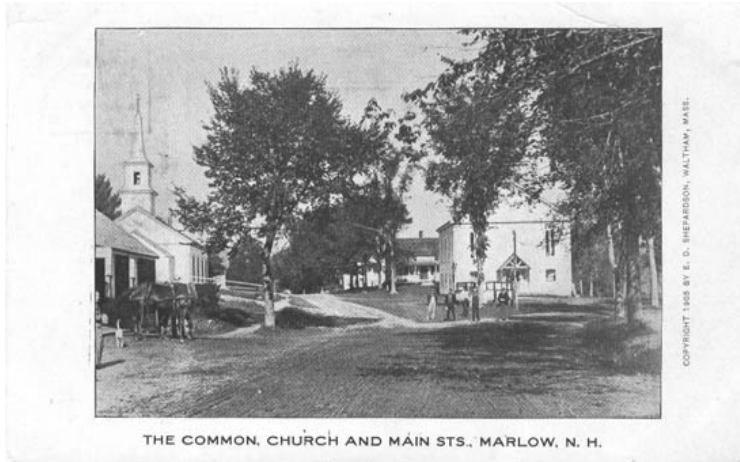


MARLOW HAZARD MITIGATION PLAN UPDATE 2013
Marlow, New Hampshire

FEMA Final Approval_____



www.rootsweb.com



<http://www.marlow-nh.org/main.html>

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TABLE OF CONTENTS

Executive Summary iii

Hazard Mitigation Strategies iv

Incorporation into Other Planning Mechanisms iv

Chapter I: Introduction 1

 Background 1

 What is Hazard Mitigation? 1

 Authority 1

 Funding Source 1

 Purpose 1

 Scope of the Plan 1

 Methodology 2

 Plan Updates 3

 Resources Used in Plan Preparation 4

 Committee Meetings and Public Participation in the Planning Process 4

 Acknowledgements 4

 Hazard Mitigation Goals 5

Chapter II: Community Profile 6

 Town Overview 6

 Location Map 6

 Disaster Risk 6

 Existing Land Use 7

 Development Trends 7

 Development in Hazard Areas 8

 National Flood Insurance Program (NFIP) 8

 Continued Compliance with NFIP Requirements 9

Chapter III: Hazard Identification and Assessing Vulnerability 10

 List of Hazards 10

 Flooding- Disaster Declarations 11

 Flooding- Localized- Low-Med Risk (Riverine Flooding- Med-High Risk) 11

 Erosion- Low-Medium Risk 12

 Drought- Low Risk 13

 Extreme Heat- Low Risk 13

 Wildfires- Low-Medium Risk 14

 Lightning- Low-Medium Risk 14

 Tornados (Fujita Scale given if known)- Low Risk 15

 Hurricanes (Category given if known) and Tropical Storms- Low-Medium Risk 15

 Earthquakes (Magnitude given if known)- Low Risk 16

 Severe Wind- Low-Medium Risk 17

 Extreme Winter Weather- Medium Risk 17

 Hazardous Material Spills- Low Risk 19

 Snow Avalanche- Low Risk 19

 Subsidence- Low Risk 19

 Radon- Low Risk 19

 Dams- Medium Risk 20

 Map of Dams 21

 Map of Culverts and Bridges 21

Chapter IV: Assessing Probability, Severity and Risk 23

Risk Assessment.....	23
Chapter V: Critical Facilities	24
Category 1 - Emergency Response Facilities & Services.....	25
Category 2 - Non Emergency Response Facilities.....	25
Category 3 - Facilities/Populations to Protect.....	25
Category 4 - Potential Resources	25
Chapter VI: Existing Mitigation Strategies.....	27
Existing Mitigation Strategies and Proposed Improvements.....	27
Chapter VII: Proposed Mitigation Strategies.....	31
New Programs or Activities	31
Location Specific Programs or Activities.....	31
Prioritization of Proposed Mitigation Strategies	33
STAPLEE Feasibility Ranking Matrix.....	34
Chapter VIII: Prioritized Implementation Schedule and Action Plan.....	35
Chapter IX: Adoption, Implementation, Monitoring & Update	36
Adoption.....	36
Implementation of the Plan through Existing Programs.....	36
Master Plan.....	36
Zoning Ordinance and Regulations	36
Continued Public Involvement	36
Monitoring & Updates.....	37
Certificate of Adoption.....	38

Appendix A: Hazard Descriptions
Appendix B: Risk Assessment Methodology
Appendix C: Resources
Appendix D: Hazard Mitigation Resource Profiles
Appendix E: Document of the Planning Process
Appendix F: Wildfire of 1941 Map
Appendix G: Project Status Additions, Amendments

Executive Summary

The Marlow Hazard Mitigation Plan Update 2013 serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Marlow Hazard Mitigation Committee and contains statements of policy adopted by the Board of Selectmen.

Hazards are addressed as follows:

Flooding	Severe Winter Weather	Subsidence	Lightning
Hurricanes	Earthquakes	Radon	Snow Avalanches
Wildfire	Dam Breach	Drought	Severe Wind
Tornados	Hazmat Spill	Extreme Heat	

The Committee identified critical facilities and potential hazard areas as follows:

Critical Facilities

- Fire Station
- Emergency Operations Center
- Police Station
- Town Hall
- Town Offices
- Emergency Fuel Facilities
- Emergency Generators
- Dry Hydrants/Fire Ponds
- Emergency Shelters
- Helicopter Landing Sites
- Primary Evacuation Routes
- Hospitals
- Communications Facilities
- Utilities

Potential Hazard Areas

- Flooding- Washington Pond Road
- Flooding- NH 10 S of Telephone Rd
- Flooding- Washington Pond Road west of Washington Townline
- Flooding- Hydroelectric Plant W of NH 10
- Flooding- NH 10 from Old Newport Rd to N of NH 123 S
- Flooding- Intersection of Gustin Pond Rd, Newell Pond Rd, and Honey Rd
- Erosion- NH 10 S of Stone Pond
- Erosion- All Class 6 roads in Town
- Erosion- Honey Road
- Erosion- NH 10 east of Marlow
- Erosion- Along the Ashuelot River Corridor
- Erosion- NH 123 North east of Beebe Rd
- Erosion- Reed Road
- Erosion- Jay Allen Road
- Dam Failure- Mill Dam near Mill Street
- Hazmat Spills- NH 10; NH 123 and all town roads
- Wildfires- Areas above 1,500 feet in elevation
- Wildfires- Areas in town where there was damage from 2008 ice storm

The Marlow Hazard Mitigation Committee identified **existing hazard mitigation programs** in various stages of development:

- School Evacuation Plan
- Building Codes
- Code Enforcement Officer
- Local Road and Driveway Design Standards
- Local Road Maintenance Program
- Mutual Aid
- Erosion and Sedimentation Plan
- Pager Warning System
- Smokey the Bear
- Health Officer
- Emergency Management Plan
- Safety awareness
- Ambulance Service
- Sand Pond Homeowners' Association
- Emergency Preparedness Pamphlets
- Master Plan
- Capital Improvements Program
- Business Continuity Plan
- Hazardous Material Response
- Phone Exchange System
- Citizen Corps
- Operating Budget
- Floodplain Development Ordinance
- Shoreland Water Quality Protection Act
- Bridge Monitoring
- Fire Burn Permit System
- Wetland Conservation District
- Fire Inspector

The Marlow Hazard Mitigation Committee identified previous mitigation actions that have been completed and incorporated into other Town plans:

- Incorporation of prevention and management plan of forest fires into the 2009 Water Resource Management Plan
-

Hazard Mitigation Strategies

The Marlow Hazard Mitigation Committee prioritized newly identified hazard mitigation strategies using the STAPLEE Method as shown in Chapter VII.

- Sign on to Fire Wise Program
- Encourage residents in flood zone to purchase NFIP insurance- distribute information
- Include hazard mitigation information on the Town website
- Improvements to Marlow Hill Road
- Update the Emergency Operations Plan (EOP)
- Install new Fire Danger sign
- Install dry hydrants
- Create a warning system on the Town website to notify residents of severe weather events or man-made dangers
- Install a generator in the Emergency Operations Center
- Investigate potential methods to implement a town-wide warning system
- Recruit additional volunteers for the Citizen Corp

Incorporation of Hazard Mitigation Plan into Other Planning Mechanisms

The Marlow Hazard Mitigation Committee identified a hazard mitigation action from the previous Plan that has been incorporated into other planning mechanisms:

- The Capital Improvement Plan includes an item to make necessary improvements to Marlow Hill Road to improve ditching and erosion control methods to help manage the flow of drainage, thereby preventing flooding and road washouts

(see also future involvement Chapter IX page 36)

CHAPTER I: INTRODUCTION

Background

As a result of the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) mandated that all communities establish local hazard mitigation plans as a means to reduce future losses from natural or man-made hazard events before they occur. In response to this mandate, the NH Bureau of Emergency Management (now the NH HSEM) contracted the Southwest Region Planning Commission (SWRPC) to develop a program that would achieve this goal. SWRPC prepared a hazard mitigation planning handbook to be used by local communities as a guide in the preparation of hazard mitigation plans. SWRPC then facilitated two hazard mitigation planning processes with selected communities as pilot projects. The resulting plans laid the foundation in an effort to enable all New Hampshire Regional Planning Commissions, through education outreach, the capability to assist their local communities, such as the Town of Marlow, in the preparation of local hazard mitigation plans.

What is Hazard Mitigation?

“Hazard Mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards” (44 CFR 206.401).

Authority

This Hazard Mitigation Plan Update 2013 was prepared under the authority of the planning requirements of Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390, which amended the Robert T. Stafford Act of 1988.

Funding Source

This Plan was funded by the NH Office of Homeland Security and Emergency Management, with grants from the Predisaster Mitigation Competitive Grant Program, as well as in-kind services by the Town of Marlow.

Purpose

The Marlow Hazard Mitigation Plan Update 2013 is a planning tool to be used by the Town of Marlow, as well as other local, state and federal governments, in their efforts to reduce the effects from natural and man-made hazards. This plan does not constitute any sections of Marlow’s Master Plan or Town Ordinances.

Scope of the Plan

The scope of this Plan includes the identification of past and potential natural and manmade hazards affecting the Town of Marlow, the determination of vulnerability of existing and future structures to the identified potential hazards, and the identification and discussion of new strategies aimed at mitigating the likely effects of potential hazards before they occur.

Methodology

Using the Guide to Hazard Mitigation Planning for New Hampshire Communities handbook, written by the Southwest Region Planning Commission, the Marlow Hazard Mitigation Committee developed the content of the Plan by following the ten step process set forth in the handbook and summarized below.

Step 1: Establish a Hazard Mitigation Planning Committee

The Hazard Mitigation Committee Chair contacted town officials and residents who might wish to volunteer their time and serve on a committee.

Step 2: Identification Critical Facilities

The Committee identified all of the critical facilities within the Town. These were identified using four categories: Category 1 - Emergency Response Facilities & Services; Category 2 - Non Emergency Response Facilities; Category 3 - Facilities/Populations to Protect; and Category 4 - Potential Resources. The list of Critical Facilities is found in Chapter V, "Critical Facilities."

Step 3: Identification of Past and Potential Hazards

The Committee members identified the following hazards that could or have affected the Town of Marlow and the locations of these past and/or potential events:

Flooding	Tornado	Hazardous Materials Spills
Drought	Hurricanes	Snow Avalanche
Extreme Heat	Earthquakes	Subsidence
Wildfire	Severe Wind/Downburst	Radon
Lightning Strikes	Extreme Winter Weather	Dams

The table in Chapter III contains information about all the past and potential hazards.

Step 4: Analyze Land Use and Development Trends

The Committee was asked to determine where future development would most likely take place in town. The information was compared to other documents such as Town Reports and the Town Master Plan. Chapter II, "Community Profile," shares this information.

Step 5: Risk Assessment

The Committee members completed a Risk Assessment for all of the types hazards identified in Step 3 in order to assess probability, severity and risk. Potential human impact, property impact and business impact for each hazard type were determined in addition to the likelihood of the hazard occurring within the next 25 years. Severity and risk were then calculated (**Appendix B** provides the methodology).

Step 6: Identifying What Mitigation Actions are Already in Place

The Committee identified plans and policies that are already in place to reduce the effects of hazards. The Committee evaluated the effectiveness of the existing measures to identify where they can be improved. The results are found in Chapter VI, "Existing Mitigation Strategies." The Committee also identified programs in place that would not be categorized as mitigation strategies.

Step 7: Identify the Gaps in Protection

For each general hazard type or specific potential hazard location identified in Step 3, the Committee identified possible mitigation actions not currently in place. Each was identified in one of the following

categories: Preventative (Programs & Policies); Property Protection; Structural; Emergency Services; and/or Public Education & Information.

Step 8: Prioritizing Proposed Mitigation Actions

The Committee ranked the proposed mitigation actions developed in Step 7 using the STAPLEE method which analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of each project.

Step 9: Develop an Implementation Plan

Using the prioritized list of mitigation actions identified in Step 8, the Committee developed a clear strategy that outlines who is responsible for implementing each project, as well as when and how the actions will be implemented.

Step 10: Adopt and Monitor the Plan

The Committee members reviewed and approved each section of the plan as it was completed. After acceptance by the Committee, the Plan was submitted to the New Hampshire Homeland Security and Emergency Management for initial review, and then forwarded to FEMA, for formal approval. Once approved, the Plan was formally adopted by the Board of Selectmen. It is important to the Town of Marlow that this plan be monitored and updated annually or after a Presidentially-declared disaster. Chapter X addresses this issue.

Plan Updates

During the planning process, the Committee reviewed relevant portions of the previous hazard mitigation plan and updated those portions accordingly. Unchanged sections were incorporated into the plan while other sections were amended to reflect changes. Particular attention was given to the previous mitigation strategies that have been completed and to give a status update on those that remain on the list. The 10 step process was followed during the meetings. The original plan was used as a base to begin the update. Amendments were made in each chapter to reflect changes that have occurred during the five year period. Included in the changes were:

- Ch. I Introduction- updated Methodology, Acknowledgements, etc., and added Plan Updates;
- Ch. II Community Profile - NFIP policies updated, added Continued Compliance with NFIP;
- Ch. III Hazard Identification & Assessing Vulnerability- estimated potential loss, updated hazards and their locations;
- Ch. IV Assessing Probability, Severity, and Risk - updated risk assessment;
- Ch. V Critical Facilities - updated locations and added new information;
- Ch. VI Existing Mitigation Strategies and Proposed Improvements - updated chart and other data, added chart for Status of Previous Mitigation Action Items;
- Ch. VII Proposed Mitigation Strategies - updated STAPLEE chart, set new priorities;
- Ch. VIII Prioritized Implementation Schedule - updated Action Plan with new actions;
- Ch. IX Adoption, Implementation, Monitoring and Updates - Adoption certificate, updated information;
- Appendices - agendas, resources, updated information.

This update was prepared with assistance from Planners at Southwest Region Planning Commission trained in Hazard Mitigation Planning. Data and maps used to prepare this plan are available at their office and should be used in preparing future updates.

FEMA Final Approval: (date)

Resources Used in Plan Preparation

In addition to the Handbook that was used as a framework for this plan, additional resources used included the Town Report, Marlow Assessment Data, Town Master Plan, NH Hazard Mitigation Plan (2010), NH DES Dam Classifications, 2010 US Census Data, the FEMA Community Information System website (to obtain data about the town's National Flood Insurance Program status), and a number of the resources identified in **Appendix C**.

Committee Meetings and Public Participation in the Planning Process

The Committee held a number of working meetings, open to the public including area business owners, schools, organizations and communities at Marlow Town Offices on the following dates: May 4, 2012, May 18, 2012, June 15, 2012, and September 7, 2012. On (*date of adoption*), the Marlow Board of Selectmen held a public hearing and adopted the Plan. All planning meetings and selectmen meetings were open to the public and the meeting agendas were posted at the Town Offices and the Post Office. Appendix E provides copies of agendas and the public notice of the draft plan for the public viewing period.

Public Participation:

A mailing was made to each committee member, prior to each meeting that contained information from the previous meeting, an agenda sheet, and information to be covered. A copy of the Agenda for each meeting was posted at the Town Office for public viewing prior to each meeting to encourage public participation.

In addition, an article was printed in the Southwest Region Planning Commission Newsletter prior to the first meeting to inform the members of the community as well as surrounding communities and other interested stakeholders in participating in this plan update. Copies of the newsletter are sent to the 35 towns within the region, the Cheshire County Office, businesses, and other interested parties. It is also available on the Southwest Region Planning Commission Website.

A copy of the draft plan was made available for public review and input at the Town Office from November 6 – 16, 2012. Notification of the draft available for public viewing was included on the Town website to reach a broad range of interested parties. A copy of the public notice is in Appendix E. There were no comments from the public received following the public viewing period.

Acknowledgements

The Marlow Board of Selectmen extends special thanks to the Marlow Hazard Mitigation Committee:

Dave Smith – Marlow Emergency Management Director
Tony Davis – Marlow Road Agent
Ken Avery – Marlow Police Chief
Thomas Foote – Marlow Fire Chief

Ed Thomas – Marlow Selectman
Bob Allen - Marlow Selectman
Thomas Fuschetto – Marlow Selectman
Jacqui Fay – Marlow Ex. Administrator

The Marlow Board of Selectmen offers thanks to the New Hampshire Office of Homeland Security and Emergency Management for developing the State of New Hampshire Natural Hazards Mitigation Plan (2010) which served as a model for this plan. In addition, special thanks are extended to the staff of the Southwest Region Planning Commission for professional services, process facilitation and preparation of this document.

