

Town of Roxbury, VT  
Local Mitigation Plan  
July, 2011

Prepared by Town of Roxbury and CVRPC

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# 1. Introduction

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this Local Mitigation Plan is to make the Town of Roxbury more disaster resistant.

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

Hazard mitigation strategies and measures alter the hazard by eliminating or reducing the frequency of occurrence, avert the hazard by redirecting the impact by means of a structure or land treatment, adapt to the hazard by modifying structures or standards, or avoid the hazard by preventing or limiting development.

## 2. Purpose

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

## 3. Community Profile

The Town of Roxbury is 40.6 square miles and is the southern-most town in Washington County. It is bordered by Northfield to the north, Brookfield (Orange County) to the east, Braintree (Orange County) to the south and Warren to the west. As stated in the *Roxbury Town Plan, 2001* Roxbury is “among the most rugged areas in the region.” Elevations range from 880 feet along the river valleys to 3,060 feet at the peak of Rice Mountain. The northern portion of town drains into the Winooski Watershed via the Dog River and the southern portion drains into the Connecticut Valley Watershed via the Third Branch of the White River.

Roxbury considers itself a bedroom community, as a majority of its residents commute to Montpelier and Barre for work. According to the *Roxbury Town Plan, 2008*, and based upon 2010 US Census estimates, Roxbury has a total population of 691 people living in approximately 400 housing units (35% of recorded housing units are classified vacant and/or seasonal dwellings).

The historic village settlement of Roxbury is located at the intersection of Route 12A and the Warren Mountain Road, and serves as the center of commercial, community life and essential services. The majority of residential development is located along or near to Route 12 and

Route 12 A as the “steep terrain poses limitations for many types of development due to problems including sewage disposal and soil erosion.” The Town Plan continues to state that “with over 20 peaks exceeding 2,000 feet in elevation, the physical characteristics of the town will continue to have a profound effect on its future development.” Development is limited in about ¼ of Roxbury as well, as it is designated State Forest lands. The majority of development is located on the valley floor due to the above mentioned development constraints. Roxbury does not currently have zoning bylaws; however, Roxbury does have inundation bylaws to prevent development from occurring in the floodplain or flood prone areas. The town predicts future development will continue to be low-density scattered residential development. At the time of writing this plan, there were no new residential or commercial developments planned.

Vermont Route 12A is the principle vehicular transportation corridor through Roxbury. A small section of Vermont Route 12 cuts across the northeast corner of Town, yet Town Highways constitute the majority of Roxbury’s roads. The Warren Gap Road is a heavily traveled road as it provides access to Warren and the Mad River Valley Ski Areas. The railroad is another major transportation corridor through Roxbury. The railroad runs parallel to Route 12A. The New England Central Railroad transports freight and Amtrak provides passenger transport. Neither service stops in Roxbury, but these providers stop in Randolph to the south or Montpelier in the north.

The Washington Electric Co-op provides electrical service to residential and commercial development along Route 12 in the northeast corner of Roxbury, the remainder of the town is serviced by the Central Vermont Public Service Cooperation. Plus a number of year round and seasonal dwellings either generate their own power or have independent systems. The Roxbury Village School’s water and sewage system serves the Union Congregational Church plus a few residences yet all other homes and businesses rely on individual or small-scale community wells and spring for their water supply and private waste water treatment systems. The Town of Roxbury has adopted a Sewage Ordinance to prevent water contamination by insuring adequate sewage disposal systems. Since 1991, 102 permits have been issued for new or renovated construction. As of July 1, 2007 the State of Vermont oversees all waste water permitting. Also, the Federal Insurance Administration has adopted the 100 year flood as the basis for floodplain management.

The Town of Roxbury participates in the National Flood Insurance Program, which provides flood damage relief to communities which enact ordinances regulating floodplain land use. While Roxbury has not adopted land use development bylaws, the Town has adopted Inundation Hazard Regulations.

Roxbury does not have a local police department and relies on the services of the Vermont State Police. The Town Constable assists the State Police and responds to nuisance situations but has no law enforcement authority. Fire protection is provided by the Roxbury Volunteer Fire Department, consisting of 8 active members with a Mutual Aid agreement from Northfield Fire Department. The Roxbury Fire Department also responds to emergency medical situations in conjunction with the Northfield Ambulance Service if needed.

The Town of Roxbury has an approved Rapid Response Plan that was adopted in 2007. The Roxbury Village School and the Congregational Church are designated emergency shelters.

The Town Plan, adopted in 2008, includes discussion, goals, and objectives in regards to flooding, groundwater protection, and emergency services in the *Physical Features and Cultural and Natural Resources* and *Transportation* elements.

## **4. Planning Process and Maintenance**

### ***4.1 Planning Process***

The Central Vermont Regional Planning Commission (CVRPC) and the Roxbury Planning Commission coordinated the Roxbury Local Mitigation Plan process. CVRPC contacted Kim Livellara from the Roxbury Planning Commission, and sent her Town specific hazard mitigation materials for her review. After assessing the material, Ms. Livellara and CVRPC staff met with members of the community. An initial meeting was held in Roxbury on September 9, 2008, while a follow up meeting was held February 11, 2011 in order to gain an inventory of the Town's vulnerability to hazards and its current and future mitigations programs, projects and activities. Input was received from:

- Kim Livellara - Planning Commission chairperson
- Claire Chomentowski - Planning Commission Member
- Linda Berg-Maney - Planning Commission Member
- Ed Dickinson - Planning Commission Member
- Tim Martin – Senior Fire Chief
- Clare Rock – CVRPC
- Jen Mojo - CVRPC

