Multi-Hazard Mitigation Plan

By
North Country Council, Inc.
Bethlehem, NH 03574

May 5, 2011
Final for Town Review

Multi-Hazard Mitigation & Community Wildfire Protection Plan
ACKNOWLEDGEMENTS

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- New Hampshire Homeland Security Emergency Management (HSEM)
- New Hampshire Department of Resource and Economic Development (Division of Forests & Lands)
- US Department of Agriculture: US Forest Service
- New Hampshire Department of Energy & Planning (OEP)
- Town of Northumberland

Town of Northumberland Multi-Hazard Mitigation Planning Team

Fifteen people have attended meetings and/or been instrumental in completing this plan:

- Rob Gauthier  Emergency Management Director
- Terrence Bedell  Fire Chief & Building Inspector
- Mario Audit  Select Board Chair (former)
- Sandy Mason  Groveton Ambulance Director
- Becky Craggy  Administrative Assistant
- Richard Brooks  Health Officer
- Michael Cloutier  Assistant Chief & Assistant Health Officer
- Marcel Platt  Police Chief
- Lee Rice, Jr.  Highway Department
- Travis Wentworth  Water & Sewer Department
- Glenn Cassady  Highway Department
- Chris O’Brien  USDA-US Forest Service
- Ashley Pushkarewicz  American Red Cross
- Heidi Lawton  Field Representative, NH Homeland Security Emergency Management
- June Garneau  GIS & Hazard Mitigation Planner, North Country Council

This Plan is an update to the Northumberland Hazard Mitigation Plan of 2005

Approval Notification Dates

- Conditional Approval: TBD
- Date of Adoption: TBD
- Letter of Final Approval: TBD
- Plan Approval Date (FEMA): TBD

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Executive Summary

The Northumberland Multi-Hazard Mitigation Plan was compiled to assist the Town of Northumberland in reducing and mitigating future losses from natural and man-made hazardous events. The Plan was developed by Mapping and Planning Solutions (MAPS) for North Country Council (NCC) along with the participants from the Town of Northumberland Multi-Hazard Mitigation Team. The Plan contains the tools necessary to identify specific hazards and aspects of existing and future mitigation efforts.

This plan addresses the following hazards:

- Severe Winter Weather
- High Winds (Windstorm)
- Flooding
- Hazardous Material Transport
- Hazardous Material Fixed Location
- Extended Power Failure
- Extreme Temperatures
- Violent Crime
- Epidemic & Pandemic
- Severe Thunderstorms & Lightning
- Wildfire
- Terrorism
- Dam Failure
- Hurricane
- Erosion, Mudslide, Landslides
- Tornados or Downbursts
- Hailstorm
- Drought

This plan also provides a list of critical infrastructure/key resources (CIKR) categorized as follows: Necessary for Emergency Response Facilities (ERF), Not Necessary for Emergency Response Facilities (NERF), Facilities/Populations to Protect (FPP), and Potential Resources (PR). In addition, this plan addresses the Town’s involvement in The National Flood Insurance Program (NFIP).

This multi-hazard plan was designed to include a detailed study and analysis of wildfire hazards. The original goal was to produce two separate plans but that concept produced excessive overlap and cost. To streamline the process, the wildfire plan was fully integrated into this multi-hazard plan. This multi-hazard plan meets the USDA-Forest Service requirement for a Community Wildfire Protection Plan (CWPP). Certain parts of this plan are dedicated to the wildfire threat.

The Planning process included reviewing other town hazard and wildfire plans, technical manuals, federal and state laws as well as research data. Combining the elements from these plans, the Team was able to produce this integrated multi-hazard plan. The Northumberland Multi-Hazard Mitigation Plan is considered a work in progress. There are three situations which will prompt revisiting this plan:

- First, as a minimum, it will be reviewed annually or after any emergency event to assess whether the existing and suggested mitigation strategies were successful. This review will focus on the assessment of the Plan’s effectiveness, accuracy and completeness in monitoring of the implementation strategy. The review will also address recommended improvements to the Plan as contained in the FEMA plan review crosswalk, and address any weaknesses the Town identified that the Plan did not adequately address.
Second, the Plan will be thoroughly **updated** every **five years**. The public will be allowed and encouraged to participate in that revision process.

Third, if the Town adopts any major modifications to its land use planning documents, the jurisdiction will conduct a plan review and make changes as applicable.

Public involvement was encouraged throughout this process and will continue to be stressed in future updates. In a pre-meeting, town officials were given a recommended list of people to invite and participate in the process. Also, a press release was disseminated which encouraged public involvement and, as part of the Memorandum of Understanding (MOU) signed by the Select Board, the requirement to seek public attendance was detailed.

Upon conditional approval, a public hearing was held prior to the Select Board’s formal adoption of the Plan. In the future, public notice will be given: **before the annual review, after a hazardous event and at the time of the five-year update.** The public notice for this Plan and for future plan reviews will be given by such means as: press releases in local papers, posting meeting information on the Town website (if available), sending letters to federal, state, and local organizations impacted by the Plan, and posting notices in public places in the Town.

Once final approval was received, copies of the Plan were distributed to the Town, HESM, FEMA, DRED and the USDA-FS; the Plan was then distributed as these entities saw fit. Copies of the Plan remain on file at the North Country Council (NCC) in both digital and paper format.

For ease of reference, the following will be denoted as:

Northumberland Multi-Hazard Mitigation Plan.............................................the Plan
Northumberland.........................................................................................the Town
The Multi-Hazard Mitigation Team..............................................................the Team
North Country Council..............................................................................NCC
North Country Council Planner.................................................................the Planner
NH Homeland Security & Emergency Management ...................................HSEM
Federal Emergency Management Administration ....................................FEMA
Community Wildfire Protection Plan ........................................................CWPP
Mapping and Planning Solutions.............................................................MAPS

**Appendix G contains a list of commonly used acronyms. Items highlighted in pale yellow (such as the box below) represent additional notations added for clarity and understanding.**

Adoption by the local governing body demonstrates the jurisdiction’s commitment to fulfilling the mitigation goals and objectives outlined in the Plan. Adoption legitimizes the Plan and authorizes responsible agencies to execute their responsibilities. The Plan shall include documentation of the resolution adopting the Plan as per requirement §201.6(c)(5).
Chapter I: Multi-Hazard Planning Process

A. Authority & Funding

Northumberland’s Multi-Hazard Mitigation Plan was prepared in accordance with the Disaster Mitigation Act of 2000 (DMA), Section 322, and Mitigation Planning, signed into law by President Clinton on October 30, 2000. The Plan was prepared by the Northumberland Multi-Hazard Mitigation Planning Team with the assistance and professional service of Mapping and Planning Solutions for North Country Council (NCC) Regional Planning Commission under contract with New Hampshire Homeland Security Emergency Management (HSEM) operating under the guidance of Section 206.405 of 44 CFR Chapter 1 (10-1-97 Edition). This plan was funded, in part, by HSEM through grants from FEMA.

B. Purpose & History of the FEMA Mitigation Planning Process

The ultimate purpose of Disaster Mitigation Act of 2000 (DMA) is to:

“…establish a national disaster hazard mitigation program -

- To reduce the loss of life and property, human suffering, economic disruption and disaster assistance costs resulting from natural disasters; and
- To provide a source of pre-disaster hazard mitigation funding that will assist States and local governments (including Indian tribes) in implementing effective hazard mitigation measures that are designed to ensure the continued functionality of critical services and facilities after a natural disaster”.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section “322 – Mitigation Planning” which states:

“As a condition of receipt of an increased Federal share for hazard mitigation measures under subsection (e), a State, local, or tribal government shall develop and submit for approval to the President a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government.”

HSEM’s goal is to have all New Hampshire communities complete a local multi-hazard plan as a means to reduce future losses from natural and man-made events before they occur. HSEM outlined a process whereby communities throughout the state may be eligible for grants and other assistance upon completion of this multi-hazard plan.

1 Disaster Mitigation Act (DMA) of 2000, Section 101, b1 & b2
2 Disaster Mitigation Act (DMA) of 2000, Section 322a
Northumberland's Multi-Hazard Mitigation Plan is a planning tool to use to reduce future losses from natural and man-made hazards as required by the Disaster Mitigation Act of 2000; this plan does not constitute a section of the Town’s Master Plan. The Multi-Hazard Mitigation planning process resulted in significant cross-talk regarding all types of natural and man-made hazards by team members.

The DMA places new emphasis on local mitigation planning. It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition to receiving Hazard Mitigation Grant Program (HMGP) project grants. Local governments must review yearly and update this plan every five years to continue program eligibility.

C. Jurisdiction

This plan addresses only one jurisdiction - the Town of Northumberland, NH.

D. Scope of the Plan & Federal & State Participation

A community’s multi-hazard mitigation plan often identifies a vast number of natural hazards and is somewhat broad in scope and outline. The scope and effects of this plan were assessed based on the impact of hazards and wildfires on: Critical Infrastructure and Key Resources (CIKR); current residential buildings; other structures within the Town; future development; administrative, technical and physical capacity of emergency response services; and response coordination between federal, state and local entities.