HAZARD MITIGATION GOALS

The Marlow Hazard Mitigation Committee reviewed the Goals set forth in the New Hampshire Hazard Mitigation Plan – 2010. The committee concurs with those goals and has adopted them as part of this plan. The following goal statements are aimed at reducing or avoiding long-term vulnerabilities to identified hazard areas.

Town of Marlow, NH

The overall Goals of the Town of Marlow with respect to Hazard Mitigation are stipulated here:

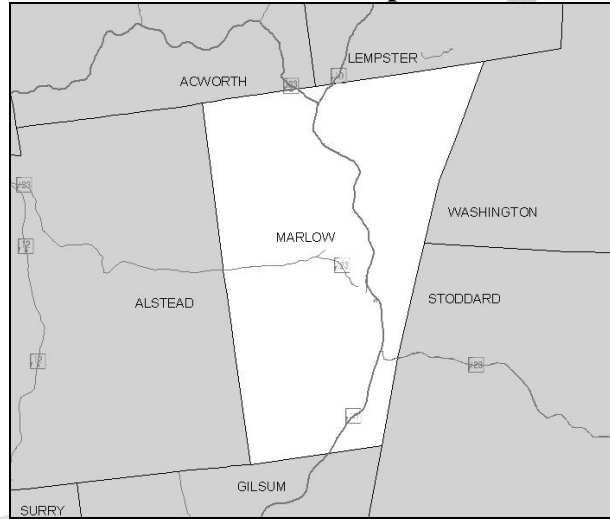
1. To improve upon the protection of the general population, the citizens of the Town of Marlow and guests, from all natural and man-made hazards.
2. To reduce the potential impact of natural and man-made disasters on the Town of Marlow's Emergency Response Services, Critical Facilities, and infrastructure.
3. To reduce the potential impact of natural and man-made disasters on the Town of Marlow's economy, natural resources, historic/cultural treasures, and private property.
4. To improve the Town of Marlow's Emergency Preparedness and Disaster Response and Recovery Capability.
5. To reduce the Town of Marlow's liability with respect to natural and man-made hazards through a community education program.
6. To identify, introduce and implement cost-effective Hazard Mitigation measures to accomplish the Town's Goals and Objectives and to raise the awareness of and acceptance of Hazard Mitigation opportunities generally.
7. To address the challenges posed by climate change as they pertain to increasing risks in Marlow's infrastructure and natural environment.
8. To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals.

CHAPTER II: COMMUNITY PROFILE

Town Overview¹

The Town of Marlow is located in northern Cheshire County, in Southwest New Hampshire. Marlow is bounded on the north side by Acworth and Lempster, easterly by Washington and Stoddard, southerly by Gilsum and westerly by Alstead. The population of Marlow is 742 according to the 2010 US Census.

Location Map



Marlow has a total area of 16,960 acres, of which 1,635 acres are committed to existing development of roads and buildings. This means that only 9.7% of Marlow's total area is developed while 90.3% of the remaining land and water are potential available for development.

The general elevation of the territory is about 1,500 feet above sea level. The highest point at, 2,100 feet, is Huntley Mountain, and the lowest at, 975 feet, is in the southeast corner. The Ashuelot River flows through nearly its entire eastern length, entering from Washington, at an elevation of about 1,300 feet, and passing into Gilsum at 975 feet above sea level. Grassy Brook occupies a very similar relation to the western portion of the town, though its fall is much more gradual. Among the ponds, Stone, Sand, Gustin and Big Ponds are the larger. The latter is an enlargement of Ashuelot River. The water from all these ponds reaches the Connecticut River through the channel of the Ashuelot.

Disaster Risk

Extreme winter weather, riverine flooding, and dam failure carry the greatest risks for Marlow, followed by wildfire, lightning, hazardous materials spills and erosion. The high risk is attributed to both the high probability of these events occurring and the extent of possible damage associated with them. More information about risk can be found in Chapter IV.

¹ Data taken from Marlow Master Plan Update

Existing Land Use

The following land use descriptions are from the Marlow Master Plan and the 2010 Natural Resource Inventory: Marlow has a total area of 16,960 acres, of which 1,635 acres are committed to existing development of roads and buildings. This means that only 9.7% of Marlow’s total area is developed while 90.3% of the remaining land and water are potential available for development. Of course, not all of this land and water area can support development because of a variety of factors including accessibility, soil conditions, water and wetlands, and topographic constraints to development. The topography ranges from approximately 1,500 feet at the Ashuelot River along the southern town boundary to nearly 2,000 feet atop Huntley Mountain. The most densely populated center is in the Village at the intersection of NH Routes 10 and 123 along the Ashuelot River.

Existing Land Use in Marlow

Land Use	Acres	% of Developed Land	% of Town
Residential	337	20.6%	2%
Commercial	9	.5%	.1%
Industrial	7	.4%	0%
Governmental	37	2.3%	.2%
Institutional	9	.6%	.1%
Recreational	733	44.8%	4.3%
Agricultural	211	12.9%	1.3%
Road Network	292	17.9%	1.7%
Total Developed Land	1,635	100%	9.7%
Remaining Land & Water	15,287		90.3%
Total Land and Water	16,922		100%

Source: Marlow Master Plan

Development Trends²

There have been two notable trends in Marlow. First, land is being withdrawn from agricultural use and being directed or allowed to return to forest or idle use. Second, there has been an increase of developed land, as required to absorb population growth. Based on population estimates, Marlow can expect the arrival of almost 50 new households during the next 20 years.

The most cost-effective and efficient locations for residential growth are in close proximity to the town’s service center and along existing highly accessible and well-maintained roads. The constraints of wetlands and probable land availability, however, limit expansion potential in the immediate town center and south along Route 10. As a result, residential expansion is projected for the general area of Marlow Hill; along NH 123 from Gustin Pond Road to Alstead; along Gustin Pond Road to Newell Pond Rd; along Sand Pond Road; and along West Shore Road. The remainder of town will be designated for large lot development in order to direct the bulk of the future residential development into those areas most beneficial to the town in terms of its location. This pattern, of course, recognizes the desire to manage subdivision development, and accepts the fact that continued individual home development would occur throughout town in accordance with the requirements and limitations of state and town regulations.

² Text from Marlow Master Plan

Commercial land use in town has been planned to increase in stride with the growth of the town's population, since the bulk of commercial activity is envisioned as servicing the townspeople and being located within, or in close proximity to the present village center.

Commercial uses, as they occur, are expected to fill in vacant spaces as they presently exist, or may occur, in the village center, along with the full range of uses that are presently found at that location. This development pattern will continue a historical trend of growth in the community and will maintain commercial activity in the logical location that is the focal point of the town, generally that area where NH 123 intersects NH 10. Since the townspeople are most interested in maintaining the present rural character of the community, it is not anticipated that a climate to attract major commercial development will be provided by the town. Because a very good state highway network services Marlow, it is felt that opportunity exists for limited commercial development geared to the traveling public. For this reason, land directly abutting a state highway will be considered for commercial use under strict control and on a project-by-project basis.

Although industrial development in Marlow is very modest at the present time, accommodation for expansion of the industrial base should be given. Again, due to favorable highway access, consideration will be given to requests for light industrial activities, provided that they have frontage on a state highway, that they are completely compatible with adjacent properties, and that they do not detract from the essential rural character of the town. There is no indication of the need for expansion in other land use categories. The continuance of the traditional "home occupations" will undoubtedly accommodate much of the requirement for small, locally oriented businesses and service activities.

Development in Hazard Areas

Some hazards identified in this plan are regional risks and, as such, all new development falls into the hazard areas. These include severe winter weather, tornados, hurricanes, lightning, wildfires, and earthquake. There are many areas in town that are prone to flooding as well. The town should monitor proposed development located in identified potential hazard areas.

National Flood Insurance Program (NFIP)

The National Flood Insurance Program (NFIP) permits homeowners who live in the floodplain and the rest of the community to purchase flood insurance for their property. Marlow entered into the NFIP via emergency entry on November 3, 1975 and became a regular member April 2, 1986. Flood Insurance Rate Maps for Marlow became effective April 2, 1986, and since that time the town has regularly participated in the NFIP. In order for landowners to be able to purchase this insurance, the town needed to adopt a Floodplain Management Ordinance, which it has done. This Ordinance requires the town to keep track of all development in the Special Flood Hazard Areas (SFHA) and ensure that if any new construction or substantial improvements to a home are proposed for the SFHA, the lowest enclosed floor must be at or above the base flood elevation.

The purposes of this requirement are to minimize the potential for flood damage, to avoid damage-prone uses in the floodplains, and to reduce development pressure of flood hazard areas. Communities that do not maintain and/or enforce their floodplain regulations may be suspended from the insurance program, which could have serious consequences for any affected landowners if their mortgage holders wished to cancel the mortgage. For these reasons, it is very important for the town to keep the floodplain management ordinance up to date by amending it as necessary, and to monitor all development within these areas.

As of July 5, 2010, there were 10 flood insurance policies totaling \$1,909,400 in insurance. This Biennial report also notes that there have been 4 paid losses totaling \$128,514.27. As of the 2010 Biennial, there are 20 residents living within a special flood hazard area. There are 69 1-4 family houses in the special flood hazard area. Flood Insurance Rate Maps, all bearing the effective date of 5/23/2006, are used for flood insurance purposes and are on file with the Marlow Planning Board. There are currently no “Repetitive Loss Properties” within the Town of Marlow.

Continued Compliance with NFIP Requirements

The Town of Marlow acknowledges the importance of maintaining requirements set forth in the National Flood Insurance Program. As such, the town took several steps related to continued compliance with the program that will help to reduce or eliminate the potential for loss of life and property due to flooding.

The following actions have been taken since the last Hazard Mitigation Plan:

- Sought additional volunteers to help in fire safety/education and for emergency response;
- Sent informational pamphlet to residents to reduce the effects of potential hazards on life & property;
- Notified residents of emergency shelter location & things to bring with them;
- Explored options to improve emergency warning system;
- Identified and secured the use of suitable emergency shelter;
- Designated the fire station as the alternative location for the Emergency Operations Center;
- Purchased additional high water/flooding signs and barricades to communicate road closures;
- Put stone in ditches to slow rate of water flow;
- Built beaver pipes to control water levels in dam locations.

While this update continues with structural projects, public outreach and education are also seen as a key to providing information to residents by raising an awareness of measures that they can take. Many of these items will be on-going actions to maintain awareness and continued monitoring.

CHAPTER III: HAZARD IDENTIFICATION AND ESTIMATING LOSSES

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Marlow. These hazards were identified from the State of New Hampshire Hazard Mitigation Plan (2010), the Federal Emergency Management Administration website, and in a brainstorming session with the Hazard Mitigation Planning Committee.

List of Hazards

Flooding- Disaster Declarations
Flooding- Localized areas
Drought
Extreme Heat
Wildfires
Lightning
Tornadoes
Hurricanes
Earthquakes
Severe Wind/Downbursts
Extreme Winter Weather
Hazardous Materials Incidents
Snow Avalanche
Erosion
Subsidence
Radon
Dams

Estimating Potential Losses

Existing and future structures have the potential of being affected by some of the hazards identified in this Plan. The table below indicates the number and types of structures would be affected by future hazards. Some hazards identified in this plan are regional or town wide risks and, as such, all structures, infrastructure and critical facilities fall into the hazard area.

In order to determine estimated potential losses due to future natural and man made hazards, structures need to be assigned a value. The valuation of all structures was \$35,687,560 according to the Marlow Annual Report 2011 and the median house value was \$173,697.

Potential losses were calculated for each hazard area by multiplying the type and number of potentially at risk structures by the appropriate calculated average valuation.

Hazard	Date	Location	Comments
<p>Below is a listing of Disaster Declarations for flooding events within the State of New Hampshire. Several severe events have caused significant damage to structures and roadways within the southwest region.</p>			
FLOODING- DISASTER DECLARATIONS			
Flood	1927	Southern NH	Damage to Road Network. Caused many roads to wash out.
Flood	March 11-21, 1936	NH State	Damage to Road Network. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather. Run-off from melting snow with rain overflowed the rivers
Flood/ Severe Storm	August 27, 1986	Cheshire, Hillsborough Counties, NH	FEMA Disaster # 771-DR (Presidentially Declared Disaster) \$1,005,000 in damage
Flood / Severe Storm	April 16, 1987	Cheshire, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, & Sullivan Counties, NH	FEMA Disaster Declaration # 789- DR (Presidentially Declared Disaster). Flooding of low-lying areas along river caused by snowmelt and intense rain. \$4,888,889 in damage.
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	FEMA Disaster Declaration # 876. Flooding caused by a series of storm events with moderate to heavy rains. \$2,297,777 in damage.
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties, NH	FEMA Disaster Declaration # 1144- DR. Flooding caused by heavy rains. \$2,341,273 in damage.
Flood	July 2, 1998	Southern NH	FEMA Disaster Declaration # 1231. Severe storms and flooding
Heavy Rain/ Flood	September 18-19, 1999	Belknap, Cheshire, Grafton Counties, NH	FEMA Disaster Declaration # DR-1305-NH. Heavy rains associated with Tropical Storm/Hurricane Floyd.
Severe Storm/ Flood	September 12, 2003	Cheshire and Sullivan Counties, NH	FEMA Disaster Declaration # 1489-DR. Damage amount \$1,300,000.
Flood	October 26th 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding.
Flood	April 16, 2007	All counties, NH	FEMA Disaster Declaration # 1695. Severe storms and flooding. Marlow had multiple areas of flooding.
Flood	May 26-30, 2011	Coos and Grafton County	FEMA Disaster Declaration #DR-4006 May flooding event.
Flood	May 29-31, 2012	Cheshire County	FEMA Disaster Declaration # DR-4065. Severe storm and flood event.
FLOODING- LOCALIZED- LOW –MED RISK (RIVERINE FLOODING- MED-HIGH RISK)			
<p>The Town of Marlow has approximately 69 structures within the flood hazard area. The vast majority of these structures are single-family homes with basements. Assuming a major flood occurred with at depth of four feet, the estimated damage could be 11,985,093.</p>			
Flooding	Past and Potential	Intersection of Gustin Pond Rd, Newell Pond Rd, and Honey Rd	Flooding of road due to Grassy Brook high water during heavy rains. Cause is the beaver pond. No structures at risk.

Hazard	Date	Location	Comments
FLOODING- LOCALIZED- LOW-MED RISK (RIVERINE FLOODING- MED-HIGH RISK-CON'T			
Flooding	Past and Potential	North of Sand Pond Rd/NH 10 intersection	Flooding at this location during high waters has damaged one home in the past and has the potential of damaging that one home in future events. This last occurred in 2005. Beaver dams increase the surge of water during heavy rains. (potential damage \$173,697)
Flooding	Past and Potential	Hydroelectric Plant west of NH 10	The hydroelectric plant has flooded during times of extremely high water. Last occurred in 2005. Does not happen regularly. (potential damage \$38,370)
Flooding	Past and Potential	NH 10 South of Telephone Road	Flooding at this location due to proximity to the Ashuelot River. One home is at risk at this location. This last occurred in 2005. (potential damage \$173,697)
Flooding	Past and Potential	NH 10 from Old Newport Road to North of NH 123 South	This area has flooded several times in past years in times of high water due to its proximity to the Ashuelot River. Past and potential structures at risk include the Fire Department building, 1 commercial structure and 8 homes. This last occurred in 2005. (potential damage \$1,501,426)
Flooding	Past and Potential	Washington Pond Road west of Washington Townline	Flooding at this location due to proximity to the Ashuelot River. This last occurred in 2005.
Flooding	Past and Potential	Washington Pond Road	Flooding at this location due to proximity to the Ashuelot River. Two homes are at risk at this location. One home was damaged in 2005. (potential damage \$347,394)
Flooding	Past and Potential	Washington Pond Road north of Symondsville Rd	Flooding at this location due to proximity to the Ashuelot River. This last happened in 2005.
Flooding	Potential	Sand Pond Area and Ashuelot Pond Area	Homes could be isolated in the case of severe flooding.
Flooding	Potential	Anywhere along the Ashuelot River	The Ashuelot River poses a risk in town in times of high water.
Flooding	Potential	Anywhere within the identified flood hazard areas	Throughout Town. There are 69 structures in the flood hazard areas. (potential damage \$11,985,093)
EROSION- LOW-MED RISK			
Marlow has experienced erosion in several of the areas of town with steep slopes. It can occur after heavy rains and flash floods. Heavy rain events in early spring have caused areas to erode resulting in road damage and access problems.			
Erosion	Past and Potential	Along the Ashuelot River Corridor	Strong rain events in past years have resulted in much erosion along the Ashuelot River.
Erosion	Past and Potential	Jay Allen Road	Erosion due to flash floods, spring melt and topography.