The meeting indicated that the Town is most vulnerable to flooding, water supply contamination and rail road transport accident

The draft plan was made available to the public for comments at the Roxbury Town Clerk's office. The Town Clerk will be responsible for collecting and considering comments. The notice of the draft update is also available on the CVRPC blog until the plan is submitted to FEMA for final approval. Comments sent to CVRPC will be processed by the Assistant Planner and attached as an appendix. An announcement of the draft update was also issued in the CVRPC newsletter, which reaches over 150 people in the Region's 23 towns including the surrounding towns of Northfield and Warren. Once the plan is conditionally approved by FEMA, the plan will go before the Select Board for adoption. The draft plan will also be shared with the fire department and road department, and at local meetings with other local, regional or state officials. During future updates, additional stakeholders who provide service to the jurisdiction and major business owners will be invited to the meetings.

The Roxbury Local Mitigation (PDM) Plan was originally drafted as an annex for the Central Vermont Regional Hazard Mitigation. However, the Regional Plan expired before the submission and adoption of the Roxbury Annex. The Roxbury Local Mitigation Plan will be submitted to FEMA as a standalone plan.

### **Existing Mitigation Programs, Projects and Activities**

The ongoing or recently completed programs, projects and activities are listed by mitigation strategy and were reviewed for the development of the plan. The Town Plan, 2010 Town Report, CVRPC's past Regional Mitigation Plan, and Basic Emergency Operations Plan, and past newspaper articles were reviewed for pertinent information. The Dog River Corridor Plan, Ayers Brook Corridor Plan, Northfield All Hazards Mitigation Plan, VT State Hazard Mitigation Plan and past geomorphic assessments of the Dog River were also reviewed for information regarding flooding and future mitigation project ideas.

#### Community Preparedness Activities

- Rapid Response Plan
- Capital Equipment Plan

#### Insurance Programs

- Participation in NFIP

#### Land use Planning/Management

- Sewage Ordinance, 2007
- Roxbury Town Plan, 2008
- Geomorphic assessment – River Corridor Plan – April 2009
- Inundation Hazard Area Regulation - 2009

#### Hazard Control & Protective Works of Infrastructure and Critical Facilities

- Maintenance Programs
  - Culvert Survey - 2007
  - Five Year Bridge Plan - ongoing
- Dry Hydrants
- Red Cross trained volunteers

#### Public Awareness, Training & Education

- CPR Training maintained every 2 years
- School Fire Safety Program

## ***4.2 Plan Maintenance***

The Roxbury Local Hazard Mitigation Plan will be updated and evaluated annually at a September Select Board meeting. Updates and evaluation by the Select Board will also occur within three months after every federal disaster declaration and as updates to town plan/zoning and river corridor plans come into effect. The plan will be reviewed by the Select Board, Town Clerk, Emergency Manager and public at the abovementioned September select

board meeting. CVRPC will help with updates or if no funding is available, the Planning Commission Chair and Emergency Manager will update the plan.

The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, town newsletter and CVRPC newsletter and blog inviting the public to the scheduled Select Board (or specially scheduled) meeting. These efforts will be coordinated by the Planning Commission Chair and Emergency Manager.

Updates may include changes in community mitigation strategies; new town bylaws, zoning and planning strategies; progress of implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities. If new actions are identified in the 5 year interim period, the plan can be amended without formal re-adoption during regularly scheduled Select Board meetings.

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

## 5. Risk Assessment

### 5.1 Hazard Identification and Analysis

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

Hazard	Likelihood <sup>1</sup>	Community Vulnerability <sup>2</sup>	Worst Threat
Avalanche/ Landslide	Low	No	
Dam Failures	Low	No	
Drought	Low	No	
Earthquake	Low	No	
Extreme Cold	High	No	
Flash Flood	Med	No	

<sup>1</sup> High likelihood of happening: Near 100% probability in the next year.

Medium likelihood of happening: 10% to 100% probability in the next year or at least once in the next 10 years.

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

<sup>2</sup> Does the hazard present the threat of disaster (Yes)? Or is it just a routine emergency (No)?

Flood	High	Yes	✓
Fluvial Erosion	Low	No	
High Wind	Med	No	
Ice Jam	Low	No	
Hurricane	Low	No	
Structure Fire	Med	No	
Tornado	Low	No	
Water Supply Contamination	Med	Yes	✓
Wildfire/Forest Fire	Med	No	
Winter Storm / Ice Storm	High	No	
Other – Railroad transport accident	Low	Yes	✓

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

- Flooding
- Water Supply Contamination
- Railroad Transport Accident

Due to the frequent and severe nature of flooding events, Roxbury feels flooding is the worst natural hazard within the Town and will focus on mitigation efforts to reduce the impacts from flooding events.