In seeking approval as a Multi-Hazard Mitigation Plan and a Community Wildfire Protection Plan (CWPP), the planning effort included participation of Homeland Security and Emergency Management, the US Forest Service, the Department of Resources and Economic Development (DRED), the NH Office of Energy & Planning (OEP) as well as routine notification of upcoming meetings to the state and federal entities above. Designation as a CWPP will allow a community to gain access to federal funding for hazardous fuels reduction and other mitigation projects supported by the US Forest Service. By merging the two federal planning processes (multi-hazard and wildfire), duplication is eliminated and the Town has access to a larger pool of resources for pre-disaster planning.

The Healthy Forest Restoration Act (HFRA) of 2003 includes statutory incentives for the US Forest Service to give consideration to local communities as they develop and implement forest management and hazardous fuel reduction projects. For a community to take advantage of this opportunity, it must first prepare a CWPP. This multi-hazard mitigation planning process not only satisfies FEMA’s criteria regarding wildfires and all other hazards but also addresses the minimum requirements for a CWPP:

- **Collaboration:** A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.

- **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure.
• **Treatment of Structural Ignitability:** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.  

Finally, as required under Code of Federal Regulations (CFR), Title 44, Part 201.6(c) (2) (ii) and 201.6(c) (3) (ii), the Plan must address the community’s participation in the National Flood Insurance Program (NFIP), its continued compliance with the program, and, as part of vulnerability assessment, the Plan must address the NFIP insured structures that have been repetitively damaged due to floods.

**E. Multi-Hazard Planning Process**

The planning process consisted of eleven specific steps; some steps were accomplished independently while other areas were interdependent. Many factors affected the ultimate sequence of the planning process: length of meetings, community preparation and attendance, and other community needs. All steps were included but not necessarily in the numerical sequence listed. The list of steps is as follows:

- **Step 01:** Team Formation and Orientation, Goal Identification
- **Step 02:** Formulate Hazard List, Hazard Description and Threat Matrix
- **Step 03:** Profile, List and Map Historic and Potential Hazards, both Wildfire and Natural
- **Step 04:** Profile, List and Map Critical Infrastructure and Key Resources
- **Step 05:** Assess Community’s participation in National Flood Insurance Program
- **Step 06:** Gather Town History, Past Development Trends, Future Development Trends, Town Statistics
- **Step 07:** List Existing Mitigation Strategies & Brainstorm to Identify Potential Mitigation Strategies
- **Step 08:** Evaluate and Categorize Potential Mitigation Strategies
- **Step 09:** Prioritize Mitigation Strategies to Determine Implementation Plan
- **Step 10:** Team Review of Plan Contents for Submission to HSEM/FEMA
- **Step 11:** Adopt and Monitor the Plan

**F. Involvement**

*(Public, Neighboring Communities, Agencies, Non-profits and other interested parties)*

Public involvement was stressed during the initial meeting and community officials were given a matrix of potential team members (see page 11). Community officials were urged to contact as many people as they could to participate in the planning process. A press release, stressing the public nature of the process, was also disseminated and sent to area newspapers.

Team composition is expected to be lower in smaller communities because of the small population base and the fact that many people “wear more than one hat”. While much effort was made to include public participation, few general community members took the opportunity to participate.

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3 Healthy Forest Restoration Act; HR 1904, 2003; Section 101-3-a.b.c; http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_bills&docid=f:h1904enr.txt.pdf
Press Release

North Country Council, Inc.  

Cottage at the Rocks  
07 Glessner Road  
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News Release

FOR IMMEDIATE RELEASE

September 30, 2010  
Contact: June Garneau  
603-444-6303 ext. 13

TOWN OF NORTHUMBERLAND COMMENCES MULTI-HAZARD MITIGATION PLANNING

The Town of Northumberland will be conducting a series of Multi-Hazard Mitigation Planning meetings over the next few months.

On September 30, 2010, Northumberland’s Emergency Management Director, the Select Board and other town officials met with June Garneau, GIS Planner at North Country Council to discuss the development of the Northumberland Hazard Mitigation Plan update.

North Country Council has been creating All-Hazard, Wildfire and Multi-Hazard Mitigation Plans for communities in the North Country for more than six years. As mandated by the Disaster Mitigation Act of 2000, all communities are required to complete a local hazard mitigation plan in order to qualify for FEMA funding should a natural disaster occur. The new Multi-Hazard Mitigation Plans will not only cover a variety of natural hazards but will also address the history and likelihood of wildfire disasters in the community and the risks of building in flood zones.

Northumberland’s Planning Team is currently being formed; all interested parties should contact Rob Gauthier at (603) 636-0049 if they wish to be included in the process. Through a series of public meetings, the Planning Team will establish priorities, collaborate on activities, and increase public awareness and participation to reduce the impact of hazards. Discussion will address issues such as flooding, hurricanes, drought, landslides and wildfires; the planning processes are made possible through grants from the Federal Emergency Management Administration (FEMA).

The next scheduled meeting of the Planning Team will be held on November 18, 2010 at 6:00 PM at the Northumberland Town Offices; the general public is encouraged to attend all meetings and to assist the Team with firsthand knowledge of historic hazard events. Representatives from Homeland Security, the USFS and NH Forests & Lands are expected to participate in future meetings.

Hazard mitigation planning is a preparedness tool. In an effort to reduce the costs of suppression and the incidence of potential losses, New Hampshire Homeland Security and Emergency Management has awarded North Country Council funding to assist communities in developing these plans. If you wish to have your community participate in this process please contact June Garneau at 444-6303 ext. 13.

Founded in 1973, North Country Council is a non-profit regional planning commission serving 51 communities and 25 unincorporated places in the northern New Hampshire. North Country Council provides planning and economic development professional services and technical assistance to member communities made possible through numerous states, federal and private grant sources and membership dues.
G. Narrative Description of the Process and Methodology

The Plan was developed with substantial local, state and federal coordination; completion of this new multi-hazard plan required significant planning preparation. All meetings were geared to accommodate brainstorming, open discussion and an increased awareness of potential hazardous conditions in the Town.

**September 30 2010**

The first meeting of the Northumberland Multi-Hazard Mitigation Team began with introductions. In attendance were Rob Gauthier (Selectman & EMD), Mario Audit (Select Board Chair), Richard Brooks (Health Officer), Becky Craggy (Administrative Assistant), Michael Cloutier (Assistant Health Officer), Sandy Mason (Groveton Ambulance), Terrence Bedell (Fire Chief) and June Garneau (former North Country Council Planner, now Mapping and Planning Solutions).

The purpose of this initial meeting was to go over the basics of mitigation planning and to discuss the formation of a “Team” (see right). June discussed the history of the Disaster Mitigation Act (DMA) of 2000 and the mandate that each community create a local Hazard Mitigation Plan in order to receive FEMA assistance for a hazardous event. June further explained that the initial concept of including only natural hazards had grown to include man-made hazards and wildfires, and that this plan may also be designed to meet the requirements of a Community Wildfire Protection Plan (CWPP); thus the Hazard Plan has become the Multi-Hazard Mitigation Plan. Furthermore, June explained the definition of “mitigation” and the advantage of bringing the community together to create an awareness of the hazards and possible ways to lessen, diminish or eliminate the effects of hazards in the community. June provided a template/sample copy of the Northumberland “Multi-Hazard Mitigation Plan Update”.

The funding source for mitigation planning was discussed and the concept of “match money” was explained. June further explained the need to track all time spent on plan development in order to use that time as “in-kind” match to assist North Country Council in meeting the match requirement. A sign-in sheet was passed around for the attendees to sign.

Team formation was next on the agenda. June discussed the importance of building a strong team in order to expedite the process and gain pertinent and valuable information. It was recommended that long-time citizens who had a unique knowledge of the Town could be helpful as well as member(s) of the Planning Board; member(s) of the Select Board; the Police Chief; the Fire Chief; the Road Agent; the EMD and EMS personnel; fortunately, most of the recommended team members were in attendance at this meeting. June explained the likely collaboration with the USDA-Forest Service (USDA-FS), Department of Resources & Economic Development-NH Forests & Lands (DRED-NHFL) and North Country Resource Conservation and Development (NC RC&D). June agreed to contact Pat Tarpey at NC RC&D to determine when or if a Water Resource Plan had been done in Northumberland.
Future meetings were discussed, with an emphasis on team involvement. June explained that there could be as little as four two-hour meetings or as many as nine two-hour meetings depending on attendance and participation at the meetings. June also explained that she was willing to meet any day of the week, during the day or in the evening if need be.

As an account of future meeting topics, June walked the attendees through the more important aspects of the process using the plan template as a guide. The attendees were advised that the Team would be going through the eleven step process and that each step worked as a building block for the final product, the Implementation Table (Table 9.1) itself.

