subscribers serving residences, the town hall, the elementary school, and a store in the Village. The water system was totally reconstructed in 2013-14 and operates flawlessly. All other Elmore structures are served by private well or spring systems. Fire coverage is provided primarily by the volunteer Elmore Fire Department with numerous dry hydrants, ponds and streams throughout the town. The Fire Department participates in the Lamoille Mutual Aid Association, which functions as a mutual aid response network among all eight Lamoille County fire departments. Elmore also has a special arrangement with the Wolcott Fire Department, whereby both departments respond to calls in the two communities. The Morristown Rescue Squad provides full-time emergency ambulance coverage. Law Enforcement support is provided by the Vermont State Police. The Lamoille County Sheriff’s Department provides basic traffic control. Typical of rural northern Vermont law enforcement support is infrequent and limited.

2.0 Planning Process Overview and Public Participation

This plan was prepared by the Elmore Select Board, Highway Department and Emergency Services, assisted by Lamoille County Planning Commission (LCPC). All Local Emergency Planning Committees (LEPC) were also provided with opportunities to give input. The Planning Team consisted of Robert Burley - Select Board Chair; Caroline DeVore - Select Board member; Rob Wills - Select Board member; Michel LaCasse - Road Commissioner; Brent Hosking - LECP representative, fire chief and Emergency Management Director, Lea Kilvadyova - LCPC Regional Planner.

Public Participation: All meetings are warned in compliance with VT Statutes which includes website, village public posting and newspaper as required. Agendas are published in advance via website and physical posting in advance of all meetings. Written, electronic and verbal responses were accepted, discussed and incorporated where relevant.

Key plan process milestones:

- December 14, 2016: Elmore Select Board, at a publicly warned meeting, discussed with the LCPC the need to revise the Hazard Mitigation Plan. One member of the public participated in the meeting and did not provide any comment regarding the plan update.
- February 8, 2017: Select Board, at a publicly warned meeting, discussed proposed revisions to the plan. The proposed revisions were prepared by the Select Board Chair in consultation with the LCPC in course of December 2016 and January 2017. Two members of the public participated in the meeting and provided no further input to the proposed revisions. After a discussion, the Select Board unanimously approved the proposed revisions and posted the draft of the plan at the town web site for further public input. The public was instructed to provide comments at the March 8 meeting of the Select Board.
- March 1, 2017: LCPC emailed the draft plan LEPCs #11 and #5 for review.
- March 8: Select Board held a publicly warned meeting to hear public comments. No public comment.
2.1. Existing Plans, Studies, Reports, and Technical Information
To develop this plan, Lamoille County Planning Commission reviewed the following resources:

- 2011 Regional All-Hazards Mitigation Plan and Elmore Annex to the Regional Plan
- 2013-2018 Elmore Town Plan
- 2017 Elmore Flood Hazard & River Corridor Regulations
- 2016 Elmore Local Emergency Operations Plan
- FEMA [https://www.fema.gov/disaster](https://www.fema.gov/disaster)
- 2013 State of Vermont Hazard Mitigation Plan
- Flood Insurance Rate Maps and National Flood Insurance Program information

2.2 Planning Process and Neighboring Communities
Neighboring communities were sent copies and encouraged to provide input into the development of this plan and review the draft plan. On March 1st, the plan was distributed to Local Emergency Planning Committees #11 and #5 members. The LEPCs are composed of emergency management professionals and volunteers and include representatives from all of Elmore’s neighboring communities. The LEPC members were instructed to provide feedback to Lea Kilvadyova, Lamoille County Regional Planner via email or phone.

2.3 Plan Maintenance Process and Continued Public Involvement in the Plan Maintenance Process
The Elmore Select Board, as the Designated Responsible Body, continuously evaluates effectiveness and issues of all town plans. It does so by assessing whether plan goals are being achieved and priority actions implemented. The Action Item List review occurs at all select board meetings. All meetings are public, properly warned with agendas in advance and minutes published IAW VT Statutes. Comments are batched for inclusion in subsequent revisions. Additionally, any significant event prompts a review of the goals and the actions by the Select Board.

One year prior to the expiration of the Plan, the Select Board will initiate and lead the process of the Plan update—with possible assistance from Lamoille County Planning Commission. Continued public involvement will occur through maintaining the existing processes as cited above plus the addition of all evolving required process changes. By Vermont Statute, the Select Board is the authority to vote on the plan approval.