Non worst threat hazards include:

- High Winds
- Extreme Cold/Winter Storm/Ice Storm
- Wild Fire/Forest Fire

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

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

	hazard.		<p>no injuries or fatalities.  <u>Moderate:</u> Scattered major property damage (more than 50% destroyed); some minor infrastructure damage; wider geographic area (several communities) essential services are briefly interrupted; some injuries and/or fatalities.  <u>Severe:</u> Consistent major property damage; major damage to public infrastructure (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and fatalities.</p>		<p>probability within the within the next year or less than once in the next 10 years.</p>
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## 5.2 Worst Threat Hazards

### Flooding/Flash Flooding/Fluvial Erosion

Recent History of Occurrences (within Central Vermont, town specific data is not available):

- Aug 28, 2011 – DR 4022
- May 28, 2011 – DR 1995
- March 6, 2011
- July 21, 2008 – DR 1790
- August 9, 2007 – DR 1715
- December 2006
- September 16, 1999 – DR 1307
- June 17, 1998 – DR 1228
- July 17, 1997 – DR 1184
- February 2, 1996 – DR 1101
- August 6, 1995 – DR 1063
- March 11, 1992 – DR 938
- September 1989 – DR840

The northern portion of the Town of Roxbury drains into the Winooski Watershed and the southern portion drains into the White Watershed. Roxbury does participate in the National Flood Insurance Program (NFIP) and has adopted a flood hazard bylaw. Flooding is the more commonly occurring natural hazard and is more likely to reoccur compared to other natural disasters.

Based on the results of overlaying Roxbury's current Flood Insurance Rate Maps (FIRM) with the location of E911 points, 78 properties and 5 structures are located within the National Flood Insurance Program's designated 100-year floodplain. The estimated loss for a severe flooding

event for all properties located within the Roxbury 100-year floodplain is approximately \$10,025,547 based on the median grand list property value. There are no repetitive loss structures in the floodplain. The structures located in the floodplain are primarily residential. The Town Garage is located on the edge of the floodplain and was almost flooded during the March 2011 flood event. As more specific data regarding the structures becomes available, it will be added to the plan. At the time of writing this plan, there were no residential or commercial developments planned in the floodplain or in flood prone areas in Roxbury. Roxbury does have an inundation hazard bylaw which prevents future structures from being built in flood prone areas.

Historical channel management activities, floodplain encroachments, adjacent land use practices and/or changes in watershed hydrology associated with conversion of land cover and drainage activities, within and beyond the NFIP floodplain, have frequently been documented to have devastating consequences. The Hazards Analysis Map identifies areas and structures in the 100 year floodplain. The Town is interested in reducing the damage of flood events by educating its residents on the NFIP regulations and standards. The Town would also like to become more knowledgeable of non compliant structures in the community. Roxbury would like to work with ANR on how to better identify current non compliant structures and bring these structures into compliance, as well as learn how to prevent non compliant structures in the future.

The Dog River starts in Roxbury and flows north to converge with the Winooski River in Montpelier. The Dog River provides the greatest threat of flooding in Roxbury as it flows through the center of town and along the railroad tracks. A corridor plan of the Dog River was developed in 2008 and identified problem areas, assessed river conditions and provided ideas for future restoration and mitigation projects. The map of project locations and table of descriptions are attached at the end of this plan, along with a map of current fluvial erosion conditions. The fluvial erosion map indicates areas where the river banks in Roxbury have “high” to “extreme” rates of movement and are likely to change in shape in size. Development in areas of high fluvial erosion can lead to increased and more extreme flooding events, along with greater and more costly damages.

Overall, the corridor plan identified the stretches of the Dog River in Roxbury as in “fair” condition. The “fair” rating was assigned due to several factors which degrade the River’s health:

- Railroad beds and banks along the River cut off access to natural floodplain
- Inadequate riparian buffers (<25 ft)
- Higher rates of erosion in residential areas due to increased stormwater runoff
- Channelization
- Floodplain encroachment
- Bridge span inadequate and too constricting
- Fluvial erosion

The report also identified bridges which are constricting the river at bends. Structures over bends are more likely to cause flooding due to the fact that the velocity of the water is higher

and banks are more susceptible to erosion. The corridor plan recommends a widening project of moderate priority for one rail bridge on river segment M21 in Roxbury, in addition to the projects listed at the end of the plan. Additional bridges which are of lower priority are located on Roxbury Rd and Warren Mtn. Rd.

Roxbury has experienced floods of greater magnitude. In 1927, a 250 year flood inundated the entire village, flooded a freight train stranded at the Roxbury landing, and damaged or destroyed thirty-five bridges in the town. There have been many smaller floods since then. As recently as 2006/2007, there have been floods that have washed out roads and damaged culverts. The December 2006 event included major flooding of the fish hatchery, home and driveway damage, a cemetery under water and a large section of 12A destroyed.

Most recently during Tropical Storm Irene, several roads, bridges and culverts were destroyed by flood waters from storm water runoff and the Dog River. Roads/culverts/bridges still needing repairs are located on:

- Bull Run Rd – 12 foot culvert destroyed
- Braintree Hill Rd – Road washout
- Carrie-Howe Rd – Bridge washed out
- Warren Mountain Rd – Bridge abutment washed out
- Oxbow Rd – Road washed out
- Route 12A – Road washed out

Hazard	Location	Vulnerability	Extent	Impact	Probability
<b>Flooding</b>	Route 12A, Bull Run Rd, Braintree Hill Rd, Carrie- Howe Rd, Warren Mtn Rd, Oxbow Rd, fishery	Route 12A roads, bridges, rail bridges and culverts	Irene- 8+ ft above flood stage in Northfield Falls (closest gauge)	Data gap from Irene damages other damages \$500,000 for Town Garage land/ Equipment \$400,000 per bridge	HIGH

### [Railroad Transport Accident](#)

The Central Vermont Railroad runs through Roxbury from north to south along the valley floor. Rail activity includes both Amtrak passenger service from Boston to Burlington and cargo transport, to and from Canada. Cargo transport includes a variety of freight including hazardous materials including oil and propane.