For homework, the attendees were asked to review the plan template and to pay particular attention to the Multi-Hazard Threat Analysis (Table 3.1) using the appendix list of hazards as a guide and to review the “Goals”. The next meeting would include listing hazards that are applicable to Northumberland and analyzing them for their potential risk. In addition, June pointed out a sample Press Release and Memorandum of Understanding (MOU) for the Town’s review and agreed to forward an accurate copy of these to the appropriate parties.

The next Team meeting was set for Thursday, November 18, 2010, 6 PM at the Northumberland Town Offices.

**Meeting 2, November 18, 2010**

Rob Gauthier, Mike Cloutier, Richard Brooks, Becky Craggy, Sandy Mason, Ashley Pushkarewicz (new member, American Red Cross), Heidi Lawton (new member, Homeland Security & Emergency Management Field Representative), and June Garneau were in attendance at this second meeting. The meeting began with introductions, a review of the last meeting and a quick review of the planning process and a review of the “homework” that had been assigned. Becky confirmed that the Press Release had been posted and June confirmed that she had received the sign MOU. June once again encouraged the Team to provide digital photos for the Plan; photos of past hazard events, scenery and/or town buildings and infrastructure were all welcome.

The next part of the meeting was spent reviewing Table 2.1, Statistics of Interest to Multi-Hazard Mitigation Planning. A handout of Table 2.1 was provided with some of the information already filled in based on data obtained from the Economic and Labor Market Information Bureau’s Community Profile, received 9/9/10. With the help of the Team, the table was completed with just the number of local wildfires in the past year or two remaining for further research.

For the rest of the meeting, Table 3.1, Multi-Hazard Threat Analysis, was discussed. Using a handout provided by June, the Team was able to closely look at the hazards that were included in the 2005 Hazard Mitigation Plan and identify which of those hazards were still considered applicable five years later. In addition, the handout indicated which hazards (all natural) were of particular concern to FEMA and additional hazards that had been included by other towns in the North Country. This brainstorming session resulted in 17 identified hazards; an 18th hazard, Violent Crime, was discussed and table until more information could be gotten from the Police Chief.

The next step in the process was to analyze each hazard for its risk severity and probability. At the conclusion of this analysis, it was determined that Severe Winter Weather followed by High Winds and Flooding had potentially the greatest likelihood of occurring and having an impact on the Town (see Table 3.2, Multi-Hazard Threat Analysis). Lastly, the Team provided local descriptions for each hazard to be use in Chapter V of the Plan. It was
agreed that Table 3.1 would be reviewed at the next meeting and the Police Chief would be contacted to address Violent Crime.

Working very efficiently and with time remaining, the Team was able to begin the Critical Infrastructure and Key Resource (CIKR, Tables 4.1-4.4) discussion before closing the meeting. Several Emergency Response Facilities (ERFs) were identified however, the rest of the CIKR were tabled until the next meeting.

Although no significant homework was assigned, June asked that the Team members began thinking about CIKR and any past hazardous events and potentially dangerous areas in Town. The next meeting was set for December but later postponed due to weather and scheduling conflicts. Through email and phone correspondence, the next meeting was ultimately scheduled for January 20, 2011.

**Meeting 3, January 20, 2011**

Attendance included Rob Gauthier, Mike Cloutier, Becky Craggy, Sandy Mason, Heidi Lawton and June Garneau were in attendance at this second meeting.

The meeting began with a review of the last meeting including Tables 3.1 and 2.1. June provided handouts for both of these tables and asked the Team to look them over before the next meeting for any errors, additions or omissions. June also reminded Terry that an accounting of recent wildfires (2009 or 2010) was still needed for Table 2.1.

The next item on the Agenda was to complete the CIKR. The Team first looked at the Emergency Response Facilities list they had begun at the last meeting. Several new resources/facilities were added including several helicopter landing zones, bridges along the evacuation route, emergency transportation and critical public utilities. This brainstorming session resulted in the creation of all four CIKR tables and excellent communication regarding the importance of these facilities in Town. It was noted that things have changed significantly since the Wausau Paper Mill closed on December 31, 2007 and subsequently since the 2005 Plan was created.

The next discussion was about future and past development trends. The Town has suffered a good deal of hardship since the Mill closing in 2007 and although there are some plans for the use of the Mill site and the building of a new biomass energy facility has been approved, residents of Northumberland still struggle with the effects of high unemployment in the area and the national recession. June agreed to review the 2005 plan to gather more information about the history of the Town and development trends that existed before 2005 to include in Chapter II.

June then led a brief wildfire discussion and using GIS, displayed the Wildland Urban Interface (WUI) and the Base Risk Analysis maps. Once again, June explained the potential benefits of including wildfire strategies and collaboration with the USDA-FS and NH Forests & Lands as a means to make this plan a Community Wildfire Protection Plan as well as a Hazard Mitigation Plan. June stated that she will invite both the Forest Service and NH Forests & Lands to the next meeting.

It was explained that the WUI is the area where structures and other human development meet or intermingle with wildland, forest land or vegetative fuels. Fires within this interface pose great challenges to the fire service;
Firefighting tactics for wildfires differ considerably from those in structural fires. Access to remote areas and the availability of water sources are often limited in the WUI; therefore fire prevention programs in these areas are extremely important. It was noted that homeowners should accept a measure of responsibility and be fully aware of the risks when deciding to locate in these areas, and communities need to be aware of the preparation necessary for building in these areas.

The historical development of a WUI definition within the region was also discussed stressing FEMA’s funding criteria regarding Class I-V roads. It was carefully explained that the Team could redefine the WUI within the context of what met the local needs of the community, but if the Team's definition included Class VI or private roads, the Town needed to develop a process to notify people in those areas that FEMA pre- and post-mitigation funds would not be available for projects in those areas.

June explained the basic elements of the Base Risk GIS analysis: fuel load, slope, and aspect. Each area of the Town was then coded as low (green), medium (yellow), or high (red) risk. The Base Risk is further explained in Chapter III, Section B and reflected in Map 1, Base Risk Analysis.

Much progress was made during this meeting; Team cooperation and discussion in Northumberland is excellent and has resulted in keeping the meetings right on track. Before closing the meeting, June asked the Team to review the handouts that had been given out and to once again think about past hazardous events and potentially hazardous areas in Town. The next meeting was set for Thursday, February 17, 2011.

Meeting 4, February 17, 2011
Meeting four was excellent and was very well attended. Attendance included Rob Gauthier, Mike Cloutier, Sandy Mason, Richard Brooks, Marcel Platt (new member, Police Chief), Lee Rice, Jr. (new member, Highway Department), Travis Wentworth (new member Water & Sewer Department), Glenn Cassady (new member, Highway Department), Chris O’Brien (new member, USDA-FS) and June Garneau.

The meeting began with a recap of the last meeting. Referring to handouts that had been previously handed out, the Team further discussed Table 2.1 and Table 3.1. It was determined that Richard Brooks and Michael Cloutier would get back to June with wildfire numbers for the past two years to complete Table 2.1. Police Chief Marcel Platt was asked to provide his input for Table 3.1, "Violent Crime"; he determined that household break-ins and other similar crimes have been on the rise in Northumberland, perhaps due to the low economy of the region. Table 3.1 was updated to reflect the Chief’s assessment.

With Chris O’Brien in attendance and several new members, June quickly went through the wildfire portion of the Plan and explained the efforts that were taking place to meet the requirements of a Community Wildfire Protection Plan. Using GIS projection, the Wildland Urban Interface (WUI) and the Base Risk Analysis were explained to the Team. The low number of reported wildfires was also discussed as were the potential funding opportunities that may be available once this Plan is approved as a CWPP by DRED (NH Forests & Lands). June then provided the Team with a draft copy of the Critical Facilities and Key Resources (CIKR) that were determined at the last meeting. With the help of the Team and GIS projection, any CIKR that June was unable to map prior to the meeting were added to the map. In addition, a few minor changes were made to the list including

<table>
<thead>
<tr>
<th>Bartlett</th>
<th>Campton</th>
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<tbody>
<tr>
<td>Chatham</td>
<td>Conway</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Lincoln</td>
</tr>
<tr>
<td>Madison</td>
<td>Plymouth</td>
</tr>
<tr>
<td>Randolph</td>
<td>Rumney</td>
</tr>
<tr>
<td></td>
<td>Woodstock</td>
</tr>
</tbody>
</table>
the addition of a new biodiesel plant to be built in Northumberland. There was some discussion about which CIKR category this should go into, but after considering this overnight, June decided that it should be categorized as an Emergency Response Facility (ERF). The reasoning behind this decision is that although a biodiesel plant is not critical to an emergency response, if it were to be effected by a hazard, it could itself become a second hazard.

The next step was to look at past hazards and potentially hazardous areas in the community. Using the information contained in the 2005 All Hazard Plan, the Team was able to determine the validity of previously listed hazards and to add new hazards for this Plan. Once the list was complete, it was decided to wait until either the next meeting or a smaller meeting with one or two Team members to do the mapping of the hazards. June agreed to do the best she could in GIS to get as many complete as possible before meeting again.