Hazard Mitigation is an integral component of ALL town plans, zoning and design regulations, by-laws, operating guidelines and infrastructure upgrades. Benefitting from a small, tightly knit community, the Elmore hazard mitigation planning team is uncommonly tightly linked to all elements of the hazard mitigation process as the team consists of the very same individuals who regularly interact with State and Federal Agencies, conduct town operations, author and implement all town plans, zoning, plans, conduct site inspections as well as regular on-the-ground and aerial assessments of all topography, activities and changes throughout the town.

3.0 Hazard Identification and Risk Assessment (HIRA):
HIRA is a subjective tool to rate the expected impact of natural hazards within a specific community by factoring local vulnerability of people, buildings and infrastructure to natural events involving: loss of
life, personal injury, economic injury and property damage. It should be noted that the only significant threats to Elmore are natural in origin, the impacts of which will be significantly less than if occurring in more developed/populated areas. Historically, suspension of electrical service has very rarely exceeded 3 days. The public drinking water system and Emergency Services Buildings have generator back-up.

Guided by 100+ year historical records, Elmore reviewed, identified and evaluated eleven natural hazards. These hazards, presented in Table 1 below, are ranked based upon 1) frequency, 2) severity and 3) vulnerability.

**Frequency** is the typical likelihood the hazard will occur in any given year as follows:
1. Rare: < 1% probability in the next 100 years; may never have occurred in Vermont.
2. Unlikely: 1% to 4% probability in the next year, this type of event has occurred in Vermont.
3. Unusual: 5% to 10% probability in the next year, or at least one in the next 100 years.
4. Likely: 10% to 50% probability in the next year, or at least one chance in the next 10 years.
5. Frequent: Greater than 50% probability in the next year; Severity is highly variable.

**Severity** is the level of typically expected damage:
1. Minor: < 10% of property damage: <4 days Loss facilities/services: <1% population injuries
2. Serious: 11-25% property damage: 4-7 days loss facilities/services: <1% population injuries
3. Extensive: 26-50% property damage: 7-14 days loss facilities/services; 10% population injuries, few deaths
4. Catastrophic: > 50% property damage: > 14 days loss facilities/services; > 10% population injuries, multiple deaths

**Vulnerability** is the typically expected disruption of daily community function or access
1. Low: Functional access or inconvenience lasting < 24 hours
2. Moderate: Functional access or interruption 24hrs-48hrs
3. High: Functional access or interruption > 48 hours

**Table 1: Hazard Identification/Risk Assessment Table**

<table>
<thead>
<tr>
<th>Possible Hazard</th>
<th>Frequency</th>
<th>Severity</th>
<th>Extent</th>
<th>Community Vulnerability</th>
<th>Most vulnerable areas or items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding, flash flooding, fluvial erosion</td>
<td>Unusual</td>
<td>Minor</td>
<td>Flooding: 5-7 inches of rain (2011 Tropical Storm Irene in Southern VT); Fluvial Erosion: 50 feet along a stream bank in Elmore</td>
<td>Moderate</td>
<td>Damage to roads, culverts, bridges, and residences;</td>
</tr>
<tr>
<td>Winter storms: Snow and ice storms</td>
<td>Frequent</td>
<td>Minor</td>
<td>30 inches of snow or 2-3 inches of ice</td>
<td>Moderate</td>
<td>Temporary road impassability. loss of electricity</td>
</tr>
<tr>
<td>Severe High Wind: Thunderstorms, hurricanes</td>
<td>Likely</td>
<td>Minor</td>
<td>12 on Beaufort Wind Scale (1938 Hurricane)</td>
<td>Moderate</td>
<td>Road closures and loss of electricity from fallen trees; other vulnerabilities associated with flooding</td>
</tr>
<tr>
<td>Hailstorm</td>
<td>Unusual</td>
<td>Minor</td>
<td>2.00”” magnitude</td>
<td>Low</td>
<td>Damage to structures and other private and public property</td>
</tr>
<tr>
<td>Wildfire/forest fire</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Historically minor. High forest moisture typical</td>
<td>Low</td>
<td>Damage to structures, infrastructure</td>
</tr>
<tr>
<td>Drought</td>
<td>Unusual</td>
<td>Serious</td>
<td>Degree and duration of meteorological dryness</td>
<td>Moderate</td>
<td>Private well failures, wildfires, agricultural losses</td>
</tr>
<tr>
<td>Hazard Type</td>
<td>Frequency</td>
<td>Vulnerability</td>
<td>Impacts</td>
<td>Risk</td>
<td>Further Information</td>
</tr>
<tr>
<td>-------------------</td>
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<td>-------------------------------------</td>
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<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Micro to Light (0 – 4.9)</td>
<td>Low</td>
<td>See VT Geological Survey HAZUS report (9/03)</td>
</tr>
<tr>
<td>Landslide</td>
<td>Unusual</td>
<td>Minor</td>
<td>Richter scale; Beaufort scale; rainfall</td>
<td>Low</td>
<td>Damage to roads and structures</td>
</tr>
<tr>
<td>Tornado</td>
<td>Unusual</td>
<td>Minor</td>
<td>F1 or F2</td>
<td>Low</td>
<td>Road closures, electricity loss, major structure damage</td>
</tr>
<tr>
<td>Extreme Temperatures</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Not known</td>
<td>Low</td>
<td>Cold – plumbing, machinery transportation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hot – crop/livestock</td>
</tr>
<tr>
<td>Ice Jams</td>
<td>Unusual</td>
<td>Minor</td>
<td>Not known</td>
<td>Low</td>
<td>Damage to road infrastructure</td>
</tr>
</tbody>
</table>