In 2009, a freight train struck a UPS truck at the intersection of Route 12A and Oxbow Road. According to news reports, the railroad crossing was marked with a railroad crossing sign, but there are no lights or crossing bars. The train had one engine and twelve freight cars. Upon impact, the freight train traveled approximately 900 feet before coming to a stop. Damages to the freight train were minimal; however, the UPS truck was totaled. Damage and emergency service related costs were roughly \$100,000.

While the rail system in Roxbury is well delineated, sharp corners and blind intersections, with both the town and highway road systems and also the VAST could potentially lead to a disaster. These areas are highlighted on the Hazard Analysis Map.

Hazard	Location	Vulnerability	Extent	Impact	Probability
<b>Railway Transport Accident</b>	1,000' buffer (500' either side of rail)  floodplain area	Residential Development, Municipal buildings.	Severe	\$ 100,000	Low

### Water Supply Contamination

All development in Roxbury is dependent on groundwater and private wells for drinking water. As mentioned previously, the majority of development is located on the valley floor, in or near the floodplain and in or near the railroad tracks. Additionally many of the buildings were built prior to 1900 and no-doubted have aging wastewater systems. The water supply could become contaminated by either a flooding event, a railroad transport accident resulting in a hazardous materials spill or by aging waste water treatment systems.

Groundwater is largely derived from precipitation which has infiltrated and percolated through the soil. Roxbury is presently, and will likely continue to be, totally dependent upon groundwater sources (e.g. springs, shallow and deep wells) for its domestic water supply. Therefore, the protection of both the *quality* and *quantity* of these resources is critical to the future of the town and its residents. Groundwater quality may be impacted directly from development activities which contribute various pollutants, e.g. landfill leachate, gas/oil leaks, sewage and industrial wastes. The quantity of water that recharges groundwater sources can also be diminished by increases in impervious lands such as parking lots, roads and buildings. Areas of concern are highlighted on the Hazards Analysis Map.

Hazard	Location	Vulnerability	Extent	Impact	Probability
<b>Water supply contamination</b>	- Downtown Village - Along Railroad - Development within Floodplain	Residential and Municipal buildings, Summer camp	Severe	\$ 15,000	Medium

## 5.3 Non Worst Threat Hazards

### High Winds

Thunderstorms can generate high winds and down hundreds of large trees within a few minutes. The State can also experience tornadoes, which are capable of damaging or destroying structures, downing trees and power lines and creating injuries and death from collapsing buildings and flying objects. Tornadoes are less common than hail storms and high winds, but have occurred throughout Vermont. Across the State, however, 34 tornadoes have been recorded between 1950 and 1999, injuring 10 people and causing over \$8.4 million dollars in estimated property damage. Nearly all of these incidents occurred from May through August with most of occurring in the afternoon. The Northfield Ridge, which borders Roxbury has been scoped for wind power development; however, plans to build turbines have been a low priority due to low power generation and scenic view issues. In both TS Irene and the May 2011 severe storm events, Roxbury did not suffer any damage from wind. To date, no high wind events have occurred in Roxbury.

Hazard	Location	Vulnerability	Extent	Impact	Probability
High Winds	Town Wide	Power lines, trees, structures	Northfield Ridge avg Speeds 5-21 mph; depends on events	Depends on severity of event	Medium

### Extreme Cold/Winter Storm/Ice Storm

#### History of Occurrences (county wide)

Snow and/or ice events occur on a regular basis. Recent significant events have included:

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

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

One of the major problems associated with ice storms is the loss of electrical power. Major electric utility companies have active, ongoing programs to improve system reliability and protect facilities from damage by ice, severe winds and other hazards. Typically, these programs focus on trimming trees to prevent encroachment of overhead lines, strengthening vulnerable system components, protecting equipment from lightning strikes and placing new distribution lines underground.

Other major problems include closed roads and restricted transportation.

By observing winter storm watches and warnings, adequate preparations can usually be made to lessen the impact of snow, ice and sleet, and below freezing temperature conditions on the Town of Roxbury. Providing for the mass care and sheltering of residents left without heat or electricity for an extended time and mobilizing sufficient resources to clear broken tree limbs from roads, are the primary challenges facing community officials. Roxbury should plan and prepare for these emergencies. That planning and preparedness effort should include the identification of mass care facilities and necessary resources such as cots, blankets, food supplies and generators, as well as debris removal equipment and services. Sheltering areas in Roxbury include the elementary school, church and camp. The Town encourages residents who are in remote locations to be equipped with generators and backup fuel supplies in the event of prolonged power outages and travel restrictions.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Extreme Cold/Winter or Ice Storm in conjunction with power failure	Town Wide	Elderly & handicapped populations, remote structures, old/under insulated structures, utilities, trees	Below freezing and severe wind chill factor for multiple days; depends on severity of event; 18+” snow in March 2011 storm	Depends on severity – additional sheltering/ plowing/ emergency services costs for town	Med/High

### Wild Fire/Forest Fire

FEMA indicates there are three classes of wild land fires – surface fires, ground fires and crown fires, with the most common type indicated as a surface fire. Surface fires burn slowly along the forest floor, killing and damaging trees. Ground fires burn on or below the forest floor and are usually caused by lightning. Crown fires move quickly by jumping along the tops of trees. Crown fires can spread quickly during windy conditions. In Roxbury, there have been no known occurrences of wildfires; however, changing land use patterns and weather conditions may increase Roxbury’s vulnerability. The rural nature and vast tracts of forested land can make Roxbury susceptible to forest fires. During rare drought occurrences, fire danger may be high.