Hazard	Date	Location	Comments
Erosion	Past and Potential	Honey Road	Erosion due to flash floods, spring melt and topography.
Erosion	Past and Potential	Stone Pond Rd	Erosion due to flash floods, spring melt and topography.
Erosion	Past and Potential	NH 10 South of Stone Pond	Erosion due to flash floods, spring melt and topography. Also, proximity to Gee Brook.
Erosion	Past and Potential	NH 10 South of Sand Pond Rd/NH 10 intersection	Erosion due to flash floods, spring melt and topography. Also, proximity to Gee Brook. One home is at risk here. (potential damage \$173,697)
Erosion	Past and Potential	NH 10 east of Marlow Hill	Erosion due to flash floods, spring melt and topography.
Erosion	Past and Potential	NH 123 North east of Beebe Rd	Erosion due to proximity to Grassy Brook.
Erosion	Past and Potential	Reed Road	Erosion due to flash floods, spring melt and topography.
Erosion	Past and Potential	All Class 6 roads in Town	All class 6 roads are prone to erosion.
DROUGHT- LOW RISK			
Marlow has not had experience with severe drought conditions. Drought will increase the risk of wildfire, especially in areas of high recreational use. Drought may cause wells to run dry, and will reduce the amount of water available for fire fighting.			
Drought	1929-1936	Statewide	Regional. Recurrence Interval 10 to > 25 years
Drought	1939-1944	Statewide	Severe in southeast and moderate elsewhere. Recurrence Interval 10 to > 25 years
Drought	1947-1950	Statewide	Moderate. Recurrence Interval 10 to > 25 years
Drought	1960-1969	Statewide	Regional longest recorded continuous spell of less than normal precipitation. Encompassed most of the Northeastern US. Recurrence Interval > 25 years
Drought	2001-2002	Statewide	Fourth worst drought on record, exceeded only by the droughts of 1956-1966 and 1941-1942.
Drought	2012	Statewide	Considered to be drier than the drought of 1941
EXTREME HEAT- LOW RISK			
Extreme heat can be dangerous to those residents with medical conditions and the elderly. It is important to have cooling areas and a good supply of water available. Extreme heat can add to the potential for wildfires and depletes the water supply for firefighting. Outreach and education on methods of dealing with extreme heat are important.			
Extreme Heat	July, 1911	New England	11-day heat wave in New Hampshire
Extreme Heat	Late June to September, 1936	North America	Temps to mid 90s in the northeast
Extreme Heat	Late July, 1999	Northeast	13+ days of 90+ degree heat

Hazard	Date	Location	Comments
Extreme Heat	Early August, 2001	New Hampshire	Mid 90s and high humidity
Extreme Heat	August 2-4, 2006	New Hampshire	Regional heat wave and severe storms.
WILDFIRES- LOW-MEDIUM RISK			
<p>As timber harvesting is reduced, wood roads close and debris builds up on the ground, the potential for wildfire increases town-wide. Severe ice storm events in 1998 and 2008 created significant quantities of slash, thus increasing the potential for a wildfire. Other weather events such as hurricanes and downbursts add to the amount of downed timber and increase the potential for wildfires. Forested areas with high fuel content have more potential to burn. Outreach and education is an important method of reducing the potential for disasters such as wildfires. Marlow experienced a serious wildfire in 1941. Details of the extent of damage can be found in Appendix F.</p>			
Wildfire	1941	Fire of 1941.	This fire started in Marlow and spread to Stoddard, Washington and Gilsum. Appendix F shows the extent.
Wildfire	Potential	Areas in town where there was damage from the 1998 ice storm.	The ice storm of 1998 caused large blocks of downed timber creating fuel for future fires.
Wildfire	Potential	Sand Pond and Ashuelot Pond Areas	Homes could be isolated in the case of wildfire.
Wildfire	Potential	Areas above 1,500 feet in elevation	These areas due to their elevation are at higher risk for wildfires and are most likely the areas impacted most by the ice storm of 1998.
LIGHTNING- LOW-MED RISK			
<p>Lightning is an unpredictable hazard. It could strike anywhere in Marlow and potentially start a forest fire especially in periods of drought. High elevations and areas around waterbodies may be more susceptible to lightning strike incidents. The following have a greater potential of risk of a lightning strike: utility poles, antennas and cell towers, boaters, and hikers.</p>			
Lightning	Past and Potential	Marlow Hill Area	This area is prone to lightning strikes due to its elevation.
Lightning	Past and Potential	Jay Allen Road Area	This area is prone to lightning strikes due to its elevation.
Lightning	Potential	Town wide	There is town wide risk for lightning strikes.
Lightning	Past and Potential	Fire Station	The Fire Station has been struck by lightning several times. (potential damage \$67,850)
Lightning	Past Occurrence	Jones Hole (near Fire Station)	There have been multiple strikes in this area between 2007-2012. Two of those strikes caused damage to the chimney and alarm system.

TORNADOS (FUJITA SCALE GIVEN IF KNOWN)- LOW RISK			
Tornadoes rarely occur in this part of the country; therefore assessing damages is difficult. Buildings have not been built to Zone 2, Design Wind Speed Codes. Estimated damage to 10% of structures with 20% damages is \$1,493,794. Estimated cost does not include building contents, land values, or utilities.			
Tornado	September 15, 1922	Cheshire County	F2
Tornado	September 13, 1928	Cheshire County	F2
Hazard	Date	Location	Comments
Tornado	August 13, 1963	Cheshire County	F2
Tornado	June 6, 1963	Cheshire County	F2
Tornado	July 2, 1997	Cheshire County	F1
Tornado	Approx 1997	Mansfield Rd area, Marlow	This tornado carved out a path approximately 100 feet wide. No structures were damaged.
HURRICANES (CATEGORY GIVEN IF KNOWN) AND TROPICAL STORMS- LOW-MEDIUM RISK			
Marlow's inland location in southwestern New Hampshire reduces the risk of extremely high winds that are associated with hurricanes. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. Hurricanes can and do create flooding. Safety concerns of well water contamination due to heavy rains. Possible flooding of evacuation routes. Estimated wind damage to 5% of the structures with 10% damage is \$375,185. Estimated flood damage to 10% of the structures with 20% damage is \$1,493,794. Cost of replacing contents of buildings is not included in this estimate.			
Hurricane	August, 1635	n/a	
Hurricane	October 18-19, 1778	n/a	Winds 40-75 mph
Hurricane	October 9, 1804	n/a	
Gale	September 23, 1815	n/a	Winds > 50mph
Hurricane	September 8, 1869	n/a	
Hurricane	September 21, 1938	Southern New England	Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total storm losses of \$12,337,643 (1938 dollars). 186 mph maximum winds.
Hurricane (Carol)	August 31, 1954	Southern New England	Category 3, winds 111-130 mph. Tree & crop damage in NH, localized flooding.
Hurricane (Edna)	September 11, 1954	Southern New England	Category 3 in Massachusetts. This Hurricane moved off shore but still cost 21 lives and \$40.5 million in damages throughout New England. Heavy rain in NH.
Hurricane (Donna)	September 12, 1960	Southern and Central NH	Category 3 (Category 1 in NH). Heavy flooding in some parts of the State.
Tropical Storm (Daisy)	October 7, 1962	Coastal NH	Heavy swell and flooding along the coast

Hazard	Date	Location	Comments
Tropical Storm (Doria)	August 28, 1971	New Hampshire	Center passed over NH resulting in heavy rain and damaging winds
Hurricane (Belle)	August 10, 1976	Southern New England	Primarily rain with resulting flooding in New Hampshire. Category 1
Hurricane (Gloria)	September, 1985	Southern New England	Category 2, winds 96-110 mph. Electric structures damaged; tree damages. This Hurricane fell apart upon striking Long Island with heavy rains.
Hurricane (Bob)	August 19, 1991	Southern New England	Structural and electrical damage in region from fallen trees. 3 persons were killed and \$2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR
Hurricane (Edouard)	September 1, 1996	Southern New England	Winds in NH up to 38 mph and 1 inch of rain along the coast. Roads and electrical lines damaged
Tropical Storm (Floyd)	September 16-18, 1999	Southern New England	FEMA DR-1305-NH. Heavy Rains
Tropical Storm (Tammy)	October 5-13, 2005	East Coast of US	Remnants of Tammy contributed to the October 2005 floods which dropped 20 inches of rain in some places in NH.
Tropical Storm Irene	August 26-September 6, 2011	Western portion of New Hampshire	FEMA Disaster Declaration #EM-3333; DR-4026. Dropped more than 6 inches of rain in a short period causing road collapses, severe erosion, and flooding in the southwest region of New Hampshire
Tropical Storm Sandy	October 26-November 8, 2012	Eastern United States	FEMA Disaster Declaration # DR-4095; Considered the costliest hurricane/tropical storm in US history with costs exceeding \$70 billion. 253 deaths, millions of power outages.
EARTHQUAKES (MAGNITUDE GIVEN IF KNOWN)- LOW RISK			
<p>There have been minor earthquakes felt in town, however, there have been no recorded structural damage in Marlow caused by earthquakes. Structures are mostly of wood frame construction. Estimated damage to 20% of town assessed structural valuation is \$7,137,512. Estimated cost does not include building contents, land values, or utilities. Below is a listing of occurrences and the rating if known.</p>			
Earthquake	1638	Central New Hampshire	6.5-7
Earthquake	October 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	December 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	November 18, 1755	Cape Ann, MA	6.0, much damage
Earthquake	1800s	Statewide New Hampshire	83 felt earthquakes in New Hampshire
Earthquake	1900s	Statewide New Hampshire	200 felt earthquakes in New Hampshire

Hazard	Date	Location	Comments
Earthquake	March 18, 1926	Manchester, NH	Felt in Hillsborough County
Earthquake	December 20, 1940	Ossipee, NH	Both earthquakes of magnitude 5.5, structural damage to homes.
Earthquake	December 24, 1940	Ossipee, NH	
Earthquake	December 28, 1947	Dover-Foxcroft, ME	4.5
Earthquake	June 10, 1951	Kingston, RI	4.6
Earthquake	April 26, 1957	Portland, ME	4.7
Earthquake	April 10, 1962	Middlebury, VT	4.2
Earthquake	June 15, 1973	Near NH Quebec Border, NH	4.8
Earthquake	January 19, 1982	Gaza (west of Laconia), NH	4.5, walls and chimneys cracked, damage up to 15 miles away in Concord
Earthquake	October 20, 1988	Near Berlin, NH	4
Earthquake	January 3, 2011	Northwest of Laconia	2.5
Earthquake	August 23, 2011	Travelled up the east coast from Virginia to New Hampshire	5.8
Earthquake	October 16, 2012	Felt throughout most of the New England states; centered in Maine	4.0
SEVERE WIND- LOW-MEDIUM RISK			
<p>Town at risk from severe localized blasting winds. Structural damage potential; such events cause small blocks of downed timber. High elevations at greatest risk. Old trees along roads at risk of falling and causing damage to structures during wind events. Potential for loss of electricity. Information on specific events that have occurred in Marlow are listed in the Hurricanes and Tropical Storms category.</p>			
EXTREME WINTER WEATHER- MEDIUM RISK			
<p>Three types of winter events are heavy snow, ice storms and extreme cold. Occasionally heavy snow will collapse buildings. Ice storms have disrupted power and communication services. Extreme cold affects the elderly. These random events make it difficult to set a cost to repair or replace any of the structures or utilities affected. Several extreme weather events have occurred that have left the Town without power and have caused damage to structures. These events are listed below.</p>			
Ice Storm	December 17-20, 1929	New Hampshire	Unprecedented disruption and damage to telephone, telegraph and power system. Comparable to 1998 Ice Storm (see below)
Blizzard	February 14-17, 1958	New Hampshire	20-30 inches of snow in parts of New Hampshire
Snow Storm	March 18-21, 1958	New Hampshire	Up to 22 inches of snow in south central NH
Snow Storm	December 10-13, 1960	New Hampshire	Up to 17 inches of snow in southern NH
Snow Storm	January 18-20, 1961	New Hampshire	Up to 25 inches of snow in southern NH

Hazard	Date	Location	Comments
Snow Storm	February 2-5, 1961	New Hampshire	Up to 18 inches of snow in southern NH
Snow Storm	January 11-16, 1964	New Hampshire	Up to 12 inches of snow in southern NH
Blizzard	January 29-31, 1966	New Hampshire	Third and most severe storm of 3 that occurred over a 10-day period. Up to 10 inches of snow across central NH
Snow Storm	December 26-28, 1969	New Hampshire	Up to 41 inches of snow in west central NH
Snow Storm	February 18-20, 1972	New Hampshire	Up to 19 inches of snow in southern NH
Snow Storm	January 19-21, 1978	New Hampshire	Up to 16 inches of snow in southern NH
Blizzard	February 5-7, 1978	New Hampshire	New England-wide. Up to 25 inches of snow in central NH
Snow Storm	February, 1979	New Hampshire	President's Day storm
Ice Storm	January 8-25, 1979	New Hampshire	Major disruptions to power and transportation
Snow Storm	April 5-7, 1982	New Hampshire	Up to 18 inches of snow in southern NH
Ice Storm	February 14, 1986	New Hampshire	Fiercest ice storm in 30 yrs in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to New London NH
Extreme Cold	November-December, 1988	New Hampshire	Temperature was below 0 degrees F for a month
Ice Storm	March 3-6, 1991	New Hampshire	Numerous outages from ice-laden power lines in southern NH
Snow Storm	1997	New Hampshire	Power outages throughout Marlow due to heavy snowfall
Ice Storm	January 15, 1998	New Hampshire	Federal disaster declaration DR-1199-NH, 20 major road closures, 67,586 without electricity, 2,310 without phone service, \$17+ million in damages to Public Service of NH alone
Snow Storm	February 2006	New Hampshire	Trees down and power outages.
Extreme Winter Weather	Potential	Sand Pond Area	Approximately 70 homes could become isolated in the case of severe winter weather. There is only one road to access this area.
Extreme Winter Weather	Potential	Ashuelot Pond Area (in the town of Washington)	Approximately 35 homes could become isolated in the case of severe winter weather. There is only one road to access this area and this road access is from the town of Marlow.

Hazard	Date	Location	Comments		
Ice Storm	December 2008	Southwest Region New Hampshire	Downed trees and power lines. Residents without power for 7-10 days.		
Snow Storm	October 29-30, 2011	New Hampshire	FEMA Disaster Declaration # DR-4049 (Hillsborough and Rockingham Counties). Severe snowstorm event. Snowfall 34" in a 24 hour period.		
HAZARDOUS MATERIAL SPILLS- LOW RISK					
HAZMAT	Potential	NH 10 and NH 123 and all town roads	All roads in town are at some risk of hazardous materials spills.		
HAZMAT	Potential	Intersection of NH 10 and 123	Tanker trucks make deliveries to the gas station 1-2 times per week. Previous dangerous turn-around situation has been corrected		
SNOW AVALANCHE- LOW RISK					
The Town has no history of snow avalanche events.					
SUBSIDENCE- LOW RISK					
There are no areas that have been or would be affected by subsidence in Marlow.					
RADON- LOW RISK					
<p>In Marlow, there are no known records of illness that can be attributed to radon. However, Marlow residents should be aware that radon is present. Houses with granite and dirt cellars are at increased risk. The State of NH Hazard Mitigation Plan (October 2010 ed.) identifies communities in Hillsborough County as having a moderate risk for exposure to radon.</p>					
Summary Table of Short-term Indoor Radon Test Results in NH's Radon Database (11/14/03)					
County	# Tests	G. Mean	Maximum	% > 4.0 pCi/l	% > 12.0 pCi/l
Belknap	744	1.3	22.3	14.4	1.3
Carroll	1042	3.5	478.9	45.4	18
Cheshire	964	1.3	131.2	15.6	2.3
Coos	1072	3.2	261.5	41	17
Grafton	1286	2.0	174.3	23.2	5.2
Hillsborough	2741	2.1	202.3	29.6	6.8
Merrimack	1961	2.0	152.8	25.2	6
Rockingham	3909	3.0	155.3	40	9.5
Strafford	1645	3.4	122.8	44	13
Sullivan	466	1.4	29.4	15.7	2.1
STATEWIDE	15860	2.4	478.9	32.4	8.6

DAMS- MEDIUM RISK			
Hazard	Date	Location	Comments
Dam Risk	Potential	Mill Dam near Mill Street	If this dam were to fail, the southern part of town would be at risk.
Dam Risk	Potential	Ashuelot Pond Dam (in the Town of Washington)	If this dam were to fail, many homes would be threatened. The school, which serves as a shelter, would also be threatened. This dam breached in 2005.
Beaver Dam Risk	Potential	Various locations in town	There is a risk if any of the many beaver dams fail during heavy storms.