The next section of the plan will address, in detail, two hazards with moderate community vulnerability. These are Flood/Fluvial Erosion and Severe High Wind. Winter storms, also identified as hazard with moderate vulnerability to community, are not addressed in the same level of detail as Elmore’s community ability to prepare for and respond to winter storms is historically high. At this time, no extraordinary mitigation actions have been identified to mitigate winter storms. This plan also does not address wild fire, drought, earthquakes, landslides, tornadoes, ice jams due to their low vulnerability, unusual frequency or minor severity.

3.1 Unusual Hazard: Flood, Fluvial erosion: Refer to Elmore Flood Hazard Map, Attachment A.
Hazard Definition: Flooding is the overflowing of rivers, streams, drains, ponds and lakes due to excessive rain, rapid melt of snow or ice. Flash flooding is a rapidly occurring flood event usually from excessive rain. Fluvial erosion is the removal of sediment from stream channel or banks by channel flow. While this process occurs normally over time as the stream channel continuously adjusts, more severe fluvial erosion can occur quickly during flood events and can pose significant risk to infrastructure and property located within the river corridor.

Extent: The worst flooding that can be anticipated is reflected by the 2011 events during Tropical Storm Irene in southern Vermont, where most areas received between 5 and 7 inches of rain, with the highest recorded amount in the Town of Mendon (11 inches). Had the northern part of the state received a comparable amount of rain during Irene, the results would have been equally catastrophic. Fluvial erosion has occurred on a single stream bank, limited to scour/erosion less than 50’ in length. Channel change has not occurred.

Location: In Elmore, parts of community most at risk are the ones located in the floodplain and along river corridors. These areas are shown on the attached Flood Hazard Map. Historical patterns and current 100yr flood projections might affect only 3 residences. Bridge vulnerability is confined to a single bridge. No highways are vulnerable to fluvial erosion. Less than 5% of all other town roads are vulnerable to washouts of embankments or culverts rarely exceeding 5-10’ in length. Complete road closures are extremely rare, rarely lasting longer than 24hours. Material reserves are stockpiled in town. Most roads have multiple accesses in the event of closure.

Elmore flood recovery assistance requests along with occurring with major flood events in Lamoille County (that resulted in federal disaster declarations), starting in 1995, is listed below. The list includes dates, public assistance funding received and descriptions of disasters.
August 1995 (DR 1063)    $70,769
January 1996 (DR 1101)  $8,237
July 1997 (DR 1184)    $90,766
August 2011 (DR-4022)  $46,000
May 23, 2013 (DR-4120) Elmore did not submit claims for FEMA’s financial assistance
April 15, 2014 (DR-4178) Elmore did not submit claims for FEMA’s financial assistance

**August 1995**: Record setting heavy rains caused flooding in six north-central counties of Vermont (FEMA-1063-DR-VT). This was the first time since the floods of 1927 and 1934 that a flood not only affected public infrastructure, but also personally impacted the residents of Vermont. Preliminary damage assessments indicated individual losses greater than damages to public infrastructure. Flood levels exceeded the 500-year event in several areas along the Lamoille River.