The State of Vermont does have a Forest Management plan in place which addresses forest fire concerns. The 2010 State Forest Management Plan includes several goals regarding forest fire prevention. The Plan states that although the risk of forest fire is low in the State of Vermont, that the State still performs controlled burns on a small during the spring season. To help prevent local forest fires, the State works with local planning commissions to develop Community Wildlife Protection Plans. These plans help towns to identify and mitigate wildfire risk. A common mitigation measure prescribed in the plan is through controlled burns with onsite State support.

The Forest Division also runs the Town Forest Fire Warden program. This program requires towns to have appointed fire wardens. The forest fire program focuses on prevention, fire awareness and fire fighter safety.

Hazard	Location	Vulnerability	Extent	Impact	Likelihood
Wildfire	Town Wide – areas outside Village development	Large Parcels of forested land, homes near urban forest interface, power lines	25% of Roxbury (State Forest Lands)	Depends on severity of event	Medium

## 6 Mitigation

### ***6.1 Town Plan (2008) Goals that Support Local Mitigation***

- Maintain, preserve and enhance Roxbury’s natural and cultural resources. (Physical Features and Cultural and Natural Resources Goal)
- Ensure safe and dependable roadways for the residents of Roxbury at a reasonable cost. (Transportation Goal)

The Roxbury Town Plan is expected to be updated in 2016 at which time additional mitigation goals could be added. Additional mitigation goals could include:

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

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

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

Hazard mitigation is a relatively new planning topic to Roxbury. Over the course of the next five years, Roxbury will incorporate more mitigation planning into their daily planning activities and projects. The mitigation goals and strategies outlined in this Local Mitigation Plan are the first steps in making Roxbury more disaster resistant. The hazards identified in this plan cause the greatest impacts and damage and are the priority hazards for the Town of Roxbury. In order to

have continuous achievement of mitigation goals and implementation mitigation strategies, the Town will spend time each year assessing progress of and future funding sources for the outlined mitigation strategies. This session can be performed during Town Meeting Day or an annual session of another set date can be held during a public Select Board Meeting.

## ***6.2 Proposed Hazard Mitigation Programs, Projects and Activities***

Hazard mitigation programs, projects and activities that were identified for implementation at the Town PDM meeting:

### Flooding

- Develop a post flood clean-up, decontamination and recovery plan/procedure
- Replacement and upgrade of culverts and bridges on – Route 12A, Bull Run Rd, Braintree Hill Rd, Carrie- Howe Rd, Warren Mtn Rd, and Oxbow Rd
- Flood proofing the Town Garage
- Projects identified in Dog River Corridor Plan – see Dog River Corridor Plan Projects Table
- Develop prioritized list of culvert/bridge replacement and upgrade projects

### Water Supply Contamination

- Develop loan/grant program for Town property owners to upgrade existing septic systems
- Purchase and have available an adequate number of standby generators for use on individual existing wells in town

### Railroad Transport Accident

- Plan for public protective actions evacuation – sheltering available at the Roxbury Village School in the center of town.
- Conduct a detailed study of the impact of railroad transport accidents on the Town
- Install drop down bars and flashing signals at the most dangerous intersections
- Provide educational, explanatory materials regarding the hazardous materials risks to residents and property owners in the town

### NFIP

- Prepare and distribute or make available NFIP, insurance and building codes, explanatory pamphlets or booklets
- Identify and become knowledgeable of non-compliant structures in the community
- Work with ANR to analyze how to prevent non compliant structures in the future and bring existing non compliant structures into compliance

The Hazard Mitigation Activities Matrix (Attached) lists mitigation activities in regards to local leadership, possible resources, implementation tools, and prioritization. Prioritization was based upon the economic impact of the action, the Community's need to address the issue, the action's cost, and the availability of potential funding. The action's cost was evaluated in relation to its benefit as outlined in the STAPLEE guidelines. All flooding mitigation strategies were reviewed in light of the most recent flooding events.