The State of New Hampshire classifies dams into the following four categories:
 NM – Non-menace S – Significant hazard Blank- Non-Active
 L – Low hazard H – High Hazard

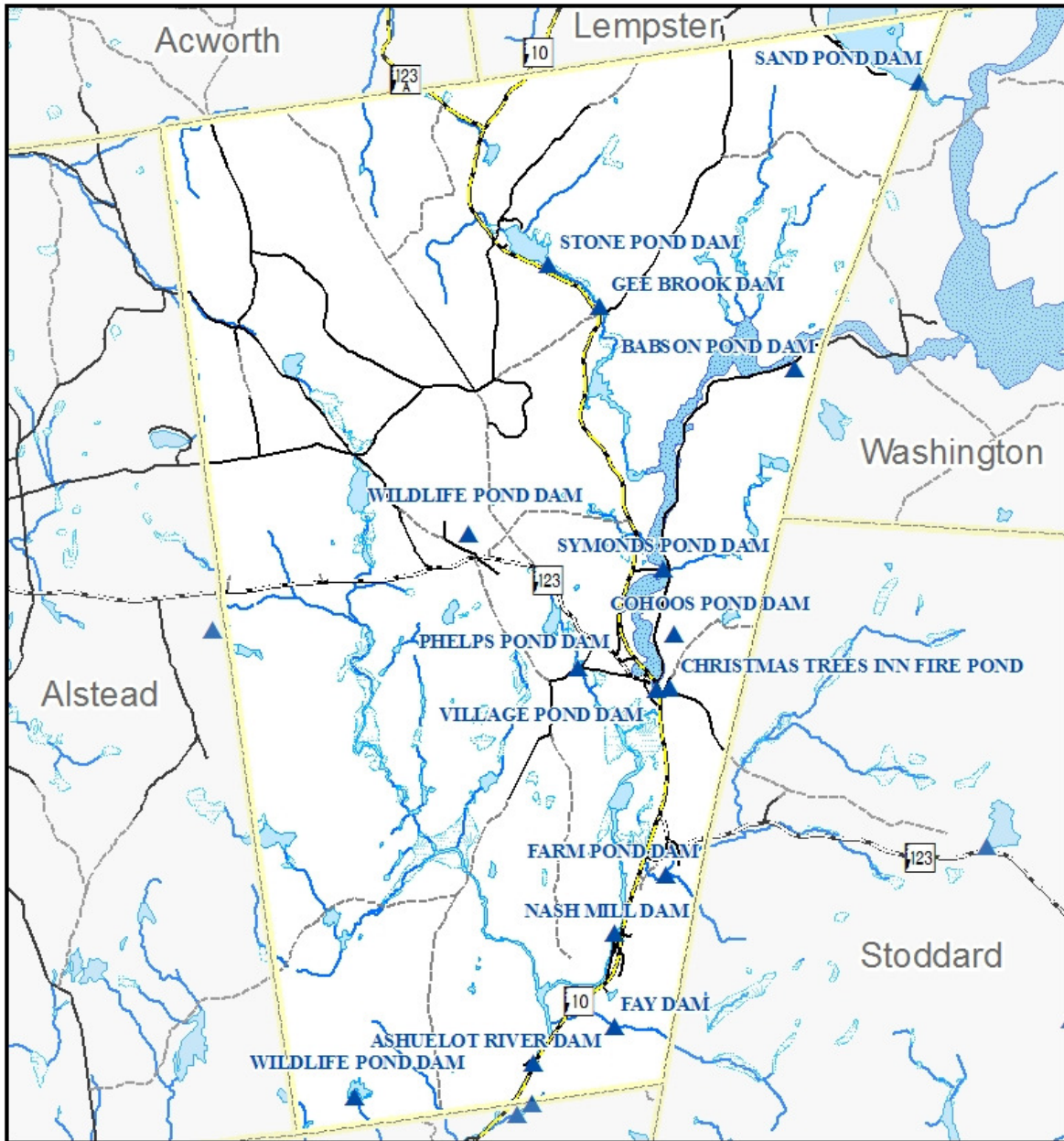
The table below shows all dams in the Town of Marlow.

Dam #	Class	Owner	River	Dam Name	Status	Type	Impd Acres	Height (ft)
152.01	NM	David Kinson	Gee Brook	Stone Pond Dam	Active	Earth/Stone	26.5	5.25
152.02		Maurice Ronayere	Gee Brook	Gee Brook Dam	Breached	Earth/Stone	0	14
152.03		Martha Ames	Ashuelot River	Symonds Pond Dam	Ruins	Timbercomb	0	15.00
152.04	L	Audio Accessories	Ashuelot River	Village Pond Dam	Active	Concrete	35	12.00
152.05	NM	Marlo Hydro LLC	Ashuelot River	Nash Mill Dam	Active	Concrete	2.5	20.00
152.06		Estate of Emma Downing	Ashuelot River	Ashuelot River Dam	Ruins	Timbercomb	0	7.00
152.07		Robert & Elizabeth Sharp	Butler Brook	Phelps Pond Dam	Breached	Earth	1.5	10.00
152.08	L	Sand Pond Assoc.	Tr. Ashuelot R.	Sand Pond Dam	Active	Earth/Stone	161	12
152.09		Jeff Meleenon	Unnamed Stream	Farm Pond Dam	Exempt	Earth	0.2	3.50
152.10	NM	Gallup & Hall	Unnamed Stream	Wildlife Pond dam	Active	Earth	8	10.00
152.11	NM	John Salo	Natural Swale	Wildlife Pond dam	Active	Earth	50	8.00
152.12		James Fay	Downing Brook	Fay Dam	Ruins	Earth	0.1	3.00
152.13		Unknown	Cohoos Pond	Cohoos Pond Dam	Ruins		0	0.00
152.14	NM	Gallup & Hall	Runoff	Christmas Trees Inn Fire Pond	Active	Concrete	0.5	6.00
152.15	NM	Robert Babson	Ashuelot River	Babson Pond Dam	Exempt	Earth	0.01	5.00

Source: Dam information provided by the NH Dam Bureau in 2012 and verified by Town officials

The maps on the following two pages show the locations of the dams, bridges and culverts in Marlow.

Map of Dams in Marlow



Town of Marlow Dams

Dams	Streams
Town Boundaries	Ponds
100-year Floodplain	Wetlands
Dam Inundation	NWI Wetlands

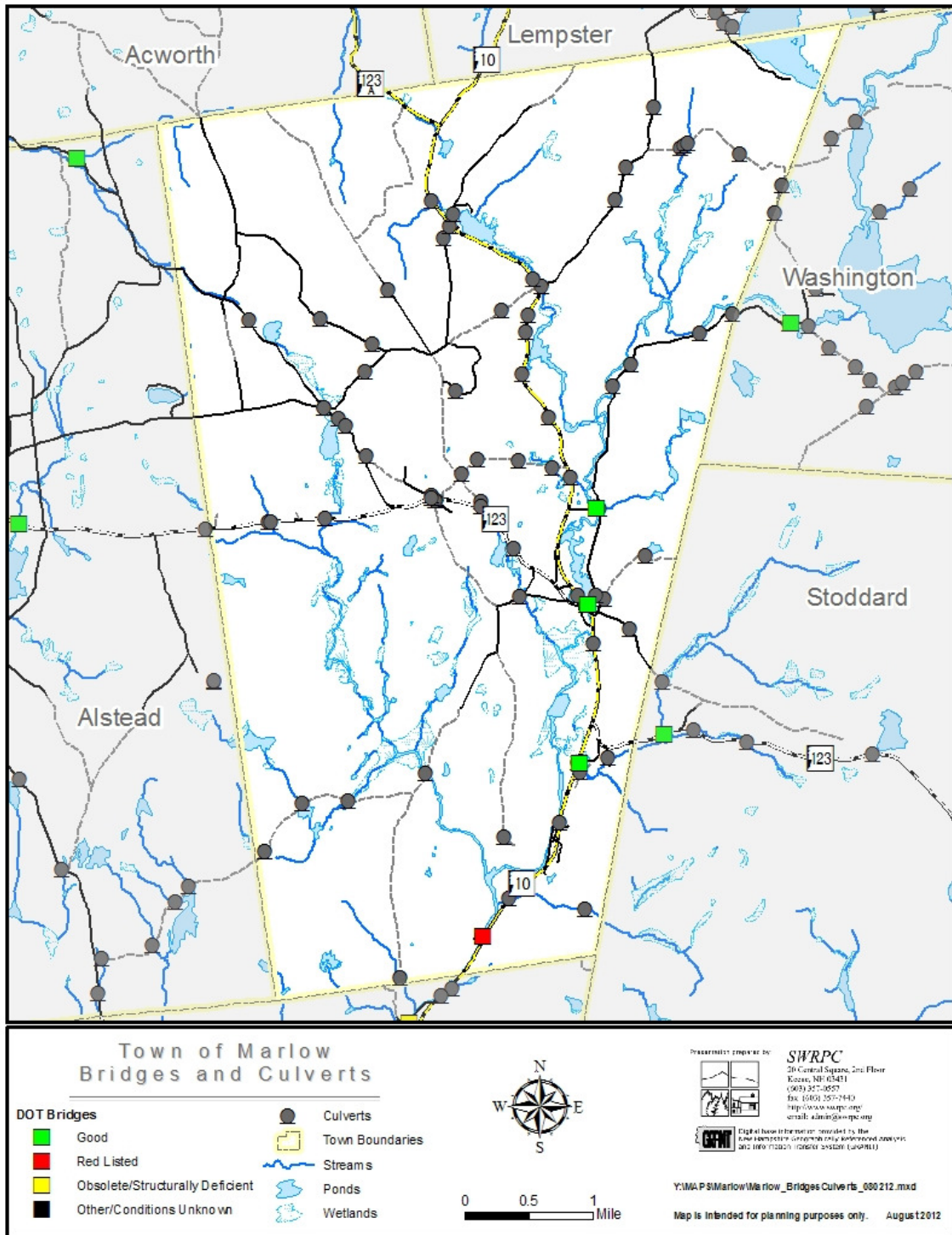
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Digital base information provided by the
 New Hampshire Geographic Information Analysis
 and Information Transfer System (GRANT)

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 Map is intended for planning purposes only.
 August 2012

Map of Bridges & Culverts in Marlow



CHAPTER IV: ASSESSING PROBABILITY, SEVERITY AND RISK

The Committee members completed a Risk Assessment all of the types hazards identified in Chapter III. **Appendix B** provides a detailed methodology for the Risk Assessment. The process involved assigning Low, Medium, or High values (numerically 1, 2 or 3) to each hazard type for its possible impact to Human, Property, and Business factors (vulnerability). (A score of zero was given if the hazard was non-applicable). To assess probability, a 1, 2, or 3 value was assigned to each hazard type with respect to the probability that the hazard would occur in the next 25 years (See **Appendix B** for specific methodology). The Severity was calculated by determining the average of the Human, Property, and Business impacts. Risk was calculated by multiplying severity by probability. Low-Medium-High (1-2-3) risk was assigned as shown below.

0-1.9- Low 2.0-3.9- Low-Med 4-5.9- Med 6-7.9- Med-High 8-9- High

Risk Assessment

	Human Impact	Property Impact	Business Impact	Probability	Severity	Risk	Risk
	Probability of death or injury	Physical Losses & damages	Interruption of Service	Likelihood this will occur in 25 years	Avg. of Human/Property/Business	Severity x Probability (Relative Threat)	
Flooding	1	1	1	3	1	3	Low-Med
Riverine Flooding	2	2	2	3	2	6	Med-High
Drought	1.5	.5	.5	2	.83	1.66	Low
Extreme Heat	.5	.5	.5	1	.5	1.5	Low
Wild Fire	2	2	1	2	1.67	3.34	Low-Med
Lightning	1	1	1	3	1	3	Low-Med
Tornado	1	1	1	1	1	1	Low
Hurricane	1	2	2	2	1.67	3.34	Low-Med
Earthquake	1	1	1	1	1	1	Low
Subsidence	1	1	1	1	1	1	Low
Radon	1	1	1	1	1	1	Low
Severe Wind	1	2	2	2	1.67	3.34	Low-Med
Extreme Winter Weather	1.5	2	2	3	1.83	5.49	Med
Snow Avalanche	0	0	0	0	0	0	Low
HazMat Spills	1	1	1	1	1	1	Low
Dam Failure	2	2	2	2	2	4	Med
Landslide	0	0	0	0	0	0	Low
Erosion	1	1	1	2	1	2	Low-Med

CHAPTER V: CRITICAL FACILITIES

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort
- Maintains an existing level of protection from hazards for the community
- Would create a secondary disaster if a hazard were to impact it

The Critical Facilities List for the Town of Marlow has been identified using the following four categories:

Category 1 - Emergency Response Facilities & Services:

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards

Category 2 - Non Emergency Response Facilities:

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Marlow.

Category 3 - Facilities/Populations to Protect:

The third category contains people and facilities that need to be protected in event of a disaster.

Category 4 - Potential Resources:

Contains facilities that provide potential resources for services or supplies

Type of Critical Facility	Name	Address	Comments
CATEGORY 1 - EMERGENCY RESPONSE FACILITIES & SERVICES			
Fire Station	Fire Station	123 NH 123	
Emergency Operations Center	EOC	167 NH 123	Also, Fire Station
Police Station	Police Station	18 Church Street	
Ambulance Service	Ambulance Service	123 NH 123	At the Fire Station
Town Hall	Jones Town Hall	12 Church Street	
Town Offices	Town Offices	167 NH 123	
Emergency Fuel Facilities	State Highway Garage	NH 10	
	Town Highway Garage	Old Forest Road	
Emergency Generators	Town Highway Garage	Old Forest Road	15 kw portable
	Perkins Elementary Sch.	919 NH 10	45 kw stationary
Dry Hydrants/Fire Ponds	Fire Pond	Ashuelot Pond (in Washington)	Only access is through Marlow
	Fire Pond	East of Mill Street	
Emergency Shelters	Town Offices	167 NH 123	
	Perkins Elementary Sch.	919 NH 10	
	Jones Hall	12 Church Street	
	Odd Fellows Hall	Church Street	Not yet identified in the emergency operations plan, but should be added.

CATEGORY 1 - EMERGENCY RESPONSE FACILITIES & SERVICES (CONT...)			
Helicopter Landing Sites	Perkins Elementary Sch.	919 NH 10	Ball Fields
	Christmas Tree Inn	Mansfield Rd	NH 10/NH 123
Primary Evacuation Routes	Primary Evacuation Routes	NH 10 and NH 123	
Hospitals	Cheshire Medical Center	Keene NH	18 miles
	Valley Regional	Claremont, NH	25 miles
Communications Facilities	Fairpoint Switching Station and cell tower	Telephone Road	Town Common-Marlow Hill
Utilities	Marlow Hydroelectric LLC	Along Ashuelot River	Hydroelectric Power Plant
CATEGORY 2 - NON EMERGENCY RESPONSE FACILITIES			
Problem Culverts	Problem Culvert	Sand Pond Rd and NH 10	This is a problem at least once per year
Transfer Station	Transfer Station	875 NH 10	
Secondary Evacuation Routes	Secondary Evacuation Routes	All roads leaving town	
CATEGORY 3 - FACILITIES/POPULATIONS TO PROTECT			
Recreation Areas	Marlow Profile-Bald Hill	NH 123 North	Rock Climbing Hill
	Boat Launch- Gustin Pond	Gustin Pond Road	
	Boat Landing- Sand Pond	West Shore Road	
	Boat Landing- Stone Pond	NH 10	
	Ball fields- Perkins Elementary	919 NH 10	
School	Perkins Elementary Sch	919 NH 10	
Employment Centers	Brazen Industries	Stone Pond Road	~6 employees
	Perkins Elementary Sch	919 NH 10	~10 employees
	Post Office	842 NH 10	~6 employees
	State Highway Garage	NH 10	~6 employees
	Audio Accessories	31 Mill Street	~20 employees
Apartment Complexes	Stone Pond Cottages	NH 10	8 separate units
	Main Street	Main Street	2 multifamily homes
Hazmat Storage	State Highway Garage	NH 10	Diesel and Gas
	Town Highway Garage	Old Forest Rd	Diesel and Gas
	Fairpoint Switching Sta.	Telephone Rd	Hydrochloric Acid
Post Office	Post Office	842 NH 10	
Church	Marlow Methodist Church	11 Church Street	
Historic Building	Jones Hall	12 Church Street	National & State Reg.
CATEGORY 4 - POTENTIAL RESOURCES			
Building Material/ Heavy Equipment	Contractor	Sargent Rd	Lots of Equipment
	State Highway Garage	NH 10	
	Town Highway Garage	Old Forest Rd	
	Private Residence	Sand Pond Road	Trucks
	Contractor	NH 10-south side of town	
Food/Water Storage	Marlow Methodist Church	11 Church Street	
	Odd Fellows Hall	Church Street	
Medical Supplies	Ambulance Bay/Fire Sta.	123 NH 123	

Gravel Pit	Cheshire Earth Sand & Gravel	Off of Whittemore Rd	Active
Gas	Highway Department	NH 10	

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CHAPTER VI: EXISTING MITIGATION STRATEGIES

This step involves identifying existing mitigation strategies and Town programs and evaluate their effectiveness. This section outlines those programs and recommends improvements to ensure the highest quality emergency services possible.

Existing Mitigation Strategies and Proposed Improvements

Existing Protection	Area Covered	Responsible Local Agent	Effectiveness	Proposed Improvements/Comments
School Evacuation Plan - the evacuation plan was recently rewritten.	School	School board	High	Shelter is Jones Hall
Building Codes - The town maintains a code enforcement officer and has adopted provisions of the NH Life Safety Code 2003 and the NH State Building Code which includes the International Building Code 2009, International Plumbing Code 2009, International Mechanical Code 2009, International Energy Conservation Code 2009 and National Electric Code 2008.	Town wide	Code Enforcement Officer	Medium	Update as needed
Code Enforcement Officer - Enforces building and zoning ordinances, reviews building permits	Town wide	Code Officer	Medium	1 Enforcement Officer
Local Road and Driveway Design Standards - Standards set by the town and the Highway Dept. The town has adopted the state standards	Town wide	Highway Dept	Medium	Update as needed
Local Road Maintenance Program - Town allocates money annually to various road projects including culvert replacement (there is a capital reserve fund for this).	Town wide	Highway Department	High	Capital Reserve Fund
Mutual Aid - provides assistance to all aspects of the town's emergency management services. Southwest NH Fire Mutual Aid and the Cheshire County Sheriff's Dept provide mutual aid.	Town wide	Fire and Police Depts.	High	This works well. Marlow will continue to participate.
Erosion and Sedimentation Plan - The Town follows the state's best management practices	Town wide	Planning Board	High	State regs are followed.
Shoreland Water Quality Protection Act - The Town follows the state's guidelines	Town wide	Planning Board	High	State regs are followed.
Floodplain Development Ordinance - The town has an ordinance to control development in the 100-year floodplain as required by FEMA to remain eligible for the National Flood Insurance Program.	Town wide	Planning Board	High	Maps at Town Office
Health Officer - Maintains state health requirements, inspects complaints.	Town wide	Health Officer	High	Continue inspecting complaints and maintaining state health requirements.
Emergency Management Plan - This plan establishes protocol for all town departments in the event of an emergency.	Town wide	EMD	Medium	Updated in 2008
Safety awareness - a public safety awareness is provided to schools and residents	Town wide	Fire Dept	High	Program at School
Ambulance Service - Marlow ambulance service responds to emergencies	Town wide	Ambulance	High	Good response.