**January 1996**: Mid-winter flood event brought statewide destruction of private and public property with eleven Vermont counties included in the declared disaster area. This event left more than 150 communities eligible for public assistance (FEMA-1101-DR-VT).

**July 1997**: Excessive rain in several northern Vermont counties caused flash flooding and destruction of public and private property (FEMA-1184-DR-VT).

**August 28-29, 2011**: Tropical Storm Irene (DR-4022) devastates much of the eastern seaboard, causing unprecedented flooding across Vermont. Generally, the impact on southern parts of the state was far greater than in Lamoille County and other northern regions. However, Elmore experienced localized damage to public infrastructure, including roads, bridges and a culvert.

**May 23, 2013**: Heavy rainfall produced flash flooding across Lamoille and Chittenden Counties (DR 4120). Excessive runoff in the steep terrains washed out bridges, culverts and roads. Gradually the flash flooding transitioned to a flood event as larger rivers such as the Lamoille and Browns Rivers responded to the increased flows. Total federal public assistance provided by FEMA to the State to repair damages was $2,003,443. Elmore did not request FEMA public assistance funds.

**April 15, 2014**: Heavy rainfall and snowmelt caused widespread minor to moderate flooding across Lamoille County, mainly along and west of Route 100 (DR 4178). Numerous highways were flooded and there was widespread damage to gravel roadsides and many culverts failed in Johnson, Belvidere, Cambridge and Waterville. In Stowe, the recreation path sustained damage. Total public assistance provided by FEMA to the State to repair damages was $1,844,155. Elmore did not request FEMA public assistance funds.

### 3.1.1. National Flood Insurance Program (NFIP)

The Town of Elmore participates in the NFIP and currently has 1 policy in force. There are no repetitive loss properties located in Elmore. The town will continue to regulate and enforce NFIP requirements through its zoning regulations, including new and substantially improved construction regulations in Special Flood Hazard Areas and River Corridors. Upon receipt of a complete application for a substantial improvement or new construction the zoning administrator shall submit a copy of the application and supporting information to the State National Flood Insurance Program (NFIP) Coordinator at the Vermont Agency of Natural Resources, in accordance with 24 V.S.A. § 4424. A permit may be issued only following receipt of comments from the Agency, or the expiration of 30 days from the date the application was mailed to the Agency, whichever is sooner. The DRB shall consider comments from the NFIP Coordinator at ANR. The DRB may recess the proceedings on any application pending submission of
additional information. This bylaw shall be enforced under the municipal zoning bylaw in accordance with 24 VSA Chapter 117 § 4451, § 4452 and 24 VSA Chapter 59 §1974a. A copy of the notice of violation will be mailed the State NFIP Coordinator.

3.2. Frequent Hazard: Winter Storms
Hazard Definition: Severe Winter Storms deliver heavy accumulations of snow in excess of 12”, and may include cold temperatures and high winds leading to loss of electric power, road/access impairment and property damage

Extent: The most severe storms recorded snowfall up to 30”, the most recent of which was March 2017. Elmore sought no FEMA assistance. A 200-500 year event ice storm occurred in 1995 with 2-3 inches of ice accumulation. While possible, this is not an event that can be mitigated in advance.

Location: Winter storms are a hazard mostly because of their frequency and the less frequent possibility of power loss. Winter storms are a town-wide hazard and major blizzard events typically last approximately 12-24 hours and rarely exceed 72 hours. Wind drifting can occur on portions of exposed roads which are adjacent to fields.

The most recent FEMA disaster declarations in Lamoille County occurred in 2011 (DR4163) and 2013 (DR4207) causing damages estimated at $390,000 and $230,000 respectively.

Elmore Emergency plans and agreements are maintained in place, utilizing a) Elmore Highway Department equipment personnel, b) extensively augmented by on-call staffing, c) 4 in town construction/excavation companies and d) numerous local private plowing personnel. Roads are typically passable within less than 24 hours. Town buildings and emergency services shelters have access to back up power. Elmore and local utility companies regularly perform preventative actions to insure reliability, availability and maintainability of their infrastructure ROWs. Both entities are adequately staffed and equipped to respond to single and multiple events. Elmore planning and preparedness efforts include identification monitoring of emergency shelter(s), basic sleeping supplies, basic food and water and debris management capabilities.