Table 6.1, Existing Mitigation Strategies was next on the agenda. Once again, the Team reviewed the existing strategies from the 2005 Plan and added several more for this Plan. Some items were left incomplete but with the help of Becky Craggy by phone, the Team was confident that the rest of the information would be readily available.

Lastly, the Team addressed the mitigation strategies that were outlined in the 2005 Plan to determine their effectiveness and their current status: completed, deleted or deferred. It was decided that although some of the old strategies had been completed, several would be deferred to the Implementation Table (Table 9.1) of this Plan.

To close the meeting, June explained “homework” for the next meeting and agreed to forward several documents that could help the Team begin to think about new strategies for the Implementation Table. New strategies will be based on many factors including:

- A review of Table 3.1, Multi-Hazard Threat Matrix (possible mitigation strategies for each hazard)
- A review of Table 3.2, Historic Hazard Identification (possible mitigation strategies to mitigate losses for the hazards that have occurred in the past or that may occur in the future)
- A review of Tables 4.1-4.4, Critical Infrastructure & Key Resources (possible mitigation strategies to protect CIKR)
- A review of Table 6.1, Existing Mitigation Strategies (possible mitigation strategies to improve existing strategies)
- A review of Table 7.1, Accomplishments since Prior Plan (items deferred from the 2005 Plan)

The next meeting was set for Thursday, March 24, 2011, 6PM at the Town Office.

**Meeting 5, March 24, 2011**
Meeting five was attended by Richard Brooks, Rob Gauthier, Becky Craggy, Sandy Mason, Michael Cloutier, Marcel Platt, Heidi Lawton and June Garneau. The meeting began with a review or the work from the last meeting including the CIKR (Tables 4.1-4.4), the Existing Mitigation Strategies (Table 6.1) and the strategies that had been identified in the 2005 Hazard Mitigation Plan (Table 7.1). Then the Team provided June with a list of past and future hazards or hazardous areas within the Town. Using the 2005 plan as a base, the Team added several new hazards to the list to compile the Hazard Identification table, Table 3.2. It was determined that the mapping of these hazards would be done at the next meeting.
Next, looking back through the completed portions of the Plan (Tables 3.1, 3.2, 4.1-4.4, 6.1, and 7.1), the Team identified those strategies that would be included in the Implementation Table, Table 9.1. When completed, 32 potential mitigation strategies were identified with several deferred from the 2005 plan and several noted as existing strategies that needed improvement.

Once this was complete, the Team went through the STAPLEE process, identifying for each strategy its: Social impact, Technical feasibility, Administrative capabilities, Political impact, Economic impact and Environmental impact. (See Chapter VIII for a full explanation of the process)

The meeting was adjourned and the next was set for April 21; this was later rescheduled to April 28 due to scheduling conflicts.

**Meeting 6, April 28, 2011**

In attendance were Rob Gauthier, Richard Brooks, Becky Craggy, Sandy Mason and June Garneau. The meeting began with discussion about the current flooding situation along the Connecticut River. Both June and Richard had taken photos before coming to the meeting and they were projected for the Team to see. The photos showed the closures of Perras Road, Old Village Road and the extreme flooding at Riverside Speedway. Several of these photos can be seen later in this plan.

The Team reviewed the work that was done on March 24, including a review of Tables 8.1 and 9.1. June had a few remaining loose ends to clear up including questions for Tables 6.1 and 2.1 and other miscellaneous details. Once this was complete, June provided a “handout” listing the current mitigation strategies for Table 9.1 that had been worked on previously; these were in order by date and included their STAPLEE numbers for reference.

Looking at each strategy one-by-one, the Team reviewed the details, deleted three unneeded strategies and categorized them according to timeframe and their STAPLEE numbers. They were categorized as follows:

- 1 - will take place within the year and/or has a good STAPLEE number
- 2 - will take place within 12-24 months and/or has at least a fair STAPLEE number
- 3 - will take place within 24 months and further and/or has a poor STAPLEE number

Then, the Team ranked each strategy according to its importance within the numerical categories above. At the end of the exercise, Tables 8.1 and 9.1 were complete.

Lastly, mapping of the historic hazards and wildfires and potentially hazardous areas was completed. It was decided that no additional meetings would be required and June promised to get the Plan to the Town for review as soon as possible.

June thanked the Team for their hard work and congratulated them on a job well done.
Meeting Agendas

Meeting 1 – September 30, 2010

1) Introduction
2) Evolution of Multi-Hazard Plans
   a) All Hazard...Wildfire ...Multi-Hazard
   b) Sample Plans
3) Reason for Hazard Mitigation
   a) Community involvement to educate emergency responders and citizens of Northumberland about the dangers of hazards
   b) Devise a plan that: lessens, diminishes or completely eliminates the threat of Hazards to the Town of Northumberland
   c) The Goals
4) The Process
   a) Funding
   b) Review of 11 Step Process
   c) Meetings
   d) Community Involvement - Public Notice/Press Release
   e) Signing In, Tracking Time, Agendas, Narrative
5) The Team
   a) Collaboration with other Agencies
   b) Individual citizens who can add anecdotal information
   c) Review Potential Team Member List
6) The Memorandum of Understanding
   a) To outline responsibilities
   b) Clear understanding of expectations
7) Upcoming Meeting Topics – Using 2005 Plan as a comparison & review
   a) Town Information
   b) Hazard Identification & Analysis
   c) Status of Existing Plans & Associations in Town
   d) Historic hazard identification. The Wildland Urban Interface (WUI) & Fire Base Risk Analysis
   e) The Critical Infrastructure and Key Resources (CIKR)
   f) Mapping of the WUI, wildfires, CIKR, past and potential hazardous areas
   g) Existing Mitigation Strategies
   h) Potential mitigation strategies for this jurisdiction and feasibility
   i) The Implementation Plan and priorities
8) Next Meeting
   a) Homework
      i) The Goals; please review (page 43)
      ii) The Press Release (page 10 and handout)
      iii) The Potential Team Member List; please review for ideas (page 11)
      iv) The MOU Town Manager (sample, page 54)
      v) Information about the Town, Table 2.1, please review and fill in for next meeting (page 22)
      vi) List of Hazards; start thinking of potential hazards in Northumberland; use Appendix B, page 63 as a tool

Meeting 2 – November 18, 2010; 6 PM

1) Introductions as needed
2) Quick review of last meeting for new Team members
   a) Evolution of Multi-Hazard Mitigation Plans
   b) The Goals
   c) Reason for these meetings
      i) Community involvement to educate not only emergency responders but also citizens of Monroe about the dangers of hazards in Town
      ii) Devise a plan that: lessens, diminishes or completely eliminates the threat of Hazards to the Town
   d) The Process
      i) Funding
      ii) Eleven Steps
      iii) Public Notice
      iv) Signing In, Tracking Time, Agendas, Narrative
      v) Photos – contributions welcome
   e) The Meetings
3) Town Information (Table 2.1)
   a) Review of Employment and Labor Market Information (EMLI)
   b) Any other town information as appropriate
   c) Future & Past development trends
4) The Hazards
   a) Identify possible hazards in the Town
   b) Rank/Rate each hazard according to Threat Matrix
   c) Provide description of each hazard according to local impact
5) Next Meeting
   a) Topic
   b) Homework
   c) Date/Time
Meeting 3 – January 20, 2011; 6 PM

1) Review of last meeting
   a) The planning process
   b) Information about the Town, Table 2.1 (handout)
   c) Hazard identification and analysis, Table 3.1 (handout)
   d) Hazard descriptions
   e) Began work on CIKR

2) Today’s work
   a) Complete CIKR identification and mapping (Tables 4.1-4.1)
   b) Future & past development Trends (Chapter II)
   c) Discuss the WUI and Base Risk Analysis
   d) Discuss past hazards and wildfires (Table 3.2)
   e) Look at existing mitigation strategies (Table 6.1)

3) Next Meeting
   a) Topic
   b) Homework
   c) Date/Time

Meeting 4, February 17, 2011

1) Review
   a) Homework
      i) Table 2.1: questions/concerns?
      ii) Table 3.1: questions/concerns?
   b) Last meeting
      i) Future & past development Trends (Chapter II)
      ii) Discuss the WUI and Base Risk Analysis
      iii) Note about Rangers

2) Today’s work
   a) CIKR
      i) Review completed CIKR-Tables 4.1-4.4 (handout)
      ii) Mapping to be completed
   b) Discuss past hazards and wildfires Table 3.2
      i) Look at past hazard information from 2005 Plan (pages III-1 to III-4)
      ii) Add any new hazardous areas, wildfires and/or events
   c) Existing Mitigation Strategies Table 6.1
      i) Look at strategies from 2005 Plan (page VI-2)
      ii) Add any new strategies currently in place
   d) Strategy status from last Plan – Table 7.1
      i) Look at Implementation Strategies from 2005 (page VII-3)