Existing Protection	Area Covered	Responsible Local Agent	Effectiveness	Proposed Improvements/Comments
Fire Inspector - inspects commercial and multi-family dwellings. Single family homes inspected on a per-request basis	Town wide	Fire Dept	High	Continue procedures
Bridge Monitoring – State of New Hampshire DOT annually monitors the condition of all bridges throughout town.	Town wide	State DOT	High	State inspects all bridges
Master Plan – Updated every 5 years	Town wide	Planning Board	High	Update is in progress
Capital Improvements Program –Identifies major projects and expenditures for the town including potential road, culvert and bridge improvements to address flooding and erosion issues	Town wide	Planning Board; Board of Selectmen	High	Last CIP was for the years of 2006-2011; update being prepared.
Business Continuity Plan – This plan, when completed, will give guidance as to what to do in the case of a catastrophic event.	Town wide	Joint Loss Mgmt. Committee	Unknown	Being written currently.
Hazardous Material Response – Local Fire Department is trained in identifying hazardous materials; since Marlow emergency responders are dispatched out of Keene, any major hazardous material spills would result in an immediate response from HazMat Team in Keene	Town wide	Marlow Fire Department; Keene HazMat Team	High	Keene HazMat team responds
Pager Warning System – All Police and Fire Personnel have pagers and are notified immediately when needed for a response (was used in 2005 Flood to notify personnel that they needed to evacuate residents)	Town wide	Police and Fire Departments	High	Pager system works good
Phone Exchange System – Town has its own phone exchange system which allows them to call within town when phones are down in larger region; allows for contacting residents by phone if necessary	Town wide	Phone company	High	Many residents have eliminated land lines and replaced it with cell phone
Citizen Corps – Promote emergency preparedness through education of residents	Town wide	Citizen Corps	unknown	Looking for volunteers
Operating Budget – Storm drain repairs, tree removal and other maintenance issues are performed as needed	Town wide	Town	High	Funds projects
Smokey the Bear – sign at Fire Station notifying residents of fire danger levels	Town wide	Fire Department	High	Needs repainted, repaired or replaced
Emergency Preparedness Pamphlets – information for residents on a wide range of subjects including rabies, EEE, extreme cold, wildfire, among many others	Town wide	Citizen Corps	High	Good information for public
Fire Burn Permit System - permit system for burn permits works well in town.	Town wide	Fire Warden	High	Current system works good
Wetland Conservation District – Overlay zone for wetlands	overlay zone	Planning Board	High	Boundaries have been identified.
Sand Pond Homeowners' Association – Frequently teach and remind members about dangers and emergency practices for neighborhood	Sand Pond Residences	Homeowner Association	Medium	Continue through homeowner's association

The Hazard Mitigation Committee reviewed each Mitigation Action Item from the previous plan to determine the status of the proposed actions. A status of completed, deferred, or deleted is recorded in the table below.

Status of Previous Mitigation Action Items

Mitigation Action	Status	Explanation of Status
Hazardous Materials spill at the Gas Station/Store- Determine safer turn-around for tanker trucks	Completed	Changed location of turn-around.
Flooding- Make FEMA flood maps available to the public showing where flooding could take place potentially	Completed	Available in Town Office
Flooding Caused by Beaver Dams- Promote legislation at the state level to address beaver dam flooding issues	Deleted	Need to consider other method of beaver control.
All Hazards- Evacuation Plan to get students off-site (to Shelter)	Completed	2011
Winter Storms- Operations / Response Protocol for Town Staff in case regular responders are unavailable	Completed	Completed and continue on annual basis
Forest Fires- Educate students and residents about fire safety, especially campfires	Completed	Completed and continue on annual basis
Forest Fires- Create a Fire Pond – Dry Hydrant Management Plan	Completed	2009 Water Resource Management Plan
Forest Fires- Distribute pamphlets about fire safety and prevention to all residents	Completed	Completed and continue to distribute with Burn Permits.
Flooding- Continue to remain compliant with the NFIP	Completed	Completed and continue on annual basis
Ashuelot Pond Dam (in Washington)- Continue process by which the Ashuelot Pond Association notifies the town about the dam’s integrity (develop radio contact with someone who lives at the dam)	Completed	Completed and keep as a new mitigation action item since it is an on-going issue.
Flooding- Continue to update zoning ordinance and implement CIP to provide protection for new buildings from potential flooding events	Completed	Completed and keep as a new mitigation action item since it is an on-going issue.
All Hazards- Recruit more firefighters and emergency responders	Completed	Completed and keep as a new mitigation action item since it is an on-going issue.
All Hazards- Explore a reverse 911 system for notification in the case of a hazard	Deleted	Exploring other methods due to land lines being replaced with cell phones.
Flooding- Continue to distribute public information about the NFIP	Completed	Completed and keep as a new mitigation action item since it is an on-going issue.
Flooding Caused by Beaver Dams- Work with Fish & Game and/or UNH Cooperative Extension to educate residents about how to live with and manage the impacts of beaver dams	Completed	Completed

Mitigation Action	Status	Explanation of Status
Forest Fires- Seek more volunteers to help in fire safety/education, and for emergency response	Completed	Completed and keep as a new mitigation action item since it is an on-going issue.
Erosion Along Roadways (all locations)- Stricter steep slopes regulations	Deleted	Lack of town support.
Erosion Along Roadways (all locations)- Logging & Tree Removal Regulations as part of subdivision/site plan regs.	Deleted	Lack of town support.
Tornados, earthquakes, hurricanes, severe wind, avalanche, subsidence, radon - Send informational pamphlet to residents to reduce the effects of these potential hazards on life and property.	Completed	Completed and keep as a new mitigation action item since it is an on-going issue. Available at Town Offices.
All Hazards- Notify residents of location of shelter as well as what they should be prepared to bring with them	Completed	Completed and keep as a new mitigation action item. Include in the Annual Town Report.
All Hazards- Explore a better (i.e. heard throughout town & more durable) emergency warning system	Completed	Looking at alternatives; keep as a new mitigation action item.
Forest Fires- Sign onto FireWise Program to educate and promote property maintenance that minimizes damages in a wildfire	Deferred	Need support of the Board of Selectmen; keep as new mitigation action item.
All Hazards- Upgrade housing for emergency vehicles	Deferred	Need town support/ funding. Keep as new mitigation action item.
All Hazards- Identify and secure the use of suitable Emergency Shelter (school is unsuitable as it is located in flood zone if Ashuelot Pond Dam fails);	Completed	Jones Hall
Forest Fires- Fix dry hydrants; clean fire ponds	Deferred	In the process of doing this item.
All Hazards- Seek alternative location for EOC and supply the EOC properly	Completed	Fire Station is the alternative location.
Flooding- Purchase more high water/flooding signs and barricades to communicate road closures	Completed	More signage has been purchased.
Erosion Along Roadways (all locations)- Put stone in ditches to slow rate of water flow	Completed	Mitigation action completed.
Flooding Caused by Beaver Dams- Build Beaver Pipes to control water levels in dam locations	Completed	Done in one location
Flooding at Washington Pond Rd locations- Raise the road, increase size of culverts	Deferred	Lack of funding

CHAPTER VII: PROPOSED MITIGATION STRATEGIES

The following programs and activities are aimed at mitigating the effects of the identified potential hazards. As more information becomes available for other hazards that may have the potential to impact the town of Marlow, additional projects will be added to the Hazard Mitigation Plan. The identified projects are not only meant to address reducing the effects of hazards on existing buildings and infrastructure, but also to address reducing the effects of hazards on new buildings and infrastructure.

New Programs or Activities

In addition to the programs and activities that Marlow is currently undertaking to protect its residents and property from natural and manmade disasters, a number of additional strategies were identified by the Local Hazard Mitigation Committee for consideration. The process of compiling a comprehensive list of all mitigation strategies currently in place throughout the Town helped the Committee to identify gaps in the existing coverage and improvements which could be made to the existing strategies.

New strategies were identified for each general hazard type using the following categories:

- Prevention (programs and policies)
- Property Protection
- Structural Projects
- Emergency Services
- Public Education and Involvement

Location Specific Programs or Activities

In addition to the mitigation strategies proposed generally for each hazard type as indicated above, the Committee brainstormed actions for specific potential hazard areas identified in Chapter III. In these cases, the Committee felt that the risk to the location was so great, mitigation actions could be geared directly to mitigating hazards at that location.

The table below shows proposed mitigation actions for both general and specific potential hazard areas.

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
All Hazards			Investigate potential methods to implement a town-wide emergency warning system	Seek volunteers (Citizen Corp)	Include hazard mitigation information on town website.
				Recruit more firefighters and emergency responders	Explore implementation of the NIXLE system.
Tornados, earthquakes, hurricanes, severe wind, avalanche, subsidence, radon, all hazards					Maintain informational pamphlets at Town Offices for residents to reduce the effects of these potential hazards.

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
Ashuelot Pond Dam Failure / Flooding (location is in Washington)	Continue process by which the Ashuelot Pond Association notifies the town about the dam's integrity. Develop radio contact with someone who lives at the dam. Give them a radio to be able to communicate with officials			School Evacuation Plan to get students off-site (to Emergency Shelter)	
Winter Storms				Operations / Response Protocol for town staff in case regular responders are unavailable	
Forest Fires	Educate students and residents about fire safety, especially campfires	Sign onto FireWise Program to educate and promote property maintenance that minimizes damages in a wildfire	Fix dry hydrants; clean fire ponds Prepare a Fire Pond – Dry Hydrant Management Plan	Seek more volunteers to help in fire safety/education, and for emergency response	Distribute pamphlets about fire safety and prevention to all residents
Erosion Along Roadways (all locations)	Enforce Logging & Tree Removal Regulations				
Flooding at Washington Pond Rd locations			Raise the road, increase size of culverts		
Flooding	Continue to remain compliant with the NFIP				Continue to inform public about the NFIP.

Prioritization of Proposed Mitigation Strategies

The goal of each strategy identified in the previous table is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each strategy. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation strategies and discussed in the table below:

- **Social:** Is the proposed strategy socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- **Technical:** Will the proposed strategy work? Will it create more problems than it solves?
- **Administrative:** Can the community implement the strategy? Is there someone to coordinate and lead the effort?
- **Political:** Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
- **Legal:** Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
- **Economic:** What are the costs and benefits of this strategy? Does the cost seem reasonable for the size of the problem and the likely benefits?
- **Environmental:** How will the strategy impact the environment? Will the strategy need environmental regulatory approvals?

Each mitigation strategy was evaluated and assigned a score (Good/Yes = 3, Average = 2, Poor/No = 1) based on the above criteria. An evaluation chart with total scores for each strategy can be found in the following table. Each strategy was evaluated and prioritized according to the final score. The highest scoring strategies were determined to be of **greatest feasibility**, economically, socially, environmentally, and politically.

An additional factor that is not considered here but should be considered by the Committee on a project-by-project basis is the ability to find funding.

STAPLEE Feasibility/Priority Ranking Matrix

Proposed Mitigation Strategy	Is it Socially acceptable?	Is it Technically feasible/ potentially successful?	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environmentally beneficial?	Total Score
Sign on to Fire Wise Program	3	3	3	3	3	3	3	21
Encourage residents with structures within the flood zone to purchase NFIP policies-distribute information	3	3	3	3	3	3	3	21
Include hazard mitigation information on Town website	3	3	3	3	3	3	3	21
Improvements to Marlow Hill Road (ditch improvements, erosion control, pitch of the road, etc)	3	3	3	3	3	3	3	21
Update the Marlow EOP	3	3	3	3	3	3	3	21
Install new Fire Danger Sign	3	3	3	3	3	3	3	21
Create a warning system on the Town Website to notify residents of severe weather events or man-made dangers	3	3	3	3	3	3	3	21
Install generator in Emergency Operations Center	3	3	3	3	3	3	3	21
Investigate potential methods to implement a town-wide warning system	3	3	3	3	3	3	3	21
Update the Marlow EOP	3	3	3	3	3	3	3	21
Obtain a portable generator	3	3	3	3	3	3	3	21
Construct a garage for fire trucks	3	3	3	3	3	3	3	21
Continue to seek additional volunteers to serve on Citizen Corp to assist during emergency/ weather events	3	3	3	3	3	3	3	21
Install Dry Hydrants	3	3	2	3	2.5	3	3	19.5

CHAPTER VIII: PRIORITIZED IMPLEMENTATION SCHEDULE AND ACTION PLAN MITIGATION ACTION PLAN

The following questions were asked to develop an implementation schedule for the identified priority mitigation strategies:

WHO? Who will lead the implementation efforts, funding requests, and applications?

WHEN? When will these actions be implemented, and in what order?

HOW? How will the community fund these projects? What resources are needed for implementation?

A fourth consideration was the cost/benefit of each proposed action. Comments regarding the cost/benefit of each project are included, along with the “who,” “when,” and “how” in the table on the following page. As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

Mitigation Action	Who (Leadership)	When	How (Cost and Funding Source)	Cost/ Benefit Comments
Sign on to Fire Wise Program	Fire Chief	2013-2014	\$500; Many volunteer hours, grant & town budget	Benefits outweigh costs
Encourage residents with structures within the flood zone to purchase NFIP policies-distribute information	Emergency Management Director	2014	\$100; town budget	Benefits outweigh costs
Include hazard mitigation information on Town website	Board of Selectmen	2013	\$2,500; town budget	Benefits outweigh costs
Improvements to Marlow Hill Road (improve ditching, erosion control)	Road Agent	2013-2014	\$300,000; Grant & town budget	Extremely beneficial
Update the Marlow Emergency Operations Plan	Emergency Management Director	2013-2014	\$5,000-10,000;HSEM/FEMA grant & town budget	Benefits outweigh costs
Install new Fire Danger Sign	Fire Chief	2013-2014	\$500; grant & town budget	Benefits outweigh costs
Create a warning system on the Town Website to notify residents of severe weather events or man-made dangers	Board of Selectmen	2013	\$5,000 initial cost/ \$2,000 yearly; town budget	Very beneficial
Install generator in Emergency Operations Center	Board of Selectmen	2013-2014	\$30,000; grant & town budget	Benefits outweigh costs
Investigate potential methods to implement a town-wide warning system	Board of Selectmen	2015-2016	\$5,000-\$50,000(cost will vary depending on method); EMPG grants & town budget	Benefits outweigh costs
Obtain a portable generator	Board of Selectmen	2013-2014	\$10,000; grants & town budget	Extremely beneficial
Construct a garage for firetrucks	Fire Chief	2013-2014	\$350,000-\$500,000; grants & town budget	Required. Very beneficial
Continue to seek additional volunteers to serve on Citizen Corp to assist during emergency/ weather events	Executive Administrator	2013-2018	Under \$100	Benefits outweigh the costs
Install Dry Hydrants	Fire Chief	2013-2017	\$5,000/hydrant; grant & town budget	Benefits outweigh costs

CHAPTER IX: ADOPTION, IMPLEMENTATION, MONITORING & UPDATE

Adoption

The Marlow Board of Selectmen adopted the Marlow Hazard Mitigation Plan Update 2013 on *(date)*. A copy of the resolution can be found at the end of this chapter. Adopted policy addresses the actions for implementation set forth in the prioritized implementation schedule (action plan) in the previous chapter and in the “Monitoring & Updates” sub-section contained in this Chapter. All other sections of this Plan are supporting documentation for information purposes only and are not included as the statement of policy.

A copy of the public hearing notice for the Board of Selectmen meeting at which the plan was adopted is included in **Appendix E**. The plan was available to the public via a hard copy at the Town Offices prior to the Selectmen meeting. Any comments were considered and addressed prior to adoption of the plan.

Implementation of the Plan through Existing Programs

In addition to work by the Hazard Mitigation Committee and town departments, several other mechanisms exist which will ensure that the Marlow Hazard Mitigation Plan Update 2013 receives the attention it requires for satisfactory use.

Master Plan

Implementation of the Master Plan has been ongoing since its most recent adoption in 2003. Where appropriate, recommendations from the Marlow Hazard Mitigation Plan Update 2013 will be inserted into future updates of the Master Plan. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to encourage that the Marlow Hazard Mitigation Plan Update 2013 is adopted as a Chapter of the Master Plan.

Zoning Ordinance and Regulations

Some of the implementation strategies proposed involve revisions to the Subdivision Regulations and/or the Site Plan Review Regulations as well as the Zoning Ordinance. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to develop appropriate language for the recommended modifications.

Continued Public Involvement

On behalf of the Hazard Mitigation Committee, the Emergency Management Director (EMD), under direction of the Board of Selectmen, will be responsible for ensuring that town departments and the public have adequate opportunity to participate in the planning process. Administrative staff may be utilized to assist with the public involvement process. For the yearly update process, techniques that may be utilized for public involvement include:

- Provide personal invitations to Budget Committee members;
- Provide personal invitations to town department heads;
- Post notices of meetings at the Town Office, Library, and local businesses;
- Post flyers of the project at the Town Office, Library, and local businesses; and
- Submit newspaper articles for publication appropriate newspapers.
- Town website

A number of Implementation Action items that will be undertaken relate to public education and involvement. Additionally, members of the public including area business owners, schools, communities, and organizations will be invited to participate in the yearly process of updating the Marlow Hazard Mitigation Plan. These outreach activities will be undertaken during the Plan's annual review and during any Hazard Mitigation Committee meetings the Board of Selectmen calls to order. For all meetings regarding the Hazard Mitigation Plan, the public will be noticed and the meetings will be open to the public.

Monitoring & Updates

Recognizing that many mitigation projects are ongoing, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the Plan where necessary.