3.3. Likely Hazard: Severe High Wind (Thunderstorms, Tropical storms, Hurricanes)
Hazard Definition: Severe thunderstorms, hurricanes and tropical storms are compound hazards are capable of producing precipitation, high winds, flooding, and fluvial erosion. Thunderstorm winds are generally short in duration, involving winds or gusts in excess of 50 mph. A tropical storm has a maximum sustained wind speed of 39–73 mph. A hurricane is a tropical cyclone with sustained winds that have reached speed of 74 mph or higher. Micro-Bursts are hurricane force winds associated with thunder storms which typically affect areas of 1-5 acres.

Extent: The worst windstorm that can be anticipated in Elmore would be comparable to that of the September 1938 hurricane, which caused widespread property damage throughout the state (reaching a force of 12 on the Beaufort Wind Scale, with estimated winds of 74+ mph).

Location: Thunderstorms and associated hazards can occur anywhere in Vermont at any time of the year; however, spring and summer are the most common times for severe thunderstorms. In Elmore the parts of the community most at risk are the 1% area and 3 houses located in the floodplain and along river corridor. These areas are shown on the attached Flood Hazard Map.
Since 2011, the year of tropical storm Irene, four FEMA disaster declarations caused by severe storms included Lamoille County. Each storm caused damages to public infrastructure, primarily roads and bridges. In August 2011, tropical storm Irene (DR 4022) caused damages estimated at $640,000 county-wide. In May 2012, a severe storm, tornado and flooding (DR 4066) caused damages estimated at $306,000 county-wide. In May 2013, damages from a severe storm (DR 4120) in Lamoille County were estimated at $145,000. In June 2014, a severe storm (DR 4178) damaged public infrastructure at the estimated price of $326,000 county-wide.

3.4. Critical Facilities and Areas of Concern
There are three critical facilities in the Town. These facilities include: Fire Department on Beach Road, Town Offices on Vermont Route 12 and the Elmore School (the last 1 room school in Vermont) also on Route 12. All three facilities can function as Emergency Operations Centers. The Fire Station/Emergency Shelter has back-up generator. Portable generators are available in the community for the school and Town Offices. Tree fall, wind damage, flood are not factors at any emergency facility. The most significant issue facing Elmore will be sanitary facilities in the event of mass shelter events.

A key area of focus is the low-lying intersection of Symonds Mill and East Elmore Roads. Other minor areas include: Lake Elmore Dam/Route 12 Bridge located in a low-lying area (never failed or eroded), a 100 yard stretch of Beach Road between Patch House and Town Garage which floods but remains passable. Of note is that the Lake Elmore dam only controls the top three feet of the lake and dam overflow into a rock and ledge strewn, deep stream course has never caused a problem in 100+ years.

The only “High Risk” populations are Elmore School (school year) and Elmore State Park (seasonal).

4.0 Goals and Actions: Emergency Preparedness and Hazard Mitigation
BACKGROUND: Elmore’s hazard mitigation goal remains and continues to be the reduction/avoidance of long-term vulnerabilities identified in this plan. In pursuit of this goal, Elmore engages in ongoing County and State emergency preparedness activities, continued investments in mitigation action projects and regular design reviews of all infrastructure, facilities and residential/agricultural/forest activities. Of note is that Elmore is in the final phase of a 3 year planned cycle upgrading all town plans, zoning, regulations and by-laws to comply with EPA/ANR, AOT, VEMA and FEMA directives. Development and land uses are guided and restricted as appropriate to the respective hazard, access, safety and environmental risks.

4.1 Recurring Community Preparedness Actions
Elmore’s community preparedness activities include:
- Maintenance and annual adoption of Local Emergency Operations Plan.
- Participation in Local Emergency Planning Committee meetings and activities
- Continued participation in National Flood Insurance Program and enforcement of Flood Hazard Bylaws
- Insuring vegetation management of all town and utility ROWs.
- Continuous capital plan upgrades to storm and wind prone infrastructure areas.
4.2 Past Mitigation Actions:
Below is the list of actions identified in the last planning cycle and their implementation status:

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annually review the Elmore Culvert Study</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Explore benefits of incorporating a fluvial erosion corridor into flood hazard regulations</td>
<td>Completed, Flood Hazard Regulations adopted in 2017</td>
</tr>
<tr>
<td>Complete upgrade of village water system and storage</td>
<td>Completed in 2013</td>
</tr>
<tr>
<td>Address flooding and erosion issues surrounding the box culvert on Symonds Mill Road</td>
<td>Completed in 2015</td>
</tr>
<tr>
<td>Apply for funding for a generator for Emergency Services Building</td>
<td>Completed 2016</td>
</tr>
<tr>
<td>Develop a winter storm plan annex. Rather than an annex, the Town has in place force augmentation agreements with personnel and equipment operators</td>
<td>Agreements in place</td>
</tr>
</tbody>
</table>

Elmore’s historical low participation rate in FEMA/VEMA assistance programs clearly suggests the town’s continuous hazard mitigation policies, infrastructure construction and maintenance are well positioned to deal with and respond to natural disasters. Overall, Elmore’s capabilities to address vulnerabilities and hazards are considered highly adequate in relation to the size of the community and the available financial resources. Should significant demands to improve emergency response and hazard mitigation be identified, Elmore will utilize the then current financial augmentation options. Elmore’s standard operating and budgeting practices are to design, implement and maintain all community aspects to a 3 sigma, worst case level, leading to a comparatively small list of currently planned Mitigation Actions.

New hazard mitigation actions listed in this plan will be incorporated into a Town Plan during the next town plan update in 2018. Additionally, actions identified in this plan will be made available to state agencies for their incorporation into statewide plans including the Tactical Basin Plan for Lamoille and Winooski River Watersheds of the VT Agency of Natural Resources and the List of Priority Infrastructure Projects developed annually by the VT Agency of Transportation.

Previously, in 2015, Elmore used a 7 vector model to evaluate the actions: 1) Action responds to significant hazard; 2) Likelihood of Funding; 3) Protects threatened infrastructure; 4) Socially and politically acceptable; 5) Technically Feasible; 6) Administratively realistic; 7) Reasonable cost to benefit; and 8) Environmentally sound. This process is simplified for the 2017 planning cycle.

4.3. 2017-2021 Mitigation Actions
Elmore’s hazard mitigation priorities have not changed and remain focused on fluvial erosion, flooding, and severe storms - Elmore’s predominant natural hazards. The list of 2017-2021 mitigation actions for Elmore is shown below. These actions relate to local plans and regulations, structures and infrastructure projects and natural systems protections. Education and awareness programs were considered and are currently not incorporated in this plan.
Elmore reviews and plans all actions annually, during town budget development process. While a significant disaster event may shift priorities, the Select board manages implementation to match funding, time and public support. Elmore uses a rigorous TCO (total cost of ownership) evaluation for all projects to determine the best cost/benefit options for the Town. (Note: Elmore Highway Prioritization Scheme: Appendix B provides the basic framework and ranking system Elmore uses to prioritize and manage all routine, emergency and basic maintenance activities for infrastructure, facilities and land use.

A new, simplified 2017-2021 action prioritization model uses 2 vectors: A simpler Cost/Benefit rating where; 1) COST is rated: Low (0 - $5,000), Medium ($5,001 - $15,000), High ($15,001 - $50,000) or Very High (> $50,000) and 2) BENEFIT is the sum projected factors: Resilience, Safety, Life Operating Cost and is rated: Low, Medium or High.

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation Action</th>
<th>Party to Initiate Action</th>
<th>Timeline</th>
<th>Possible Funding</th>
<th>Cost/Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seek funding to purchase generator for 1 town emergency shelter &amp; 1 town control center</td>
<td>Elmore Selectboard</td>
<td>2017-2018</td>
<td>FEMA, VT DEMHS</td>
<td>C: Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B: High</td>
</tr>
<tr>
<td>2</td>
<td>1) Regrade low drainage areas &amp; upsize 4 culverts on Elmore Mountain road.</td>
<td>Elmore Selectboard</td>
<td>2017-2018</td>
<td>Town Highway Budget, Better Roads program, VTrans, FEMA</td>
<td>C: Very high</td>
</tr>
<tr>
<td></td>
<td>2) NOTE: All regular 2017 Town culvert replacements will upgrade where needed to meet/ exceed Act64 requirements.</td>
<td></td>
<td></td>
<td></td>
<td>B: High</td>
</tr>
<tr>
<td>3</td>
<td>Review and Update All Regulations for comply with Act 64 (Water Quality Act)</td>
<td>Elmore Selectboard</td>
<td>2017-2018</td>
<td>Municipal Planning Grant</td>
<td>C: Low</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>B: High</td>
</tr>
<tr>
<td>4</td>
<td>Update Culvert Inventory</td>
<td>Elmore Selectboard</td>
<td>2018-2019</td>
<td>Better Road Program</td>
<td>C: Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B: High</td>
</tr>
<tr>
<td>5</td>
<td>Identify sanitary options for emergency shelters</td>
<td>Elmore Selectboard</td>
<td>2018-2019</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