3) Next Meeting
   a) Implementation Strategies & Ranking (See Chapters VIII & IX, sample new plan)
      i) Homework
      (1) Begin thinking about Implementation Strategies and the STAPLEE Process and jot them down on provided “blank” handout (pages 45-49 in original plan handed out)
      Handouts to be used for Homework – Don’t forget to track your time!

   b) Next meeting: March 24, 2011, 6 PM

Meeting 5, March 24, 2011

1) Review
   a) Last meeting
      i) Reviewed & mapped CIKR-Tables 4.1-4.4
      ii) Discussed the WUI and Base Risk Analysis
      iii) Discussed past hazards and wildfires Table 3.2
      iv) Worked on Existing Mitigation Strategies Table 6.1
      v) Reviewed Implementation Strategies from 2005 for level of completion

2) Today’s work
   a) Revisit Existing Mitigation Strategies Table 6.1

3) Assign Homework
4) Schedule next meeting

Meeting 6, April 28, 2011

1) Review
   a) Last meeting’s work
      i) Completed Table 9.1 & 8.1 (STAPLEE)

2) Today’s work
   a) Revisit Existing Mitigation Strategies Table 6.1 (homework)
   b) Review Community Profile
   c) Go through Plan and tie up loose ends
   d) Map Past/Potential Hazards & Wildfires (perhaps after meeting with Rob and others)
   e) Review Mitigation Strategies completed
      i) Rank Mitigation Strategies
      ii) Prioritize Mitigation Strategies

3) Explain process going forward
4) Schedule next meeting if needed
Chapter II: Community Profile

A. Introduction
The Town of Northumberland, New Hampshire is located in Coos County in the Great North Woods region of the State. Northumberland is bordered by the towns of Stratford to the north, Stark to the east and Lancaster to the south. The western border of the Town is the Connecticut River.

B. History & Past Development Trends
On October 20, 1761, a wilderness territory was granted to John Hogg and others under the name of Stonington by Governor Benning Wentworth. It was not until mid-1767 that the area received its first permanent settlers. For those early inhabitants, Stonington was later described as being “free from stone and gravel, and is easily cultivated. A large portion of the upland is good for pasturing and tillage. The Connecticut River washes the western border and it is watered by the Upper Ammonoosuc River which passes through the Town in a southwesterly direction. Near the center of town is an abrupt and rugged elevation called Cape Horn. The scenery around the mountain is wild and picturesque.” Among the first settlers were the families of Thomas Burnside and Daniel Spaulding. Initially their settlements were located upon the plains of the Connecticut River. Early spring freshets covering their property and cabin floors encouraged them to move further upland.

Stonington was granted the name of Northumberland on January 25, 1771. The town was incorporated in the state in late 1779. In 1780, Northumberland held its first annual town meeting and elected the first selectmen to properly attend to town affairs.

Throughout these first 30 years of Northumberland’s growth, agriculture comprised the mainstay of the economy. The easily cultivated soils allowed several good farms to harvest corn, oats and barley. Progressively, manufacturing expanded in town, and logging and timber industries grew to employ the greatest number of workers. Changes in the Town’s populations reflected the strength of town industries. Economic growth in the nineteenth century was directly dependent upon the number of employees. In 1775, when agriculture dominated, Northumberland’s population was 57. The establishment of farms in the early 1800’s advanced the Towns’ population to 281 in 1810. By 1880, with the industrial revolution in full swing, Northumberland’s population totaled 1,063.

Incorporated: 1779

Origin: This town was first granted in 1761 as Stonington, probably due to Governor Benning Wentworth’s relationship with shipbuilding interests in Stonington, Connecticut. By 1767, only a few of the grantees had settled there. The territory was regranted by Governor John Wentworth in 1771 as Northumberland in honor of Hugh Smithson, first Duke of Northumberland. The Duke’s son, James Smithson, is remembered for leaving a legacy of more than a half million dollars for the founding of Smithsonian Institution.

Villages and Place Names: Groveton

Population, Year of the First Census Taken: 117 residents in 1790

Population Trends: Northumberland had the third largest decrease in both percent and numeric population change over 50 years. Population change totaled 339, from 2,779 in 1950 down to 2,440 in 2000. The population decreased over four of the last five decades. The 2009 Census estimate for Northumberland was 2,290 residents, which ranked 127th among New Hampshire’s incorporated cities and towns.

Population Density, 2009: 67.1 persons per square mile of land area. Northumberland contains 36.7 square miles of land area and 0.1 square miles of inland water area.

Source: Economic & Labor Market Information Bureau, Community Profile; Received 9/10/10

\(^4\) Taken from 2005 Hazard Mitigation Plan; source of information was the 1991 Northumberland Master Plan
In summary, because of the fertile and relatively rock-free land in the area, development trends began with farming. Later, industry took hold as large-scale logging took place throughout Northern New Hampshire, and this combined with the access to waterways, lead to the building of the Town's paper mill, Odell Manufacturing Company in 1897. An influx of settlers came to Northumberland to work at the “Mill” and in other wood products industries, building primarily one-family residences. The number of family-run farms began to diminish and by the late 1900's only a handful of farms remained, significantly less than there were in 1960.

D. Current Development Trends
The timber and pulp and paper mills became increasingly important with a large mill the bank of the Upper Ammonoosuc River becoming the largest employer in Northumberland. The “Mill” had been the Town’s largest employer until recently as competition and downsizing caused the “Mill” to be shut down.

The Village of Groveton, the most populated part of the Town, lies along the Upper Ammonoosuc River near the Connecticut River. Flooding from the time or early settlement has kept the fertile floodplain from being used for residential growth. There is also the small Village of Northumberland located closer to the banks of the Connecticut River. East of the flat and fertile floodplain, the land rises steeply and supports timber growth. Upland farms were developed in the Lost Nation area of Northumberland on the far eastern side of Town.

In 2005 when the last Hazard Mitigation Plan was written, there were two large mills in town, the largest being Wausau Paper and the other the Groveton Paper Board. Wausau Trucking was also an important asset to the community. Since then, with the closing of the mills, Northumberland has been struggling economically, with many residents left without work or travelling outside of the region to find employment, at times living out of town for a week at a time in order to stay employed. The foreclosure rate is very high in the community, as it is throughout all of northern Coos County.

Recreation is encouraged in town, but it is not a productive economic force as it is in other New Hampshire towns. The rivers and beautiful countryside may gradually encourage more recreation and tourism to the area. Hunting has always been important; a large store selling hunting and other outdoor equipment opened just north of Groveton Village and thrived for several years. Today the store is vacant. Although a few new homes have been built in the recent past, no new housing developments are currently underway. The citizens of Northumberland would like to see more commercial businesses in Town such as restaurants and retailers to augment new industrial growth.

Although the Town has suffered major economic setbacks, there is promise for the future and the Town’s residents are hopeful for a comeback. A new biomass facility, Prima America, which will turn waste products into energy, has been given an okay by the Select Board and when fully operating may employ two to three dozen workers. Perras Lumber located near Northumberland Village also continues to operate and Ocean State Job Lots attracts shoppers from other North Country towns. Members of the Town’s Boards feel that the Town is at a new “cross-road”; the Town is looking for a new and sustainable direction that will insure a prosperous and economically productive community.

The Town recognizes the importance of growth, but also understands the impact that hazards can have on new facilities and homes if built within hazardous areas of the community. Town officials continue to monitor any new growth and development, including new critical facilities, with regards to potentially hazardous events, particularly in the flood zone areas along the Connecticut and Upper Ammonoosuc Rivers.
### Table 2.1: Statistics of Interest to Multi-Hazard Mitigation Planning

<table>
<thead>
<tr>
<th>Town of</th>
<th>Northumberland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Person for the Town</td>
<td>Rebecca Craggy/Admin. Assist.</td>
</tr>
<tr>
<td>Town Mailing Address</td>
<td>10 Station Square, Groveton, NH 03582</td>
</tr>
<tr>
<td>Physical Address</td>
<td>Same</td>
</tr>
<tr>
<td>Telephone</td>
<td>603-636-1450</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:northumberlandaa@yahoo.com">northumberlandaa@yahoo.com</a></td>
</tr>
<tr>
<td>Fax</td>
<td>603-636-6098</td>
</tr>
<tr>
<td>EMD</td>
<td>Rob Gauthier</td>
</tr>
</tbody>
</table>

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<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Town</td>
<td>2,288</td>
<td>2,440</td>
<td>2,495</td>
<td>2,520</td>
</tr>
<tr>
<td>Coos County</td>
<td>33,055</td>
<td>33,156</td>
<td>34,879</td>
<td>35,014</td>
</tr>
</tbody>
</table>

- **Elderly Population (% over 65)**: 16%
- **Median Age**: 44.2
- **Change in Population-Summer (%)**: 0%
- **Change in Population-Winter (%)**: Slight decrease - snow birds