In order to track progress and update the Mitigation Strategies identified in the Implementation Plan (Chapter IX), the Town Hazard Mitigation Committee will revisit the Marlow Hazard Mitigation Plan Update 2013 annually, or after a hazard event. The Committee will review the plan prior to town budgeting so that projects that will be completed with budgeted funds can be appropriated and planned. The executive administrator will initiate the organization of the annual review meeting.

Changes should be made to the Plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with the timeframe, the community's priorities, and funding resources. Priorities that did not make the implementation list, but identified as potential mitigation strategies, should be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation. In keeping with the process of adopting the Marlow Hazard Mitigation Plan Update 2013, a public hearing to receive public comment on Plan maintenance and updating will be held during the annual review period and the final product adopted by the Board of Selectmen appropriately.

Monitoring of the plan shall include periodic reports, meetings, site visits, and phone calls. The projects identified in this plan will be evaluated to make sure they are still applicable and practical. When the plan is evaluated, any changes should be incorporated into the plan in the annual update.

Appendix G is meant to assist in the monitoring and evaluation of the plan on an ongoing basis.

The Marlow Hazard Mitigation Plan Update 2013 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval every **five years** in order to maintain eligibility for Pre-Disaster Mitigation Competitive (PDM-C) and Hazard Mitigation Grant Program project grants.

FEMA Final Approval: (date)

CERTIFICATE OF ADOPTION
TOWN OF MARLOW NEW HAMPSHIRE
BOARD OF SELECTMEN
A RESOLUTION ADOPTING THE MARLOW
HAZARD MITIGATION PLAN UPDATE 2013

WHEREAS, the Town of Marlow established a Committee to prepare the Marlow Hazard Mitigation Plan Update 2013; and

WHEREAS, several public planning meetings were held in 2012 regarding the development and review of the Marlow Hazard Mitigation Plan Update 2013; and

WHEREAS, the Marlow Hazard Mitigation Plan Update 2013 contains several potential future projects to mitigate hazard damage in the Town of Marlow and

NOW, THEREFORE BE IT RESOLVED that the Marlow Board of Selectmen adopt the Marlow Hazard Mitigation Plan Update 2013.

ADOPTED AND SIGNED this _____.

Chair
Board of Selectmen

ATTEST

Appendices

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Appendix A: Hazard Descriptions

The following list describes hazards that have occurred or have the potential to occur in the Town of Marlow. The descriptions provided are those used in the State of NH Hazard Mitigation Plan.

Flooding

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges. Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to go.

100-year Floodplain Events

- Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term 100- year flood does not mean that a flood will occur once every 100 years. Rather, it is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase “1% annual chance of flood.” What this means is that there is a 1% chance of a flood of that size happening in a year.

Rapid Snow Pack Melt

- Warm temperatures and heavy rains cause rapid snowmelt. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

River Ice Jams

- Rising waters in early spring breaks ice into chunks, which float downstream and often pile up, causing flooding. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice collecting in river bends and against structures presents significant flooding threats to bridges, roads, and the surrounding lands.

Severe Storms

- Flooding associated with severe storms can inflict heavy damage to property. Heavy rains during severe storms are a common cause of inland flooding.

Beaver Dams and Lodging

- Flooding associated with beaver dams and lodging can cause road flooding or flooding damage to property.

Drought

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are rare in New Hampshire. They generally are not as damaging and disruptive as floods and are more difficult to define. The effect of droughts is indicated through measurements of soil moisture, groundwater levels, and stream-flow. However, not all of these indicators will be minimal during a drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground-water levels or increasing stream-flow. Low stream-flow correlates with low ground-water levels because ground-water discharge to streams and rivers maintains stream flow during extended dry periods. Low stream-flow and low ground-water levels commonly cause diminished water supply.

Extreme Heat

Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. These event conditions may impact the health of both humans and livestock.

Wildfire

Wildfire is defined as an uncontrolled and rapidly spreading fire. A forest fire is an uncontrolled fire in a

woody area. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. Grass fires are uncontrolled fires in grassy areas.

Earthquake

New England is considered a moderate risk earthquake zone. An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric, water and phone lines, and often cause landslides, flash floods, fires, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and Mercalli scale.

Subsidence

The collapse of the Earth's surface elevation due to the removal of subsurface support. Events range from broad regional lowering of the land surface that occurs over long periods of time, to sudden localized collapse.

Radon

Radon is a naturally occurring radioactive gas with carcinogenic properties. The gas is a common problem in many states, including New Hampshire. Data collected by the NH Office of Community and Public Health's Bureau of Radiological Health indicates that one third of the houses in New Hampshire have indoor radon levels that exceed the U.S. Environmental Protection Agency's "action level" of four Pico curies per liter for at least some portion of the year. Radon may also enter homes dissolved in drinking water from drilled wells. A higher level of radon in water from individual drilled wells is a common occurrence in New Hampshire.

Tornado

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down they become a force of destruction.

Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage.

The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison to a hurricane, a tornado covers a much smaller area but can be more violent and destructive.

Hurricane

A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and may extend over 400 miles. High winds and flooding are primary causes of hurricane-inflicted loss of life and property damage.

Severe Wind

Significantly high winds occur especially during tornadoes, hurricanes, winter storms and thunderstorms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during severe wind occurrences.

A downburst is a severe, localized wind blasting down from a thunderstorm. These “straight line” winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories:

- Microburst, which covers an area less than 2.5 miles in diameter, and
- Macrobust, which covers an area at least 2.5 miles in diameter.

Lightning

Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the sun. Fires are a likely result of lightning strikes, and lightning strikes can cause death, injury, and property damage.

Extreme Winter Weather

Ice and snow events typically occur during the winter months and can cause loss of life, property damage and tree damage.

Heavy Snow Storms

- A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding, wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.

Ice Storms

- An ice storm involves rain, which freezes on impact. Ice coating at least one-fourth inch of thickness is heavy enough to damage trees, overhead wires and similar objects. Ice storms often produce widespread power outages.

Nor'easter

- A Nor'easter is a large weather system traveling from South to North passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic winds impact the coast and inland areas from a Northeasterly direction. The sustained winds may meet or exceed hurricane force, with larger bursts, and may exceed hurricane events by many hours (or days) in terms of duration.

Snow Avalanches

A snow avalanche is a slope failure consisting of a mass of rapidly moving, fluidized snow that slides down a mountainside. The flow can be composed of ice, water, soil, rock and trees.

Man-Made Hazards

Hazardous Materials

- Hazardous materials spills or releases can cause damage of loss to life and property. Short or longterm evacuation of local residents and businesses may be required, depending on the nature and extent of the incident.

Dam Breach and Failure

- Dam failure results in rapid loss of water that is normally held by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property.

Appendix B: Risk Assessment

The following terms are used to analyze the hazards considered. High, Medium and Low are synonymous with 3, 2 and 1, respectively.

VULNERABILITY- An adjective description (High, Medium, or Low) of the potential impact a hazard could have on the town relating to human, business and property impacts. It is the ratio of population, property, commerce, infrastructure and services at risk relative to the entire town. Vulnerability is an estimate generally based on a hazard's characteristics, information obtained by the various town departments.

HIGH: The total population, property, commerce, infrastructure and services of the town are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worse case scenario there could be a disaster of major to catastrophic proportions.

MEDIUM: (1) The total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard of moderate influence; or (2) the total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard, but not all to the same degree; or (3) an important segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worse case scenario there could be a disaster of moderate to major, though not catastrophic, proportions.

LOW: A limited area or segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worse case scenario there could be a disaster of minor to moderate proportions.

PROBABILITY OF OCCURRENCE - An adjective description (High, Medium, or Low) of the probability of a hazard impacting the town within the next 25 years. Probability is based on a limited objective appraisal of a hazard's frequency using information provided by relevant sources, observations and trends.

HIGH: There is great likelihood that a hazardous event will occur within the next 25 years (1-2 events each year).

MEDIUM: There is moderate likelihood that a hazardous event will occur within the next 25 years (1-2 events each 5-10 years).

LOW: There is little likelihood that a hazardous event will occur within the next 25 years (1 event in 25 years).

SEVERITY - Calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

RISK - An adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 25 years. It is calculated by multiplying the probability of occurrence and vulnerability.

HIGH: (1) There is strong potential for a disaster of major proportions during the next 25 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 25 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from,

and mitigate against this hazard. This hazard should be a major focus of the town's emergency management training and exercise program.

MEDIUM: There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be included in the town's emergency management training and exercise program.

LOW: There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

DRAFT

Appendix C: Resources

Resources Used in the Preparation of this Plan

- NH HSEM’s *State of New Hampshire Natural Hazards Mitigation Plan* (2010)
 SWRPC’s *Hazard Mitigation Planning for New Hampshire Communities* (10/02)
 FEMA’s *Understanding Your Risks: Identifying Hazards and Estimating Losses*, August 2001
 FEMA’s *Local Multi-Hazard Mitigation Planning Guidance*, July 1, 2008
 Town of Marlow, NH’s Master Plan
 Town of Marlow Annual Report 2011
 Town of Marlow Hazard Mitigation Plan (2007)

Agencies

New Hampshire Homeland Security and Emergency Management (HSEM)	271-2231
Field Representative Hillsborough County	271-2231
Field Representative Cheshire County	271-2231
Preparedness Planner:	271-2231
Federal Emergency Management Agency (FEMA)	877-336-2734
NH Regional Planning Commissions:	
Central NH Regional Planning Commission	226-6020
Lakes Region Planning Commission	279-8171
Nashua Regional Planning Commission	424-2240
North Country Council	444-6303
Rockingham Planning Commission	778-0885
Southern New Hampshire Planning Commission	669-4664
Southwest Region Planning Commission	357-0557
Strafford Regional Planning Commission	994-3500
Upper Valley Lake Sunapee Regional Planning Commission	448-1680
NH Executive Department:	
Governor’s Office of Energy and Community Services	271-2611
NH Department of Cultural Resources:	271-2540
Division of Historical Resources	271-3483
NH Department of Environmental Services:	271-3503
Air Resources	271-1370
Air Toxins Control Program	271-0901
Asbestos Program	271-1373
Childhood Lead Poisoning Prevention Program	271-5733
Environmental Health Tracking Program	271-4072
Environmental Toxicology Program	271-3994
Health Risk Assessment Program	271-6909
Indoor Air Quality Program	271-3911
Occupational Health and Safety Program	271-2024
Radon Program	271-4764
Geology Unit	271-3503
Pollution Preventive Program	271-6460
Waste Management	271-2900
Water Supply and Pollution Control	271-3414
Rivers Management and Protection Program	271-8801
NH Office of Energy & Planning (OEP)	271-2155
Jennifer Gilbert, State Coordinator, Floodplain Management	271-1762
NH Municipal Association	224-7447
NH Fish and Game Department	271-3421
Region 1, Lancaster	788-3164
Region 2, New Hampton	744-5470

Region 3, Durham	868-1095
Region 4, Keene	352-9669
NH Department of Resources and Economic Development:	271-2411
Economic Development	271-2629
Travel and Tourism	271-6870
Division of Forests and Lands	271-2214
Division of Parks and Recreation	271-3556
Design, Development, and Maintenance	271-2411
NH Department of Transportation	271-3734
Northeast States Emergency Consortium, Inc. (NESEC)	(781) 224-9876
US Department of Commerce:	(202) 482-2000
NOAA: National Weather Service; Taunton, Massachusetts	(508) 824-5116
US Department of the Interior:	202-208-3100
US Fish and Wildlife Service	225-1411
US Geological Survey	225-4681
US Army Corps of Engineers	(978) 318-8087
US Department of Agriculture:	
Natural Resource Conservation Service	868-7581
Cheshire County, Walpole	756-2988
Sullivan County, Newport	863-4297
Hillsborough County, Milford	673-2409 Ext. #4

Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP).....	NH Homeland Security and Emergency Management
406 Public Assistance and Hazard Mitigation.....	NH Homeland Security and Emergency Management
Community Development Block Grant (CDBG).....	NH HSEM, NH OEP, also refer to RPC
Dam Safety Program	NH Department of Environmental Services
Emergency Generators Program by NESEC [‡]	NH Homeland Security and Emergency Management
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP)	NH HSEM, NH OEP
Flood Plain Management Services (FPMS)	US Army Corps of Engineers
Mitigation Assistance Planning (MAP)	NH Bureau of Emergency Management
Mutual Aid for Public Works.....	NH Municipal Association
National Flood Insurance Program (NFIP) [†]	NH OEP, NH HSEM
Power of Prevention Grant by NESEC [‡]	NH Bureau of Emergency Management
Project Impact	NH Bureau of Emergency Management
Roadway Repair & Maintenance Program(s).....	NH Department of Transportation
Section 14 Emergency Stream Bank Erosion & Shoreline Protection	US Army Corps of Engineers
Section 103 Beach Erosion	US Army Corps of Engineers
Section 205 Flood Damage Reduction	US Army Corps of Engineers
Section 208 Snagging and Clearing	US Army Corps of Engineers
Shoreline Protection Program	NH Department of Environmental Services
Various Forest and Lands Program(s).....	NH Department of Resources and Economic Development
Wetlands Programs	NH Department of Environmental Services

[‡]NESEC - Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH BEM for more information or visit the Consortium’s website at <http://www.nesec.org/index.cfm>.

[†] Note regarding **National Flood Insurance Program (NFIP)** and **Community Rating System (CRS)**:
 The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community’s floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. The NH Office of Energy & Planning can provide additional information regarding participation in the NFIP-CRS Program.

Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/hazards/	Searchable database of references and links to many disaster-related websites.
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA - Goddard Space Flight Center "Disaster Finder:	http://disasterfinder.gsfc.nasa.gov/Disaster_Management/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://gcmd.gsfc.nasa.gov/index.html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://waterdata.usgs.gov/nwis/rt	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/~floods	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.shtm	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://thunder.msfc.nasa.gov/research.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://www.llnl.gov/hmc/	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoproject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.noaa.gov/	Information about and tracking of severe storms.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.
FEMA, NFIP Public Awareness (Free) Materials Orders Web Site	http://www.fema.gov/library/	FEMA website to order free educational materials
Firewise Communities	http://www.firewise.org/	Information to help reduce risk of wildland fires.
Municipal Research and Services Center of Washington (State) Web Site on Wildfire Prevention	http://www.mrsc.org/subjects/pubsafe/wildfire.aspx	Excellent number of resources related to wildfire prevention
Franklin County (Washington) Emergency Management, Fact Sheet on Wildland Fires	http://www.franklinem.org/wildfires.html	Provides information related to reducing risk of wildland fires.

Appendix D: Hazard Mitigation Resource Profiles

U.S. Army Corps of Engineers

Contacts:

John Kennelly, Chief, Special Studies Section (for Flood Plain Management Services activities),
Phone: (978) 318-8505, Fax: (978) 318-8080, E-mail: John.R.Kennelly@usace.army.mil

Mike Keegan, Chief, Project Planning Section (for Section 14, 103, and 205 authorities),
Phone: (978) 318-8087, Fax: (978)318-8080, E-mail: Michael.F.Keegan@usace.army.mil

Address: US Army Corps of Engineers
New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Description and Mission:

The Corps of Engineers is a multi-disciplinary engineering and environmental organization that has been identifying and meeting the water resources needs of the nation. These needs have been in the areas of flood damage reduction, flood plain information and management, navigation, shore protection, environmental restoration, water supply, streambank protection, recreation, and fish and wildlife resources conservation, as well as technical assistance in other water resources areas.

The New England District (NAE) of the Corps of Engineers is responsible for managing the Corps' civil responsibilities in a 66,000 square-mile region encompassing the [six New England states](#) east of the Lake Champlain drainage basin. The District and its [leadership](#) are headquartered in Concord, Massachusetts. The missions of the New England District are many and varied. They include:

- flood damage reduction
- navigation improvements and maintenance
- natural resource management
- streambank and shoreline protection
- disaster assistance
- environmental remediation and engineering
- engineering and construction management support to other agencies

Flood Mitigation Involvement:

As a result of the catastrophic floods in 1936, 1938 and 1955, the Corps was called upon to undertake a comprehensive flood damage reduction program. Since then the Corps has built many flood control structures throughout New England. These include 35 dams and reservoirs, five hurricane protection barriers (two are operated by the Corps) and approximately 60 local flood protection projects. The New England District has also completed two nonstructural projects involving the relocation of flood prone property and the acquisition of natural flood storage areas. The Corps also provides technical assistance to states and municipalities in locally constructed flood damage mitigation projects and to promote wise and informed use of floodplain and natural retention areas in order to minimize potential future flood damages.

Mitigation Goals and Objectives:

The New England District has two primary mitigation objectives with respect to flood damage reduction. The first objective is the operation and maintenance of the 35 flood control reservoirs and two hurricane barriers that provide protection to the Connecticut, Merrimack, Thames, Naugatuck, and Blackstone River Basins. The second objective is to continue to work with the states and communities in New England to address flooding problems affecting the region.

Projects Desired: *The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria.*

COE Resources with Respect to Hazard Mitigation:

The New England Division assists in meeting national, regional and local needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

Section 14 - Emergency Stream Bank & Shoreline Protection: This work consists of evaluating alternatives to provide emergency protection to public facilities, such as highways and bridges that are threatened due to erosion. The current Federal limit on Section 14 projects is \$500,000. The local sponsor is required to provide 25 percent of the cost of developing plans and specifications and of construction.

Section 103 - Beach Erosion: Investigations conducted under this authority are to determine methods of protecting public facilities that have been threatened by beach erosion. Currently there is a Federal limit of \$2,000,000 and the local sponsor is required to contribute 35 percent of plans, specifications and construction. The local sponsor is also required to cost-share equally the cost of the feasibility investigation that exceeds \$100,000. The first \$100,000 is at full Federal expense.