**Hazards and Vulnerabilities Addressed by Mitigation Actions**

Actions 1 and 5 in the table above address all hazards listed in the plan. Actions 2, 3 and 4 address flooding, fluvial erosion and severe wind storms, and focus on mitigating vulnerabilities associated with impacts to public infrastructure, namely roads and culverts, as well water quality.

Elmore also considered other vulnerabilities identified in the risk assessment and at this time did not identify actions to mitigate these vulnerabilities. Power lines serving Elmore are owned and maintained by out-of-town utility companies and as such the Town of Elmore cannot commit to mitigation actions that would improve resiliency of the power line infrastructure. Likewise, the Town did not identify any appropriate public mitigation action for three existing private residencies located in the floodplain. Finally, the drifting of snow after heavy winter storms is addressed as part of regular winter storm clean-up performed by the town highway department and special mitigation actions are not needed.
Resolution

Approving the Elmore Local Hazard Mitigation Plan

The Select Board of the Town of Elmore find that:

A) The adoption of a multi-hazard plan is required as a condition for communities to remain eligible for future Federal Emergency Management Agency (FEMA) mitigation grant funds.

B) The Town of Elmore has prepared the Elmore Local Hazard Mitigation Plan in order to meet FEMA’s funding requirement, a copy of which is attached as Exhibit A and incorporated herein by reference.

C) The Select Board has reviewed and considered the Elmore Local Hazard Mitigation Plan.

D) The mitigation strategies and actions identified in the plan will be implemented only when funding sources have been identified and projects have been prioritized as outlined in the Plan.

NOW THEREFORE, BE IT RESOLVED BY THE SELECT BOARD OF THE TOWN OF ELMORE, A MUNICIPALITY OF THE STATE OF VERMONT, AS FOLLOWS:

Section 1. Based on the above findings, which are hereby adopted, the Elmore Local Hazard Mitigation Plan attached as Exhibit A is approved as the official Comprehensive Local Hazard Mitigation Plan for the Town of Elmore.

Section 2. This resolution shall become effective immediately upon adoption.

The foregoing Resolution is hereby adopted this ___ the day of ________________, 2017.

Select Board Chair ________________________________

Select Board Member ______________________________

Select Board Member ______________________________

Town Clerk received ________________________________
Appendix A: Maps
Appendix B: Elmore’s Highway Prioritization Ranking System

Elmore Road Improvement/Remediation: 5 year program
Preliminary Roadmap – Not a Schedule
V 2.0 8APR09

1. Identify and map known mud problem areas       Spring 09
2. Review slopes, grades, hydrology               Summer 09
3. Prelim prioritization (Severity + traffic impact) Summer 09
4. Special town meeting to approve Eng. Assessment Fall 09
5. Bid process for consulting Engineering Assessment Fall-Winter 09
6. Confirm priorities & remediation & estimate costs Winter 09
7. Prepare capital budget for town                 Winter 09
8. Special town meeting to approve Budget/Repairs   Mar 10
9. Bid Process                                     Spring 10
10. Begin remediation                               Summer 10
11. Continue based on budget approvals             2010-2015

ID Protocol:
1. TH = Town Highway ID
2. Site ID = Location by 911 Address
3. Name = Road Name

Priority Protocol: Two Key Factors determine Priority
1. Hazard Severity:
   a. Emergency – Unforeseen, catastrophic loss of access = 4
   b. Continuous – Chronic condition = 3
   c. Seasonal – Periodic instance; Mud, Snow, etc. = 2
   d. Intermittent – Single or random; Storm, Obstruction etc. = 1

   a. Sum: Over 50% of town residents and transient traffic = 4
   b. Sum: 25-50% of town residents and transient traffic = 3
   c. Sum: 10-24% of town residents and transient traffic = 2
   d. Sum: Less than 10% of town residents and transient traffic = 1

Over all Town Priority is sum of #1 and #2.