### Regional Coordination

- **County**: Coos
- **Regional Planning Commission**: North Country Council
- **Watershed Planning Region**: Connecticut River Watershed
- **Tourism Region**: Great North Woods

### Municipal Services & Government

- **Town Manager or Administrator**: No
- **Select Board**: Yes (Elected)
- **Planning Board**: Yes (Appointed)
- **School Board**: Yes (Elected)
- **Zoning Board of Adjustment**: Yes (Appointed)
- **Health Officer**: Yes (Appointed)
- **Master Plan**: Yes (2003)
- **Emergency Operation Plan (EOP)**: Yes (2006)
- **Zoning & Land Use Ordinances**: Yes (1959/2008)
- **Subdivision Regulations**: Yes (June 2010)
- **Capital Improvement Plan**: No
- **Building Permits Required**: Yes – Building Inspector/Fire Chief
- **Flood Ordinance**: Yes – in Zoning Regulations

### Percent of Local Assessed Valuation by Property Type (2009)

- **Residential Buildings**: 63.8%
- **Commercial Land & Buildings**: 17.0%
- **Other (including Utilities)**: 19.3%

### Emergency Services

- **Emergency Warning System(s)**: Air Horn at the Fire Station
- **Police Department**: Full-time Chief & 2 full-time
- **Police Mutual Aid**: Yes (local agreements)
- **Fire Department**: Volunteer (27)
- **Fire Mutual Aid**: Written Agreement
- **Fire Stations**: One
- **Fire Warden**: Yes (Fire Chief) & 6 Deputies
- **Town Fire Insurance Rating**: 7/9
- **Emergency Medical Services**: Volunteer (49)
- **Established EMD**: Yes
- **Nearest Hospital**: Weeks Medical Center, Lancaster, 11 miles 25 beds

### Utilities

- **Road Agent**: Yes - Full-time
- **Public Works Mutual Aid**: Yes (local agreements)
- **Water Works Director**: Yes
### Table 2.1: Statistics of Interest to Multi-Hazard Planning

<table>
<thead>
<tr>
<th><strong>Water Supply</strong></th>
<th>Groveton Water System; Lost Nation Water System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric Supplier</strong></td>
<td>PSNH</td>
</tr>
<tr>
<td><strong>Cellular Telephone Access</strong></td>
<td>Limited</td>
</tr>
<tr>
<td><strong>High Speed Internet</strong></td>
<td>Limited</td>
</tr>
<tr>
<td><strong>Telephone Company</strong></td>
<td>Fairpoint</td>
</tr>
<tr>
<td><strong>Public Access Television Station</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Pipeline(s)</strong></td>
<td>Portland Gas Pipeline</td>
</tr>
</tbody>
</table>

#### Transportation

<table>
<thead>
<tr>
<th><strong>Evacuation Routes</strong></th>
<th>Route 3 &amp; Route 110 &amp; Lost Nation Road &amp; Cumberland Street</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nearest Interstate</strong></td>
<td>I-93; Exit 41, 30 miles; I-91 St. Johns, 29 miles</td>
</tr>
<tr>
<td><strong>Railroad</strong></td>
<td>State owned line; St. Lawrence/Atlantic Rail</td>
</tr>
<tr>
<td><strong>Public Transportation</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Nearest Airport</strong></td>
<td>Mt. Washington Regional, Whitefield; Runway, 4001’ asphalt; Lights &amp; Navigation Aids</td>
</tr>
<tr>
<td><strong>Nearest Commercial Airports</strong></td>
<td>Portland International Jetport, 123 Miles</td>
</tr>
<tr>
<td></td>
<td>Manchester-Boston International, 129 miles</td>
</tr>
</tbody>
</table>

#### Housing Statistics (2009)

<table>
<thead>
<tr>
<th><strong>Total Housing Units</strong></th>
<th>1169</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single-Family Units</strong></td>
<td>771</td>
</tr>
<tr>
<td><strong>Residential Permits</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Multi-Family Units</strong></td>
<td>239</td>
</tr>
<tr>
<td><strong>Residential Permits</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Manufactured Housing Units</strong></td>
<td>159</td>
</tr>
</tbody>
</table>

#### Income (2009 Inflation Adjusted)

<table>
<thead>
<tr>
<th><strong>Per Capita Income</strong></th>
<th>$19,696</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median Household Income</strong></td>
<td>$39,250</td>
</tr>
<tr>
<td><strong>Median Earnings Male</strong></td>
<td>$33,839</td>
</tr>
<tr>
<td><strong>Median Earnings Female</strong></td>
<td>$28,705</td>
</tr>
<tr>
<td><strong>Families below the poverty level</strong></td>
<td>12.3%</td>
</tr>
</tbody>
</table>

#### Other

<table>
<thead>
<tr>
<th><strong>Web Site</strong></th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emergency Page on Web Site</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Local Newspapers</strong></td>
<td>Democrat; Colebrook Chronicle; Great Northwoods Journal</td>
</tr>
<tr>
<td><strong>911 GIS data available</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Assessed structure value 2009</strong></td>
<td>$95,536,815</td>
</tr>
<tr>
<td><strong>National Flood Insurance Program</strong></td>
<td>Yes - Since May 4, 1989</td>
</tr>
<tr>
<td>**<strong>Repetitive Losses</strong></td>
<td>Yes - 1 Building x 2; Total Cost $10,735.11</td>
</tr>
<tr>
<td>***<strong>USFS owned land (%)</strong></td>
<td>Approximately 3% (800± Acres)</td>
</tr>
<tr>
<td><strong>State owned land (%)</strong></td>
<td>Approximately 9% (2,043± Acres)</td>
</tr>
<tr>
<td><strong>Total USFS &amp; State Owned (%)</strong></td>
<td>Approximately 12% (2,843± Acres)</td>
</tr>
<tr>
<td><strong>Total Conserved Land (%)</strong></td>
<td>Approximately 16% (3,720± Acres)</td>
</tr>
</tbody>
</table>

#### Fire Statistics***

<table>
<thead>
<tr>
<th><strong>Town Wildfires (2010)</strong></th>
<th>1 Wildfire; 1 Acre Burned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coos County Fire Statistics (2010)</strong></td>
<td>8 Fires; 1 Acre Burned</td>
</tr>
<tr>
<td><strong>State Forest Fires FY (2010)</strong></td>
<td>360 Fires; 145 Acres Burned</td>
</tr>
</tbody>
</table>

*US Census, 2010

**Office of Energy & Planning

***All USFS & State percentages derived using GIS Analysis based on NH Conversation Data Shapefile

**Information derived from the NH Division of Forests and Lands Quarterly update and from the Town Report, 2010

All information found in Table 2.1, unless otherwise noted, was derived from local input or the Economic & Labor Market Information Bureau, NH Employment Security, 2010. Community Response Received 9/10/10; http://www.nh.gov/nhes/elm/htmlprofiles/Northumberland.html
Chapter III: Hazard Identification

A. Description of the Hazards

The first step in hazard mitigation is to identify hazards; the Team determined that:

The eight hazards that are most likely to affect Northumberland are:

- Severe Winter Weather
- High Winds (Windstorm)
- Flooding
- Hazardous Material Transport
- Hazardous Material Fixed Location
- Extended Power Failure
- Extreme Temperatures
- Violent Crime

The five hazards that may affect Northumberland are:

- Epidemic & Pandemic
- Severe Thunderstorms & Lightning
- Wildfire
- Terrorism
- Dam Failure

The five hazards that are less likely to affect Northumberland are:

- Hurricane
- Erosion, Mudslide, Landslides
- Tornados or Downbursts
- Hailstorm
- Drought

Table 3.1 provides estimates of the level of impact each listed hazard could have on humans, property and business and averages them to establish an index of “severity”. The estimate of “probability” for each hazard is multiplied by its severity to establish an overall “relative threat” factor. This matrix also shows the frequency of future occurrences (based on a 25-year window).

Based on this matrix, the most significant disaster threat to Northumberland is: Severe Winter Weather (particularly if combined with an extended power failure). The second most likely disaster is the risk of High Winds (Windstorm) followed by Flooding.