Section 205 - Flood Damage Reduction: Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

Section 208 - Snagging and Clearing: This emergency program is designed to reduce flood damage potential by identifying and removing obstructions that contribute to flooding by causing higher flood stages in the floodways. The Federal limit under this program is \$500,000 and the local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

The New England Division also has two Planning Assistance Programs, which provide opportunities for the States to obtain assistance in addressing water resource issues. These programs are the Section 22, Planning Assistance to the States (PAS) program and the Section 206, Flood Plain Management Services (FPMS) program.

Planning Assistance to States Program (PAS): The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Hazard Mitigation Resource Profile

Ice Engineering Research Division U.S. Army Cold Regions Research and Engineering Laboratory

Contact:

Dr. J-C Tatinclaux, Chief, Ice Engineering Research Division

Phone: (603) 646-4187 Fax: (603) 646-4477

E-mail: Jean-Claude.Tatinclaux@crl02.usace.army.mil

Website: <http://www.crrel.usace.army.mil/ierd/>

Address: US Army Cold Regions Research and Engineering Laboratory
Ice Engineering Research Division
72 Lyme Road
Hanover, NH 03755-1290

Description and Mission:

The US Army Cold Regions Research and Engineering Laboratory (CRREL) is a Corps of Engineers' research laboratory that is dedicated to multi-disciplinary engineering and research that addresses the problems and opportunities unique to the world's cold regions. CRREL exists largely to solve the technical problems that develop in cold regions, especially those related to construction, transport, and military operations. Most of these problems are caused by falling and blowing snow, snow on the ground, ice in the air and in the ground, river ice, ice on seas and lakes, and ice affects on manmade materials. CRREL serves the Corps of Engineers and its clients in three main areas:

- Traditional military engineering, which deals with problems that arise during conflict;
- Military construction and operations technology, i.e., the building and maintenance of military bases, airfields, roads, ports, and other facilities; and
- Civil works, which involves the Corps in such things as flood protection, navigation on inland waterways and coastal engineering.

CRREL also deals with cold regions problems for the other defense services, for civilian agencies of the federal government, and to some extent for state agencies, municipalities, and private industry.

CRREL's Ice Engineering Research Division (IERD) was created to research, analyze and solve ice problems in and around water bodies, including ice jam flooding and ice accumulation in lock chambers, to ice buildup at water intakes and the destructive forces that moving ice exerts on riverine or coastal structures. In cooperation with the New England District (NAE) of the Corps of Engineers (located in Concord, MA), IERD personnel provide technical assistance before, during, and after ice jam flood emergencies. IERD research has resulted in the design and construction of a number of low-cost ice control structures as well as nonstructural mitigation

measures. IERD also provides instruction on dealing with river ice problems to local emergency management agencies.

Flood Mitigation Involvement:

IERD is frequently called upon by the various Corps Districts to provide technical assistance to states and municipalities in the form of emergency mitigation. IERD is also involved with Corps and local agencies in developing locally constructed flood damage mitigation projects and promoting wise and informed use of floodplain areas in order to minimize potential future flood damages.

Mitigation Goals and Objectives:

The IERD has two primary mitigation objectives with respect to flood damage reduction. The first objective is to work with the Corps and other federal, state, and local agencies to design and implement ice control methods to reduce ice-related flood potential. The second is to work with the states and communities in nationwide as well as in New England to address ice-related emergency flooding problems affecting the region.

Projects Desired: CRREL and IERD are a national resource ready to apply our unique facilities and capabilities to solve problems and conduct innovative, state-of-the-art research and technical support. There are a number of mechanisms that enable IERD and the rest of CRREL to partner with various Federal, non-DoD and private sector entities. The Federal Technology Transfer Act of 1986 (15 USC 3710a) allows CRREL to collaborate with any non-Federal partner on research and technical support consistent with the mission of the laboratory. The Intergovernmental Cooperation Act (31 USC 6505) lets CRREL work with state and local governments on a broad range of reimbursable projects. Under the "Authority to Sell" (10 USC 2539b), CRREL can provide test and evaluation services to the states and the private sector. This includes the testing and evaluation of materials, equipment, models, computer software, and other items. The laboratory can also provide support to other Federal agencies via the Economy in Government Act (31 USC 1535) through MOUs/MOAs that establish a framework for the partnership and provide a concise description of the planned work. CRREL's 35 active Cooperative Research and Development Agreements (CRADAs) with industry and academia and 17 Intergovernmental Cooperation Agreements with states and local governments in 1998 demonstrate a robust program in this area and the relevance of CRREL's research to many segments of American society beyond DoD.

The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria. Through the Corps, IERD has been involved in Section 205 Flood Damage Reduction program, Section 22 Planning Assistance to

States Program (PAS)) projects, the Section 206 Flood Plain Management Services (FPMS) program funded jointly with FEMA, and numerous instances of technical assistance.

CRREL IERD Resources with Respect to Hazard Mitigation:

Corps: CRREL works jointly with the Corps' New England Division to address regional and local ice-related hazard mitigation needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

Section 205 - Flood Damage Reduction: Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

Section 22 - Planning Assistance to States Program (PAS): The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

Section 206 - Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Personnel:

IERD was created to research, analyze and solve ice problems in and around water bodies. The technical experience of the staff and their in-depth research and field capabilities combine with CRREL's unique Ice Engineering Facility to form one of the premier ice engineering organizations in the world. IERD has a staff of 15 engineers and technicians experienced in technical analyses, methods, and engineering solutions to ice problems -- that is, any situation where the effects of ice cause flooding, increase operational and maintenance requirements of water control projects, impede navigation, or adversely impact the environment in cold regions.

Equipment and Facilities:

The Ice Engineering Facility was built to increase the research capabilities of the U.S. Army Cold Regions Research and Engineering Laboratory. It is a two-story building approximately 160 by 210 feet containing three primary cold spaces: the test Basin, Flume, and Research Area. We have recently designed and built a new Wind Tunnel Facility. In addition there is a machine room in the basement, an instrumentation corridor separating the flume and test basin spaces, a shop/storage area, and one sample-storage cold room.

The Test Basin was designed primarily for large-scale work on ice forces on structures, such as drill platforms and bridge piers, and for tests using model icebreakers. The Basin is 30 feet wide, 8 feet deep and 120 feet long. The room is designed to operate at any temperatures between +65° and -10°F with very even temperature distribution, which results in uniform ice thickness. Other studies conducted in the Test Basin concern the formation of ice pressure ridges, ice problems in and around navigation locks, and vertical uplift forces.

The Flume is situated in a room where the temperature can be regulated between +65° and -20° F. The Flume is 2 by 4 feet in cross section and 120 feet long. It can tilt from +2° to -1° slope, have a flow capacity of nearly 14 cubic feet per second and have a refrigerated bottom. Some other studies conducted in the Flume are the formation of ice covers and frazil ice, the hydraulics of ice-covered rivers, the formation of ice jams, and the effect of ice covers on sediment transport and scour.

Possibly the most versatile portion of the Ice Engineering Facility is the Research Area. This room is 80 by 160 feet clear span and has a temperature range of +65° to -10°F. Piping capable of providing a flow of 1, 2, 4 or 8 cubic feet per second is located on one side of the room, and a large drain trough is on the other. The floor is designed for loads up to 400 pounds per square foot. Models of reaches can be constructed in this area to test ways to alleviate ice jams through channel modification. Tests of the bearing capacity of large ice sheets and cold-testing of vehicles and structures are a few of the other potential uses of this space. Tests conducted in this room will help to alleviate much of the flooding caused by ice jams.

USDA, Natural Resources Conservation Service

Contacts:

Gerald J. Lang, Technology Leader; Phone: (603) 868-7581, Fax: (603) 868-5301
E-mail: gerald.lang@nh.usda.gov

Edward Hansalik, Civil Engineer; Phone: (603) 868-7581, Fax: (603) 868-5301
E-mail: ehansalik@nh.usda.gov

Address: Federal Building
2 Madbury Road
Durham, NH 03824

Description and Mission:

The Natural Resources Conservation Service (NRCS) is a Federal agency within the US Department of Agriculture. The mission of the NRCS is to help people conserve, improve and sustain our natural resources and environment. NRCS, formerly the Soil Conservation Service, is the lead federal agency for conservation on private land. NRCS provides conservation technical assistance through local conservation districts and Resource Conservation and Development (RC&D) Councils to individuals, communities, watershed groups, tribal governments, federal, state, and local agencies, and others. NRCS has an interdisciplinary staff of professional engineers, planners, biologists, foresters, agronomists, and soil scientists working together to provide the necessary technical assistance to solve resource or environmental problems. NRCS products typically include conservation plans, study reports, engineering designs, and resource maps.

Authorities and Funding:

NRCS state and field offices derive funding from two possible sources, direct Federal appropriations and reimbursable agreements with agencies and units of government. NRCS manages several programs; Environmental Quality Incentive Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetland Reserve Program (WRP), Forestry Incentives Program (FIP), and Farmland Protection Program (FPP) which provide cost-share assistance to landowners and users (primarily agricultural or forestry land) to install conservation practices to restore and protect natural resources. NRCS can also provide technical assistance ranging from preliminary reviews to complete detail designs to landowners/users solving resource problems even if financial assistance is not being provided for the installation of conservation practices. This assistance is dependant on staff availability and priorities.

NRCS also manages the Emergency Watershed Protection (EWP) program, which can provide financial and technical assistance to units of government and groups to repair damages sustained from a natural disaster (flood, fire, hurricane, tornado) creating an imminent hazard to life and property. The restoration efforts must be environmentally and economically cost effective and typically includes clearing debris from clogged

stream channels, stabilizing eroded stream banks and restoring vegetation for stabilization purposes. NRCS can also provide technical assistance to watershed associations or groups to develop comprehensive plans for improving or protecting the watershed environment (water quality, flood reduction, wildlife habitat).

Mitigation Involvement:

The NRCS can provide technical assistance to conduct inventories, to complete watershed or site-specific plans, or to develop detail engineering and construction designs for conservation applications that will help reduce future damages from natural disasters. Some examples of past mitigation efforts include: floodplain management studies for towns, site assessments of stream flow impairments, stabilization designs to protect structures which could sustain severe damages from another storm event, and small watershed plans addressing flooding problems. Some of these products can be provided through other conservation assistance efforts. However, the major jobs would require a reimbursable agreement with the state or towns to complete the work.

Mitigation Goals and Objectives:

With respect to hazard mitigation, the goal of the NRCS in New Hampshire is to meet the needs of the State and local governments by providing timely technical assistance to support recovery and restoration efforts. NRCS can contribute this technical assistance by interacting directly with NHOEM at the state level and having our field staff working directly with Town Emergency Management officials at the local level. Short-term goals are to establish contacts with local officials and the conservation districts at the field office level to facilitate quicker response times. Intermediate and long-term objectives are to improve the cooperative efforts of working with NHOEM and establish additional contacts for providing timely technical assistance at the local level.

Projects/Planning Desired:

NRCS would like to work with local watershed associations to develop comprehensive plans addressing resource and environmental needs and opportunities in the priority watersheds as identified in the Unified Watershed Assessment. These plans can provide the basis for targeting and requesting special funding to meet the needs of the local watershed association. Technical assistance for planning and designing along with public information dissemination are the typical activities our agency can provide in this effort.

NRCS Resources with respect to Hazard Mitigation

Personnel:

NRCS in New Hampshire has a workforce of 45 staff members along with 5 multi-state staff members. Approximately 22 staff members consisting of engineers, biologists, foresters, conservation planners, and technicians are available to provide some assistance in mitigation efforts. Support staff of a GIS specialist, computer specialist, and public information specialist could assist in providing information for public outreach. This staff is available to provide limited assistance under our present program funding authorities. However, larger projects would require reimbursement for planning and design assistance.

Equipment, Physical Facilities and Other Capabilities:

All of our field offices and State office have computers and access to the internet. All of the field offices have survey equipment and all engineers have the use of CADD software. All field offices have access to small meeting rooms and access to the Federal Telecommunications System. Government vehicles are located at all field offices for use by government employees and could be made available in emergencies.

Northeast States Emergency Consortium (NESEC)

Contacts:

Edward S. Fratto, Executive Director: Phone: (781) 224-9876, Fax: (781) 224-4350
E-Mail: www.nesec.org

Kristin M. O'Brien, Assistant Executive Director: Phone: (781) 224-9876
Fax: (781) 224-4350
E-Mail: www.nesec.org

Address: Northeast States Emergency Consortium
419 Main Street, Suite 5
Wakefield, MA 01880

Organization Description:

The Northeast States Emergency Consortium, Inc. (NESEC) is a 501(c)(3) not-for-profit natural disaster mitigation and emergency management organization, located in Wakefield, Massachusetts. NESEC is the only multi-hazard consortium of its kind in the country and is supported and funded by the Federal Emergency Management Agency (FEMA). The eight Northeast States of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont form the consortium. NESEC has a full-time Executive Director, and Assistant. It is governed by a Board of Directors. The Board is comprised of the Directors of the State Emergency Management Agencies from each of the six New England States and the States of New York and New Jersey.

Organization Mission:

NESEC works in partnership with government and private organizations to reduce losses of life and property from natural disasters in the Northeast United States. The Northeast States are vulnerable to most of the natural hazards, including hurricanes, earthquakes, coastal and inland flooding, tornadoes and micro-bursts, forest fires, drought, lightning, blizzards and other forms of severe weather. Our developed urban areas and the desire to build and live on waterfront property have increased our degree of risk from natural hazards.

Mitigation Programs:

Grants: NESEC raises funds from government and private sources to support local mitigation projects. These funds are awarded on a competitive basis in the form of grants in the range of \$500-5,000. The name of this program is called the *Power of Prevention*. This program was funded at about \$50,000 in 1998 and \$35,000 in 1997. NESEC is pursuing 1999 funding. The program is presently unfunded. All grant programs are administered in cooperation with the New Hampshire Office of Emergency Management (NHOEM). Communities interested in participating should contact NHOEM.

HAZUS: NESEC assists FEMA PROJECT IMPACT Communities in the use of HAZUS as a planning platform for incorporating multi-hazard disaster prevention initiatives. NESEC can produce a HAZUS report using default data for each of the initial PROJECT IMPACT Communities. Priority is given to PROJECT IMPACT communities, however assistance may be provide to other communities as resources allow. This report provides an excellent starting point for communities wishing to utilize HAZUS to identify potential hazards. The NESEC HAZUS Report is multi-hazard and usually contains information on earthquakes, tornadoes, flood and wind.

There is no fee or charge for producing the default HAZUS Report and meeting with the community to discuss the results. All HAZUS support is arranged in cooperation with the New Hampshire Office of Emergency Management (NHOEM). Communities interested in participating should contact NHOEM.

Emergency Generators: NESEC assists communities to establish a partnership with their electric utilities and service companies. The partnership would conduct an energy efficiency audit of the community, recommend cost saving measures, and implement a cost saving plan. Monthly savings could be used to fund emergency generator(s) for local critical facilities. The utility or energy service company could then lease, install, and maintain generator(s) in a community.

The community would pay a monthly charge for the lease agreement. This charge would not exceed the savings derived through energy efficiency measures, so there would be no capital outlay or additional cost to the community. In fact, some communities may be able to reduce their monthly electric bills in an amount that exceeds the cost of the generator(s) lease agreement.

Monthly savings and utility participation will vary from state to state and community-to-community depending on present electric power usage and efficiency measures and deregulation. There is no fee or charge for assisting communities in establishing partnerships with electric utilities. NESEC assistance will be provided as resources allow. All emergency generator support is arranged in cooperation with the New Hampshire Office of Emergency Management (NHOEM). Communities interested in participating should contact NHOEM.

Hazard Mitigation Resource Profile

Federal Mitigation Grant Programs

I. Pre-Disaster Mitigation Grant Program

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event.

Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.

<http://www.fema.gov/government/grant/pdm/index.shtm>

II. Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

<http://www.fema.gov/government/grant/hmgp/index.shtm>

III. Flood Mitigation Assistance (FMA) Program

The FMA program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the [National Flood Insurance Program](#) (NFIP).

FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program.

<http://www.fema.gov/government/grant/fma/index.shtm>

IV. Repetitive Flood Claims Program

The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al).

Up to \$10 million is available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more

claims to the National Flood Insurance Program (NFIP).
www.fema.gov/government/grant/rfc/index.shtm

V. **Severe Repetitive Loss Program**

The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the [National Flood Insurance Program](#) (NFIP).

The definition of severe repetitive loss as applied to this program was established in Section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a. An SRL property is defined as a **residential property** that is covered under an NFIP flood insurance policy and:

- (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten year period, and must be greater than 10 days apart.
<http://www.fema.gov/government/grant/srl/index.shtm>



FEMA

Program Information

Mitigation

The Unified Hazard Mitigation Assistance Grant Programs



Hazard Mitigation Assistance

The Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) programs present a critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds.

A Common Goal

While the statutory origins of the programs differ, all share the common goal of reducing the risk of loss of life and property due to natural hazards.

Funding Disaster Recovery Efforts

The Hazard Mitigation Grant Program (HMGP) may provide funds to States, Territories, Indian Tribal governments, local governments, and eligible private non-profits following a Presidential major disaster declaration.

The Hazard Mitigation Grant Program (HMGP)

is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the State requested by the Governor. The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration.

The Pre-Disaster Mitigation (PDM)

program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Indian Tribal governments, and local communities in implementing a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future disasters.

The Flood Mitigation Assistance (FMA)

program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

The Repetitive Flood Claims (RFC)

program is authorized by Section 1323 of the NFIA, 42 U.S.C. 4030, with the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time.