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

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

#### Attachments

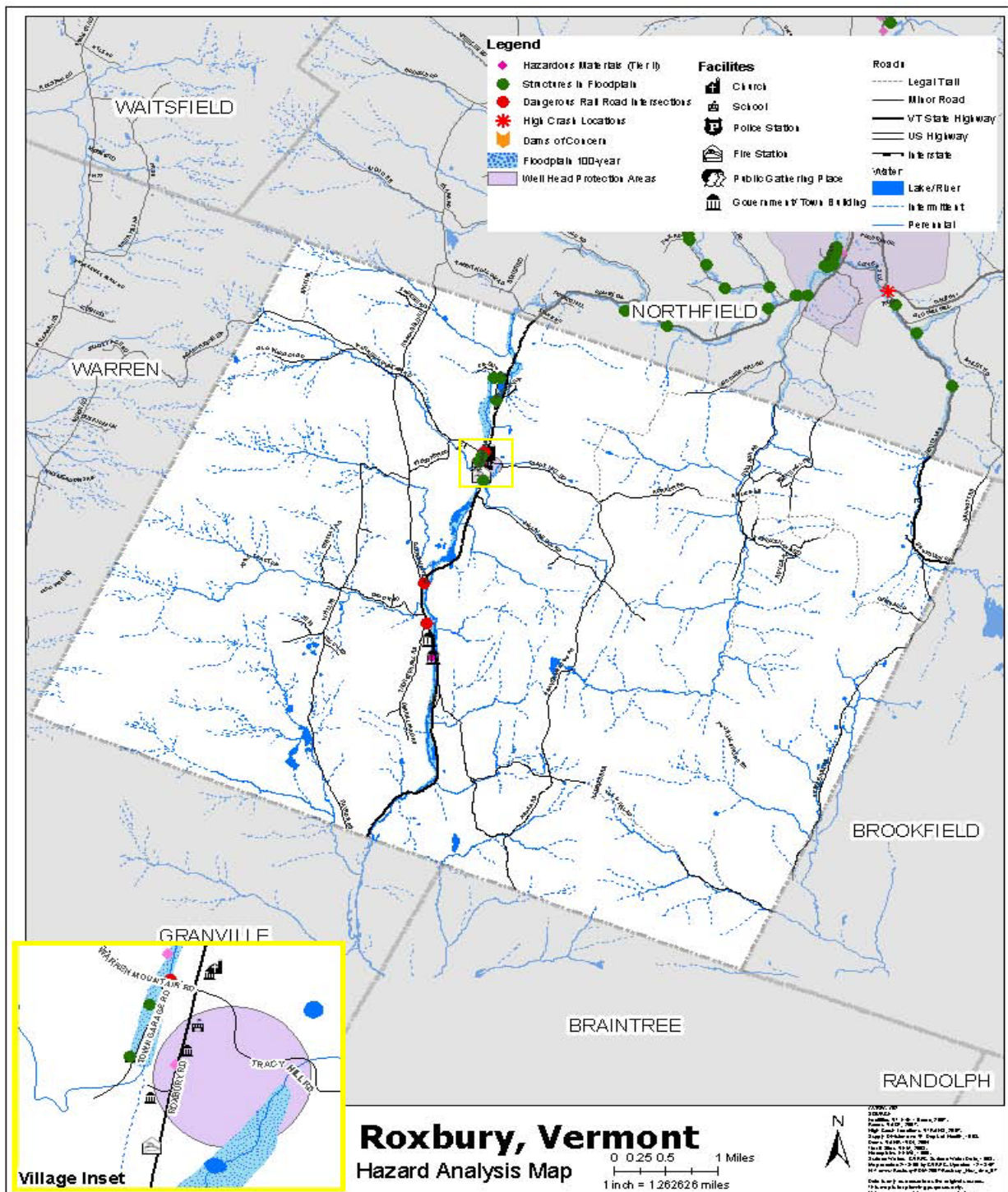
- Hazard Mitigation Strategy Matrix
- Hazard Analysis Map
- Dog River Corridor Plan Projects Table and Map
- Dog River Corridor Plan Fluvial Erosion Hazard Zone Map
- Certificate of Adoption

# Hazard Mitigation Activity Matrix

Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
Plan for protective action in town	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	High	<ul style="list-style-type: none"> <li>• VT DEC</li> <li>• Municipality</li> </ul>	1 year
Provide educational, explanatory materials regarding hazardous materials, risks to residents and property owners in town	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Low	<ul style="list-style-type: none"> <li>• CVRPC</li> <li>• VEM</li> </ul>	3- 4 years
Install drop down bars at most dangerous intersections	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Med	<ul style="list-style-type: none"> <li>• Municipality</li> <li>• Road commissioner</li> </ul>	2-3 years
Replacement and upgrade of culverts and bridges on – Route 12A, Bull Run Rd, Braintree Hill Rd, Carrie-Howe Rd, Warren Mtn Rd, and Oxbow Rd	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> <li>•Road Foreman</li> </ul>	High	<ul style="list-style-type: none"> <li>• Municipality</li> <li>• Road Crew</li> <li>• VAOT</li> <li>• HMGP</li> </ul>	1-2 years
Develop prioritized list of culvert/bridge replacement and upgrade projects	<ul style="list-style-type: none"> <li>•S.B</li> <li>•Road Foreman</li> <li>•CVRPC</li> </ul>	High	<ul style="list-style-type: none"> <li>• Municipality</li> <li>• HMGP</li> </ul>	1-2 years
Flood proof Town Garage	<ul style="list-style-type: none"> <li>•Road Foreman</li> <li>•S.B</li> </ul>	Med	<ul style="list-style-type: none"> <li>• HMGP</li> <li>• EMGP</li> </ul>	3 years
Purchase and have available an adequate number of standby generators for use on individual wells in town	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Med	<ul style="list-style-type: none"> <li>• Municipality</li> </ul>	2-3 years
Prepare and distribute or make available NFIP insurance and building codes, explanatory pamphlets or booklets	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	High	<ul style="list-style-type: none"> <li>• NFIP</li> <li>• VHA</li> </ul>	1-2 years
Identify and become knowledgeable of existing NFIP non-compliant structures	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	High	<ul style="list-style-type: none"> <li>• Roxbury Fire Department</li> <li>• NFIP</li> </ul>	1-2 years