Appendix B includes more in-depth definitions of these hazards that have occurred or could occur in New Hampshire and/or Northumberland.
Table 3.1: Multi-Hazard Threat Analysis

<table>
<thead>
<tr>
<th>Table 3.1 - Multi-Hazard Threat Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazards that are most likely to affect the Town</td>
</tr>
<tr>
<td>Hazards that may affect the Town</td>
</tr>
<tr>
<td>Hazards that are less likely to affect the Town</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Scoring</td>
<td>Probability of death or injury</td>
<td>Physical losses and damages</td>
<td>Interruption of service</td>
<td>Likelihood of this occurring within 25 years</td>
<td>Average of Human, Property &amp; Business Impact</td>
<td>Relative Threat</td>
<td>Mitigation Strategies that apply to all hazards:</td>
</tr>
<tr>
<td>1 = Very Low</td>
<td>Columns A + B + C/3</td>
<td>Columns D x E</td>
<td>1-3; 10-17; 20; 22-23; 27-29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 = High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 = Very High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Human Impact</th>
<th>Property Impact</th>
<th>Business Impact</th>
<th>Probability</th>
<th>Severity</th>
<th>Risk Severity x Probability</th>
<th>Specific Strategy Number (See Table 8.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Winter Weather</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3.00</td>
<td>15.00</td>
<td>MH</td>
</tr>
<tr>
<td>High Winds (Windstorm)</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2.67</td>
<td>13.33</td>
<td>MH</td>
</tr>
<tr>
<td>Flooding</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2.33</td>
<td>9.33</td>
<td>5-9; 18; MH</td>
</tr>
<tr>
<td>Hazardous Material Transport</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3.00</td>
<td>9.00</td>
<td>19; 21; MH</td>
</tr>
<tr>
<td>Hazardous Material Fixed Location</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3.00</td>
<td>9.00</td>
<td>19; 21; MH</td>
</tr>
<tr>
<td>Extended Power Failure</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2.67</td>
<td>8.00</td>
<td>MH</td>
</tr>
<tr>
<td>Extreme Temperatures</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2.00</td>
<td>6.00</td>
<td>25; MH</td>
</tr>
<tr>
<td>Violent Crime</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2.00</td>
<td>6.00</td>
<td>26</td>
</tr>
<tr>
<td>Epidemic &amp; Pandemic</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>3.00</td>
<td>3.00</td>
<td>MH</td>
</tr>
<tr>
<td>Severe Thunderstorms &amp; Lightning</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1.33</td>
<td>2.67</td>
<td>MH</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1.33</td>
<td>2.67</td>
<td>4; 12; MH</td>
</tr>
<tr>
<td>Terrorism</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2.67</td>
<td>2.67</td>
<td>MH</td>
</tr>
<tr>
<td>Dam Failure</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2.00</td>
<td>2.00</td>
<td>MH</td>
</tr>
<tr>
<td>Hurricane</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1.67</td>
<td>1.67</td>
<td>MH</td>
</tr>
<tr>
<td>Erosion, Mudslide, Landslides</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1.67</td>
<td>1.67</td>
<td>24; MH</td>
</tr>
<tr>
<td>Tornados or Downbursts</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1.33</td>
<td>1.33</td>
<td>MH</td>
</tr>
<tr>
<td>Hailstorm</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1.33</td>
<td>1.33</td>
<td>MH</td>
</tr>
<tr>
<td>Drought</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.00</td>
<td>1.00</td>
<td>MH</td>
</tr>
</tbody>
</table>
B. Risk Assessment

The next step in hazard mitigation planning was to identify the location of past hazard events and, if possible, what facilities or areas were impacted. The Team used Table 3.1, Multi-Hazard Threat Analysis, to identify potential threats and prioritize their threat potential. The Team then used a base map that included the 100-year floodplain, political boundaries, water bodies, the road network and aerial photos to locate the past hazard events on the base map. This step in the Planning process serves as a stepping stone for predicting where future hazards could potentially occur. The Team identified past events in Northumberland and Coos County and listed them in Table 3.2, Historic Hazard Identification.

To assess the fire base risk, a formula based on the following criteria was used:

- **Ignitability** – Using the 2001 NH Land Cover Assessment GIS Layer - A value between 0 and 9 was assigned based on ignitability to 23 land cover categories from open water to pitch pine forest.
- **Slope** - A value of 1-10 was assigned to various gradients of slope.
- **Aspect** - A value of 0-8 was assigned to various aspects from flat to southwest facing slopes.

These criteria were combined using GIS analysis and weighted equally to determine risk levels throughout the Town. Once the analysis and mapping was complete in GIS, a matrix was created showing varying risk levels: low, medium, and high. Each risk level was assigned a color and was mapped over the Town of Northumberland (Map 1, Base Risk Analysis).

It was noted that there is approximately 800 acres of land in Northumberland that belong to the USDA-Forest Service and 2,043 acres that are State owed. The total conserved land is approximately 3,720 acres which includes both state and federal land and represents 16% of the total land in the Town.
Map 1: Base Risk Analysis

(11" x 17" maps included in appendix of hard copy plans)

Base Risk Analysis:
The Base Risk Analysis is based on three factors: Slope, Aspect and Land Cover (type of forest/trees). By combining these three datasets, each weighted equally, the analysis resulted in a summary of areas most at risk for wildfires danger, rated as High Risk, Medium Risk and Low Risk.

The Base Risk map defines the risk levels in the community. Please note, for the purpose of visualization, the risk layer is semi-transparent and overlaid over a derived hillshade layer to display elevation change.
C. National Flood Insurance Program (NFIP) Status

Northumberland has been a member of the National Flood Insurance Program (NFIP) since May 14, 1989; the Town is not noted as one of NH’s highest risk communities. The Town actively monitors the NFIP and related compliance issues and participates in offered trainings by the State of NH or FEMA that address flood hazard planning.

Using GIS analysis and currently available DFIRM (digital flood insurance rate map) data, approximately 108 structures were identified that are either partially or totally located in the FEMA 100-year flood zone. Although this is a relatively high number, there have been only two repetitive loss claims, on the same building, since 1978 for a total of $10,735.11 (no contents payment) as reported by the NH Office of Energy and Planning (OEP). This property, a 4 unit building, suffered losses in April of 1998 and again in April of 2002. OEP also reports that this property did not have flood insurance and the problem has not been mitigated as of February 2010.\(^5\)

It was explained to the Team that benefits of the NFIP also extend to structures that are not in the 100-year floodplain. The Team felt that the Town should be more proactive in explaining the National Flood Insurance Program to potential developers and current homeowners and that it was important to have current NFIP brochures on hand at the Town Offices. In addition, the Team acknowledged the need to become better educated on the NFIP and to better address NFIP monitoring and compliance activities. (See Table 8.1, Potential Mitigation Strategies & STAPLEE, #5 and other flood-related strategies)

Sample Flood Mitigation Strategies

The following sample actions are: related to continued compliance with the NFIP (§201.6(c)(3)(ii):B):

- Join the NFIP.
- Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.
- Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event.
- Address NFIP monitoring and compliance activities.
- Revise/adopt subdivision regulations, erosion control regulations, board of health regulations, etc. to improve floodplain management in the community.
- Participate in Community Rating System (CRS) or undertake activities to increase the grade level of the community’s CRS current participation.
- Prepare, distribute or make available NFIP, insurance and building codes explanatory pamphlets or booklets.
- Identify and become knowledgeable of non-compliant structures in the community.
- Identify and become knowledgeable of submit to rate structures.
- Identify cause of submit to rate structure and analyze how to prevent non-compliant structures in the future.
- Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE).
- Require use of elevation certificates.
- Enhance local officials, builders, developers, local citizens and other stakeholders’ knowledge of how to read and interpret the FIRM.
- Work with elected officials, the state and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through continuous communications, training and education.

\(^{\text{5 Data obtained from Jennifer Gilbert, CFM, Floodplain Management Coordinator, NH Office of Energy and Planning}}\)
**D. Profile of Past, Present & Potential Wildfire Events in Northumberland**

Historic fires can serve to help residents determine where future fires may occur, understand how the landscape and land use may have changed over time, and assist with determining priorities for future mitigation strategies. Based on the information available, we constructed a list of past fires in Northumberland (Table 3.2, Historic Hazard Identification) and displayed them through GIS mapping (Map 2, Historic Wildfires & the Wildland Urban Interface). Three wildfires were identified.

The Team felt that wildfire risk in Northumberland was relatively low as the forest areas primarily consist of hardwood trees. In addition, there is less recreation in Northumberland’s woods when compared to other White Mountains communities. Lastly, although in the past sparks from trains had cause significant wildfires, today’s railroads take more precautions to prevent this from happening.

**E. Probability of Future Potential Disasters**

Due to the location of rivers, heavy snow pack, geographic location, and topography, there is always a possibility of future disasters in Northumberland. **Severe Winter Storms, High Winds (Windstorms) and Flooding** were designated by the Team as the most likely to occur and to cause damage.

As a community located on the northern edge of the White Mountains of New Hampshire, **Severe Winter Storms** are common events in the community and due to the Town’s location along the Connecticut River and the steep and mountainous terrain, **Windstorms** are also common. When combined with an extended power outage resulting from either of these types of events, hardship could be felt by individual citizens as the food supply becomes depleted and water and sewerage systems fail to work. Outages during the winter months could result in frozen pipes, lack of water and lack of heat, particular concerns for the Town’s elderly and handicapped population.

**Flooding** as a result of rapid snow melt, heavy rain and general riverine flooding is also major concern for the Town. The Connecticut River forms the western boundary of Northumberland and often, usually annually, rises above flood level. In addition, the Town is located south of the Connecticut Lakes in Pittsburg, and, although not likely or predicted, should the dam that ultimately holds the water in these lakes back, Murphy Dam, breach, there could be a very serious impact on Northumberland. Also, the Upper Ammonoosuc River flows through the Town on its way to the Connecticut River; this river is also prone to riverine flooding and ice jams.