The Severe Repetitive Loss (SRL)

program is authorized by Section 1361A of the NFIA, 42 U.S.C. 4102a, with the goal of reducing flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest amount of savings to the NFIF in the shortest period of time.

Additional HMA resources, including the HMA Unified Guidance, may be accessed at www.fema.gov/government/grant/hma/index.shtml

Program Comparisons

Cost Sharing

In general, HMA funds may be used to pay up to 75 percent of the eligible activity costs. The remaining 25 percent of eligible costs are derived from non-Federal sources.

The table below outlines the Federal and State cost share requirements.

COST SHARE REQUIREMENTS

Programs	Mitigation Activity Grant (Percent of Federal/ Non-Federal Share)
HMGP	75/25
PDM	75/25
PDM (subgrantee is small impoverished community)	90/10
PDM (Tribal grantee is small impoverished community)	90/10
FMA	75/25
FMA (severe repetitive loss property with Repetitive Loss Strategy)	90/10
RFC	100/0
SRL	75/25
SRL (with Repetitive Loss Strategy)	90/10

Eligible Applicants and Subapplicants

States, Territories, and Indian Tribal governments are eligible HMA Applicants. Each State, Territory, and Indian Tribal government shall designate one agency to serve as the Applicant for each HMA program. All interested subapplicants must apply to the Applicant.

The table below identifies, in general, eligible subapplicants.

ELIGIBLE SUBAPPLICANTS

Subapplicants	HMGP	PDM	FMA	RFC	SRL
State agencies	✓	✓	✓	✓	✓
Indian Tribal governments	✓	✓	✓	✓	✓
Local governments/communities	✓	✓	✓	✓	✓
Private non-profit organizations (PNPs)	✓				

✓ = Subapplicant is eligible for program funding

Individuals and businesses are not eligible to apply for HMA funds, however, an eligible subapplicant may apply for funding to mitigate private structures. RFC funds are only available to subapplicants who cannot meet the cost share requirements of the FMA program.

Available Funding

PDM, FMA, RFC, and SRL are subject to the availability of appropriations funding, as well as any directive or restriction made with respect to such funds.

HMGP funding depends on Federal assistance provided for disaster recovery.

General Requirements

All mitigation projects must be cost-effective, be both engineering and technically feasible, and meet Environmental Planning and Historic Preservation requirements in accordance with HMA Unified Guidance. In addition, all mitigation activities must adhere to all relevant statutes, regulations, and requirements including other applicable Federal, State, Indian Tribal, and local laws, implementing regulations, and Executive Orders.

All Applicants and subapplicants must have hazard mitigation plans that meet the requirements of 44 CFR Part 201.

Eligible Activities

The table below summarizes eligible activities that may be funded by HMA programs. Detailed descriptions of these activities can be found in the HMA Unified Guidance.

ELIGIBLE ACTIVITIES

Mitigation Activities	HMGP	PDM	FMA	RFC	SRL
1. Mitigation Projects	✓	✓	✓	✓	✓
Property Acquisition and Structure Demolition or Relocation	✓	✓	✓	✓	✓
Structure Elevation	✓	✓	✓	✓	✓
Mitigation Reconstruction					✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓	✓	✓
Dry Floodproofing of Non-Residential Structures	✓	✓	✓	✓	
Minor Localized Flood Reduction Projects	✓	✓	✓	✓	✓
Structural Retrofitting of Existing Buildings	✓	✓			
Non-Structural Retrofitting of Existing Buildings and Facilities	✓	✓			
Safe Room Construction	✓	✓			
Infrastructure Retrofit	✓	✓			
Soil Stabilization	✓	✓			
Wildfire Mitigation	✓	✓			
Post-Disaster Code Enforcement	✓				
5% Initiative Projects	✓				
2. Hazard Mitigation Planning	✓	✓	✓		
3. Management Costs	✓	✓	✓	✓	✓

✓ = Mitigation activity is eligible for program funding.

Management Costs

For HMGP only: The Grantee may request up to 4.89 percent of the HMGP allocation for management costs. The Grantee is responsible for determining the amount, if any, of funds that will be passed through to the subgrantee(s) for their management costs.

Applicants for PDM, FMA, RFC, or SRL may apply for a maximum of 10 percent of the total funds requested in their grant application budget (Federal and non-Federal shares) for management costs to support the project and planning subapplications included as part of their grant application.

Subapplicants for PDM, FMA, RFC, or SRL may apply for a maximum of 5 percent of the total funds requested in a subapplication for management costs.

National Flood Insurance Program (NFIP) Participation

There are a number of ways that HMA eligibility is related to the NFIP:



SUBAPPLICANT ELIGIBILITY: All subapplicants for FMA, RFC, or SRL must currently be participating in the NFIP, and not withdrawn or suspended, to be eligible to apply for grant funds. Certain non-participating political subdivisions (i.e., regional flood control districts or county governments) may apply and act as subgrantee on behalf of the NFIP-participating community in areas where the political subdivision provides zoning and building code enforcement or planning and community development professional services for that community.

PROJECT ELIGIBILITY: HMGP and PDM mitigation project subapplications for projects sited within a Special Flood Hazard Area (SFHA) are eligible only if the jurisdiction in which the project is located is participating in the NFIP. There is no NFIP participation requirement for HMGP and PDM project subapplications located outside of the SFHA.

PROPERTY ELIGIBILITY: Properties included in a project subapplication for FMA, RFC, and SRL funding must be NFIP-insured at the time of the application submittal. Flood insurance must be maintained at least through completion of the mitigation activity.

Application Process

Applications for HMGP are processed through the National Emergency Management Information System (NEMIS). Applicants use the Application Development Module of NEMIS, which enables each Applicant to create project applications and submit them to the appropriate FEMA Region in digital format for the relevant disaster.

Applications for PDM, FMA, RFC, and SRL are processed through a web-based, electronic grants management system (eGrants), which encompasses the entire grant application process. The eGrants system allows Applicants and subapplicants to apply for and manage their mitigation grant application processes electronically. Applicants and subapplicants can access eGrants at <https://portal.fema.gov>.

Application Deadline

The PDM, FMA, RFC, and SRL application period is from early June through early December. Applicants must submit a grant application to FEMA through the eGrants system. The HMGP application deadline is 12 months after the disaster declaration date and is not part of the annual application period. Details can be found in the HMA Unified Guidance.

FEMA Review and Selection

All subapplications will be reviewed for eligibility and completeness, cost-effectiveness, engineering feasibility and effectiveness, and for Environmental Planning and Historical Preservation compliance. Subapplications that do not pass these reviews will not be considered for funding. FEMA will notify Applicants of the status of their subapplications and will work with Applicants on subapplications identified for further review.



Details about the HMA Grant Application process can be found in the Hazard Mitigation Assistance Unified Guidance, which is available at www.fema.gov/government/grant/hma/Index.shtm



GovDelivery Notifications

Stay up-to-date on the HMA Grant Programs by subscribing to GovDelivery notifications. Have updates delivered to an e-mail address or mobile device. To learn more, visit www.fema.gov

Contact Information

HMA Helpline: Tel 866-222-3580, or e-mail hmagrantshelpline@dhs.gov

Contact Information for FEMA Regional Offices is provided at www.fema.gov/about/contact/regions.shtm

Contact Information for each State Hazard Mitigation Officer (SHMO) is provided at www.fema.gov/about/contact/shmo.shtm



Appendix E: Documentation of the Planning Process

*The agendas for all meetings are shown on the following pages.
The committee posted the agendas the Town Offices and Town website prior to each meeting.*

Marlow Hazard Mitigation Plan Update

Meeting #1

AGENDA

May 4, 2012

6:00 p.m.

Marlow Town Offices

167 NH Rte 123

Marlow, NH 03456

1. **Introduction**
2. **Identify Past and Potential Hazards**
 - 1) Go through each hazard type and update assessed value amount and other information on the chart provided in Chapter III of existing plan (*in meeting packet*)
 - a. Add any new hazards that have occurred since the existing plan was adopted
 - b. Add any “potential hazard” concerns
3. **Land Use and Development Trends**
 - 1) Identify areas where growth is currently happening and areas with potential for future development- review of pages 11-12 from existing plan (*in meeting packet*)
4. **Risk Assessment**
 - 1) Rank each hazard according to Human Impact, Property Impact, Business Impact, Probability, Severity, and Risk using Risk Assessment Chart
5. **Review of Existing Mitigation Strategies**
 - 1) Review Chapter VII from existing plan (*in meeting packet*) and update as needed
 - 2) Identifying Gaps in Coverage
6. **Mitigation Strategy Update**
 - 1) Read State’s Hazard Mitigation Goals (2007)
 - a. Check for concurrence among team members
 - 2) Review existing “Mitigation Actions” to determine existing status (completed, deleted, deferred.)
7. **Next meeting- May 18, 6:00 p.m.**

***Please review the pages from the existing HazMit Plan listed above prior to the meeting.**

**MARLOW HAZARD MITIGATION
MEETING # 1**

May 4, 2012

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Tony Davis	Road Agent	
Ed Thomas	Board of Selectmen	
Thomas Foote	Fire Chief	Footet21@yahoo.com
Ken Avery	Police Dept.	marlowpolice@gmail.com
Dave Smith	Emergency Mgmt Dir.	
Jacqui Fay	Executive Administrator	
Bob Allen	Board of Selectmen	rallen@t-n.com

Marlow Hazard Mitigation Plan Update

Meeting #2

AGENDA

May 18, 2012

6:00 p.m.

Marlow Town Offices

167 NH Rte 123

Marlow, NH 03456

- 1. Critical Facilities**
 - Review Chapter V: Critical Facilities (*in meeting packet*) and update as needed*
- 2. Assessing Vulnerability**
 - Review Chapter VI: Assessing Vulnerability (*in meeting packet*)*
 - Look at map to check concurrence with text- update text as needed
- 3. Review of Existing Mitigation Strategies**
 - Review Chapter VII from existing plan (*in meeting packet*) and update as needed*
 - Identify gaps in coverage
- 4. Mitigation Strategy Update**
 - Review existing “Mitigation Actions” to determine existing status
 - Determine if each action has been completed, deleted, or deferred
 - Begin work on Update to Mitigation Strategy
 - Implementation of National Flood Insurance Program (NFIP)
 - Develop List of Mitigation Actions for Update Plan
- 5. Evaluation of Proposed Actions**
 - STAPLEE chart
 - Grade/Rank the Actions according to the Established Evaluation Criteria
 - Action Plan- determine Who, When, Cost/ Benefit
- 6. Set date for next meeting**
 - Suggested date – June 15 at 6:00 p.m.

**Please review the following pages from the existing HazMit Plan and additional background material prior to the meeting.*

**MARLOW HAZARD MITIGATION
MEETING # 2**

May 18, 2012

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Thomas Fuschotto	Bd of Selectmen	Town
Ed Thomas	Bd of Selectmen	ed1255@sbcglobal.net
Tony Davis	Road Agent	Town
Thomas Foote	Fire Chief	footet@yahoo.com
Dave Smith	Em. Mgmt. Dir.	dsmith@liquidpc.com

Marlow Hazard Mitigation Plan Update

Meeting #3

AGENDA

June 15, 2012

6:00 p.m.

**Marlow Town Offices
167 NH Rte 123
Marlow, NH 03456**

- 1. Review of information gathered from Meeting # 2**
 - Continue to develop the list for potential Mitigation Actions for the Plan Update
- 2. Potential Hazard Location Mitigation Actions**
 - Determine potential hazard locations with each hazard type. Include actions to help mitigate hazards on the chart.
- 3. Prioritizing Proposed Mitigation Actions - Step 8**
 - Complete the STAPLEE Chart and assign values in each column.
- 4. Develop an Implementation Plan - Step 9**
 - Grade/Rank the actions according to the established evaluation criteria using the chart provided to answer the questions of Who, When, How, and Cost/Benefit
- 5. Set date for next meeting**
 - The next meeting will be determined by the amount of material that we complete during this meeting (meeting 3)
 - Suggested dates – July 13, 6:00 p.m. if we need to finish gathering information
 - or August 10, 6:00 p.m. to review the completed Draft Plan

**MARLOW HAZARD MITIGATION
MEETING # 3**

June 15, 2012

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Thomas Fuschetto	Board of Selectmen	
Ed Thomas	Board of Selectmen	
Thomas Foote	Fire Chief	
Ken Avery	Police Dept.	
Dave Smith	Emergency Mgmt Dir.	

Marlow Hazard Mitigation Plan Update

Meeting #4

AGENDA

September 7, 2012
6:00 p.m.

Marlow Town Offices
167 NH Rte 123
Marlow, NH 03456

1. **Location Specific Programs/Activities Chart**
 - Update the chart (pages 31-33 of the existing plan)
2. **Complete Unfinished Sections of the Plan**
 - Status of Previous Mitigation Actions- fill in the blank spaces (pages 33-34 of updated plan)
 - Mitigation Action Plan- add cost estimates to highlighted areas (page 39 of updated plan)
3. **Review of Draft Plan**
 - Review each page of the draft plan for accuracy
4. **Next Steps**

**MARLOW HAZARD MITIGATION
MEETING # 4**

September 7, 2012

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Thomas Fuschetto	Board of Selectmen	
Thomas Foote	Fire Chief	
Dave Smith	Emergency Mgmt Dir.	
Jacqui Fay	Executive Administrator	

DRAFT

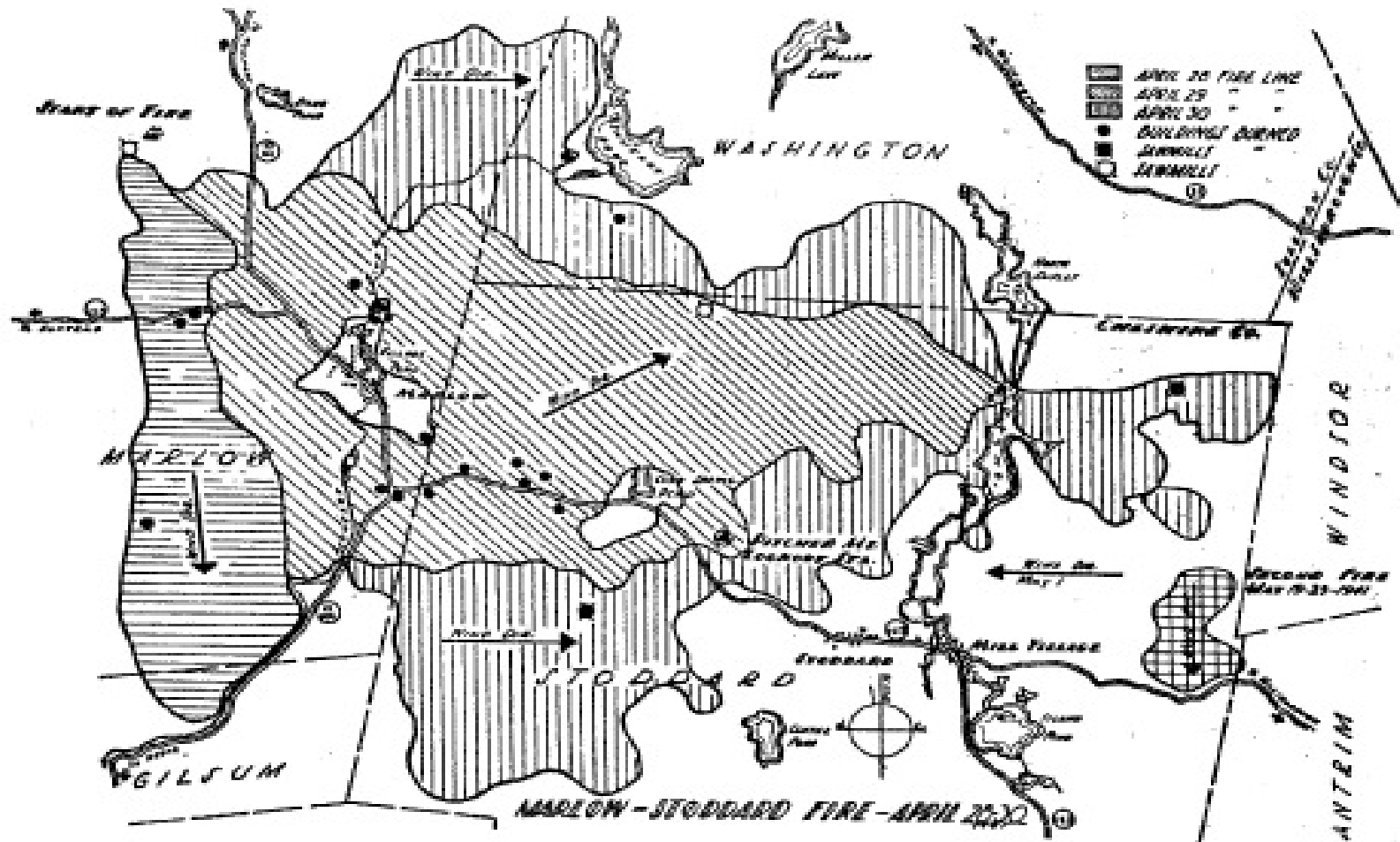
Public Notice
Town of Marlow
Hazard Mitigation Plan Review

A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from 6 – 16 November 2012 at the Marlow Town Hall during regular business hours or by going to the Town's web site www.marlownewhampshire.org.

Written comments may be addressed to the Board of Selectmen and sent to the Town Office, 167 NH RTE 123, Marlow, NH 03456 or emailed to marlowtownoffice@myfairpoint.net.

Appendix F: Wildfire of 1941 Map

DRAFT



Appendix G: Project Status, Additions, Amendments

Project additions and/or amendments should be noted in the following table. The purpose of this is to consolidate all changes to projects noted in the plan which will make easier the yearly update of the plan.