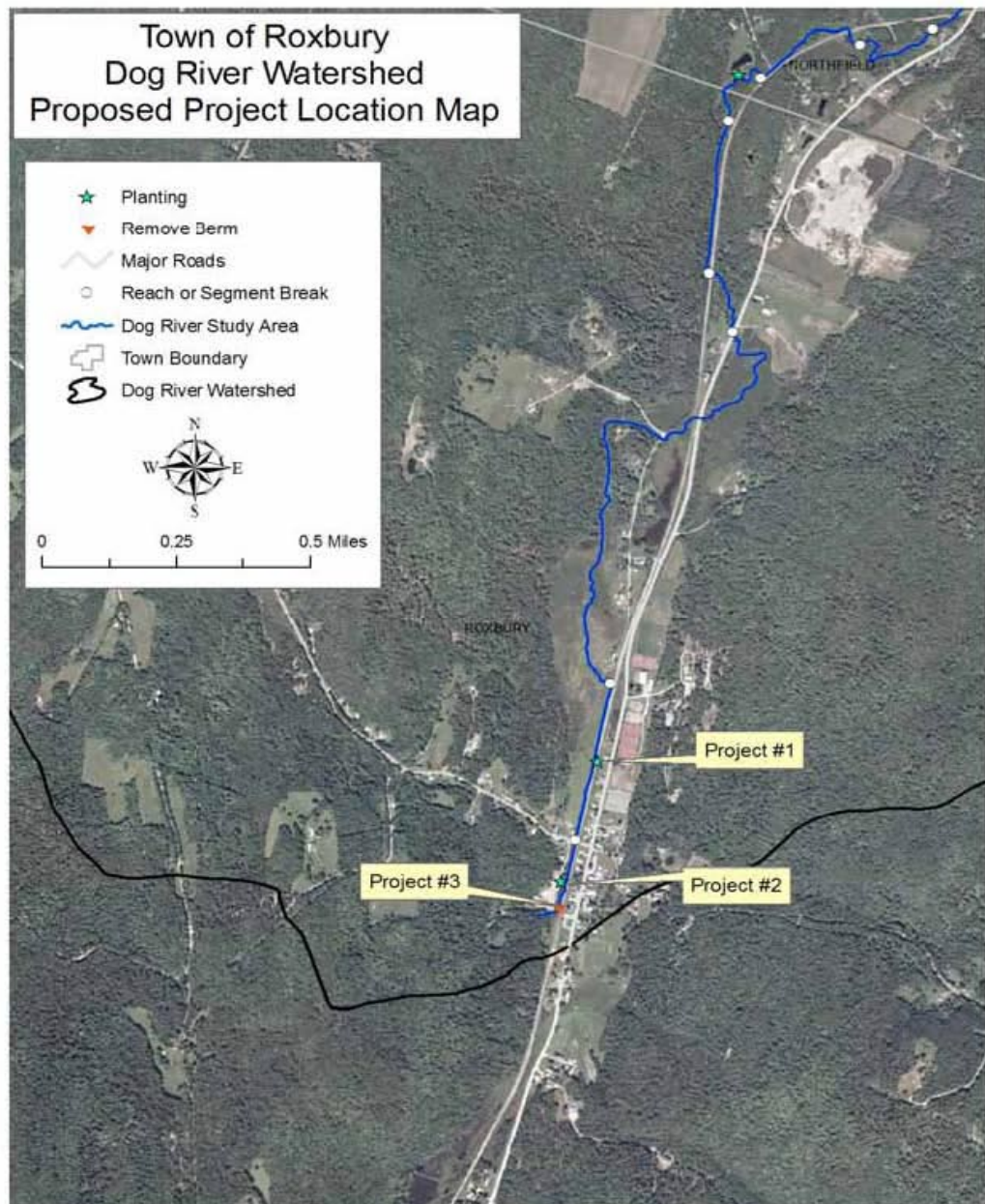
Work with ANR to analyze how to prevent non compliant structures in the future and bring existing non compliant structures into compliance	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>• Roxbury Fire Department</li> <li>• NFIP</li> </ul>	2-3 years
Conduct a detailed study of the impact of railroad transport accidents.	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Low	<ul style="list-style-type: none"> <li>• CVRPC Transportation Advisory</li> </ul>	3-4 years
Develop an evacuation plan for the town in event of disaster.	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>• CVRPC EM Coordinator</li> <li>• Municipality</li> </ul>	2-3 years
Develop a post flood clean-up, decontamination and recovery plan / procedure	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>• VT DEC</li> <li>• Municipality</li> </ul>	2-3 years
Develop loan / grant program for Town property owners to upgrade existing septic systems	<ul style="list-style-type: none"> <li>•P.C.</li> <li>•S.B.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>• VT DEC</li> <li>• Municipality</li> </ul>	2-3 years
Projects identified in Dog River Corridor Plan – see Dog River Projects Table	<ul style="list-style-type: none"> <li>•S.B</li> <li>•P.C.</li> <li>•VT ANR</li> </ul>	High	<ul style="list-style-type: none"> <li>• ANR</li> <li>• Municipality</li> <li>• FMA</li> </ul>	2 years

# Hazard Analysis Map

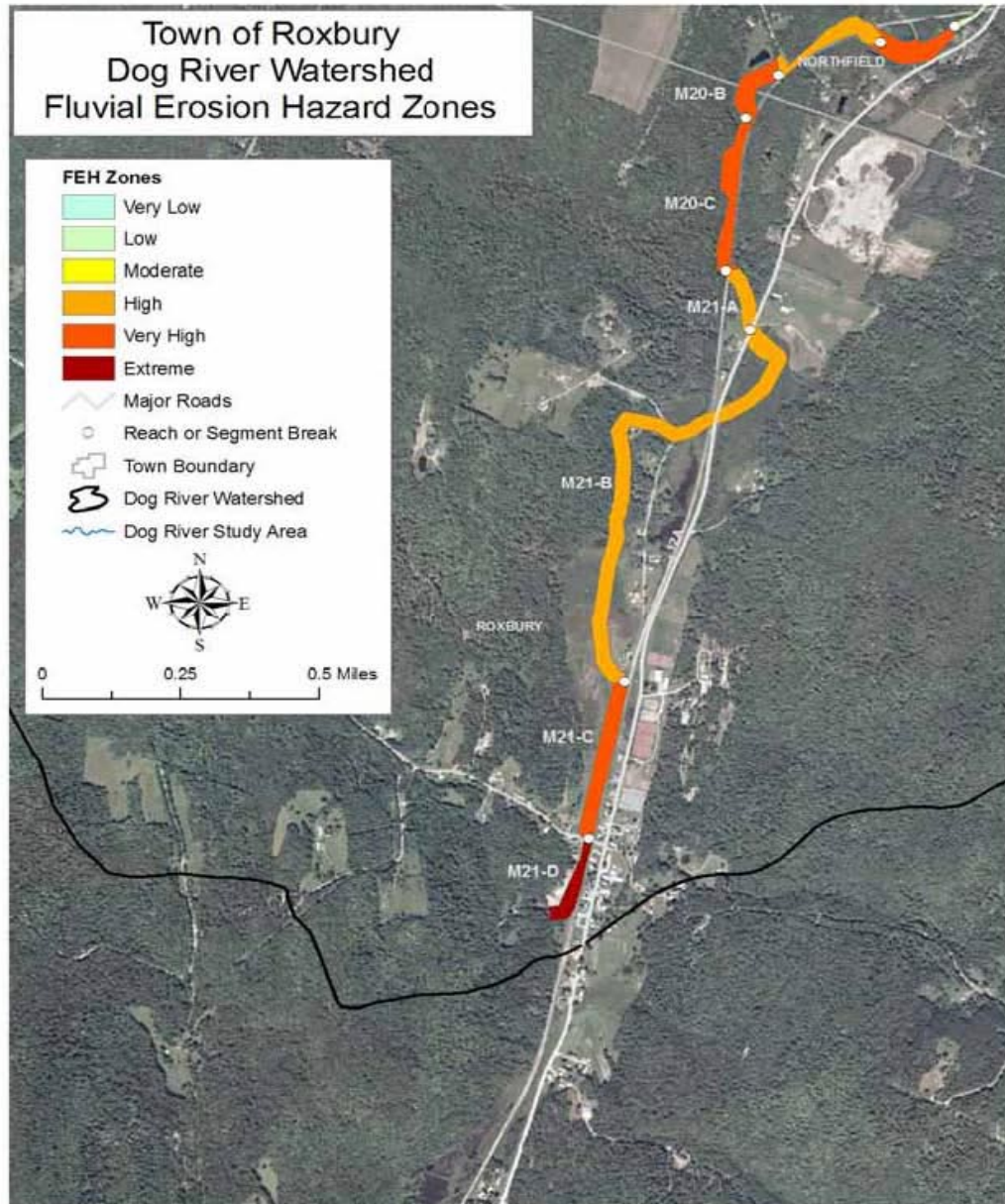


# Dog River Corridor Plan Project Table and Map

Table 7.3. Dog River Site Level Opportunities for Restoration and Protection – Town of Roxbury								
Project #, Reach	Condition and Channel Evolution Stage	Site Description Including Stressors and Constraints	Project or Strategy Description	Technical Feasibility and Priority	Other Social Benefits	Costs	Land Use Conversion	Potential Partners
#1 M21-C	Fair Not Evaluated	Recently relocated section of channel along Roxbury Road	Improve riparian vegetation	Moderate priority. Number of landowners unknown	Improved habitat and geomorphic stability	Relatively low cost for native plant materials and labor	Field to forested buffer	Town of Roxbury
#2 M21-D	Fair F III	Runs close to railroad and Town Garage	Improve near bank vegetation and riparian buffer	Low priority due to limited room for planting	Improved habitat and geomorphic stability	Relatively low cost for native plant materials and labor	Commercial to forested buffer	Town of Roxbury, Landowners
#3 M21-D	Fair F III	Runs close to railroad and Town Garage; railroad is heavily bermed	Remove berms	Low priority as berms are protecting the railroad	Restore floodplain access, but still would be limited by railroad	Moderate to high costs	None	Town of Roxbury, railroad



**Figure 7.6 Proposed project location map for the Town of Roxbury, Dog River watershed**



**Figure 7.3. Draft Fluvial Erosion Hazard Zone Map for the Town of Roxbury - Dog River watershed**

## Certificate of Adoption

The Town of Roxbury  
Select Board  
A Resolution Adopting the Local Mitigation Plan  
\_\_\_\_\_, 2011

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

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

WHEREAS, a duly-noticed public meeting was held by the Town of Roxbury Select Board on \_\_\_\_\_, 2011 to formally adopt the Roxbury Local Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Roxbury Select Board adopts the Roxbury Local Mitigation Plan.

\_\_\_\_\_  
Chair of Select Board

\_\_\_\_\_  
Member of Select Board

ATTEST

\_\_\_\_\_  
Roxbury Clerk

CERTIFICATE OF ADOPTION


The Town of Roxbury  
Select Board  
A Resolution Adopting the Pre-Disaster Mitigation Plan  
January 2, 2012

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

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

WHEREAS, a duly-noticed public meeting was held by the Town of Roxbury Select Board on January 2, 2012 to formally adopt the Roxbury Pre-Disaster Mitigation Plan;

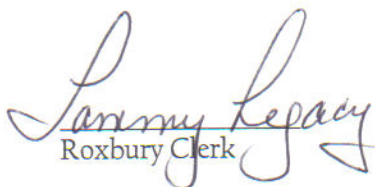
NOW, THEREFORE BE IT RESOLVED that the Roxbury Select Board adopts the Roxbury Pre-Disaster Mitigation Plan Update.

  
Shawn Neun, Chair

  
Stephen Twombly

  
David McShane

ATTEST

  
Jeremy Legacy  
Roxbury Clerk