Table 3.1 and Table 3.2 provide more information on past and potential hazards in Northumberland.
Table 3.2: Historic Hazard Identification

*Note: Numbers in parentheses in Table 3.2 represent historic hazards in Northumberland which are reflected on Map 2 and Map 3.*

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Date</th>
<th>Location</th>
<th>Impact</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Past or Potential Flooding Hazards:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flooding Prior to 1970</td>
<td>1927, 1936, 1938, 1943 (2), 1953, 1955, 1959</td>
<td>Town &amp; State Wide</td>
<td>Spring and fall flooding events resulting from severe storms and/or heavy snowmelt</td>
<td>See below</td>
</tr>
<tr>
<td>Flooding 1970-1979</td>
<td>1972, 1973 (2), 1974, 1976</td>
<td>Town &amp; State Wide</td>
<td>Spring and fall flooding events resulting from severe storms and/or heavy snowmelt</td>
<td>See below</td>
</tr>
<tr>
<td>Flooding 1980-1989</td>
<td>1986, 1987 (2)</td>
<td>Town &amp; State Wide</td>
<td>Spring and fall flooding events resulting from severe storms and/or heavy snowmelt</td>
<td>See below</td>
</tr>
<tr>
<td>Flooding 1990-1999</td>
<td>1990, 1995, 1996 (2), 1998</td>
<td>Town &amp; State Wide</td>
<td>Spring and fall flooding events resulting from severe storms and/or heavy snowmelt</td>
<td>See below</td>
</tr>
<tr>
<td>Flooding 2000-2009</td>
<td>2003, 2005, 2006, 2007, 2008 (2)</td>
<td>Town &amp; State Wide</td>
<td>Spring and fall flooding events resulting from severe storms and/or heavy snowmelt</td>
<td>See below</td>
</tr>
<tr>
<td>Flooding</td>
<td>1938</td>
<td>Red Dam</td>
<td>(1) Red Dam damaged by heavy rain and high waters</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Flooding &amp; Dam Failure</td>
<td>1969</td>
<td>Groveton Paper Mill</td>
<td>(2) Nash Stream Dam broke due to heavy rains, Groveton Paper Mill inundated with water</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Flooding (hurricane)</td>
<td>1970</td>
<td>Red Dam</td>
<td>(1) Red Dam damaged by heavy rain and high waters</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Flooding</td>
<td>2001</td>
<td>Brooklyn Street</td>
<td>(3) Spring floods impact 4-5 houses on Brooklyn Street; low spot in the road blamed as major reason</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Flooding</td>
<td>2001</td>
<td>Cumberland Street</td>
<td>(4) Heavy rains took out a Beaver Dam causing road washout</td>
<td>Local</td>
</tr>
<tr>
<td>Flooding</td>
<td>2002</td>
<td>Brooklyn Street</td>
<td>(3) Spring floods impact 4-5 houses on Brooklyn Street; low spot in the road blamed as major reason</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Flooding</td>
<td>2004</td>
<td>Wausau Mill</td>
<td>(5) Heavy rains case Wausau effluent line to wash out along the Upper Ammonoosuc River</td>
<td>2005 Plan</td>
</tr>
</tbody>
</table>
### Type of Event | Date | Location | Impact | Source
--- | --- | --- | --- | ---
Flooding | Potential | Upper Ammonoosuc & Connecticut Rivers, Brooklyn Street, Red Dam, Old Village Road, Perras Road | Areas which are likely to flood during heavy rain or rapid snowmelt conditions; usually on an annual basis - refer specific locations for ID Numbers 1-8 on Map 3 | 2005 Plan
Flooding | March 1998, April 2011 & Potential | Old Village Road (lower end) | (6) Lower end of Old Village Road under water; at times, Northumberland Village's main road is underwater for approximately one mile; caused by quick snowmelt, rain, warm weather and the Connecticut River rising above flood level; roads closed and homes flooded | Local
Flooding | March 1998, April 2011 & Potential | Old Village Road (upper end) | (7) Upper end of Old Village Road under water; at times, Northumberland Village's main road is underwater for approximately one mile; caused by quick snowmelt, rain, warm weather and the Connecticut River rising above flood level; roads closed and homes flooded | Local
Flooding | March 1998, April 2011 & Potential | Northumberland Village & Perras Road | (8) Perras Road underwater; caused by rapid snowmelt, heavy rain, warm weather and the Connecticut River rising above flood level; roads closed homes/businesses flooded | Local
Flooding | Annually | Brooklyn Street | (3) Snow melt, saturated ground and spring rains; flood foot bridge and make walkways inaccessible | Local

**Past or Potential Wildfire Hazards:** New Hampshire is heavily forested and is therefore vulnerable to wildfire, particularly during periods of drought. The proximity of many populated areas to the state’s forested lands exposes these areas and their populations to the potential impact of Wildfire. Numbered locations are shown on Map 2.

- **Wildfire**
  - 1995 | Second Cliff | (1) Started from human activity, and ice damage | 2005 Plan
  - 2004 | Train trestle on the other side of underpass | (2) Sparks from train; .25 Acres | Local
  - June 2010 | Brown Road | (3) Cause unknown; burned 1 Acre | Local

**Past or Potential Tornados, Downbursts, Hurricanes, Severe Thunderstorms & Lightning, Earthquakes and High Winds (windstorms):** Tornados are spawned by thunderstorms and, occasionally by hurricanes, and may occur singularly or in multiples. A downburst is a severe localized wind blasting down from a thunderstorm. Downburst activity is very prevalent throughout the State, yet most go unrecognized unless significant damage occurs. Hurricanes develop from tropical depressions which form off the coast of Africa. New Hampshire’s exposure to direct and indirect impacts from hurricanes is real, but modest, as compared to other states in New England. Thunderstorms and Windstorms are common events in the State, sometimes causing structural damage. Major earthquakes are rare in New Hampshire, however, small earthquakes, sometimes unnoticed, have occurred throughout the State. Numbered locations are shown on Map 3.

- **Hurricanes**
  - 1938, 1944, 1954 (2), 1985, 1991, 1999 | Town & State Wide | Number 4, Number 7; Carol, Edna, Gloria, Bob, Tropical Storm Floyd | See below
<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Date</th>
<th>Location</th>
<th>Impact</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tornadoes</td>
<td>1963, 1970, 1972, 1986 (2)</td>
<td>Carroll County</td>
<td>F1 or F2 on the Fujita Scale</td>
<td>See below</td>
</tr>
<tr>
<td>Tornadoes</td>
<td>1956, 1966, 1999</td>
<td>Coos County</td>
<td>F1 on the Fujita Scale</td>
<td>See below</td>
</tr>
<tr>
<td>Tornadoes</td>
<td>1963, 1966, 1969, 1972, 1973</td>
<td>Grafton County</td>
<td>F1 or F2 on the Fujita Scale</td>
<td>See below</td>
</tr>
<tr>
<td>High Winds</td>
<td>1990/91</td>
<td>Town Wide</td>
<td>High winds created damaged buildings and utilities throughout Town</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Jun-73</td>
<td>Town Wide</td>
<td>Magnitude of 4.8 occurred near NH/Quebec border; felt in Northumberland</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1985</td>
<td>Town Wide</td>
<td>Tremors felt in homes and buildings; no substantial damage reported</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Apr-89</td>
<td>Town Wide</td>
<td>Magnitude of 4.1 occurred near Berlin; felt in Northumberland</td>
<td>2005 Plan</td>
</tr>
<tr>
<td>Downburst</td>
<td>Apr-08</td>
<td>Lost Nation</td>
<td>(9) Trees down, on houses and power lines; one death attributed to this storm</td>
<td>Local</td>
</tr>
</tbody>
</table>

**Past or Potential Severe Winter Weather Hazards:** Severe winter weather in New Hampshire may include heavy snow storms, blizzards, Nor’easters, and ice storms. Generally speaking, New Hampshire will experience at least one of these hazards during any winter season. Most New Hampshire communities are well prepared for such hazards. These hazards are not mapped.

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Date</th>
<th>Location</th>
<th>Impact</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice Storms</td>
<td>1979; 1998; 2008</td>
<td>Town &amp; State Wide</td>
<td>Ice Storms: major disruptions to power; transportation; public and private utilities</td>
<td>See below</td>
</tr>
<tr>
<td>Severe Winter Storm with Extended Power Failure</td>
<td>1998</td>
<td>Town &amp; State Wide</td>
<td>1998 storm created road blockages, downed power lines and trees; some Northumberland residents spent 5 to 6 days without power</td>
<td>2005 Plan</td>
</tr>
</tbody>
</table>

**Past or Potential Drought Hazards:** Droughts are generally not as damaging or disruptive as floods, but are more difficult to define. A drought is a natural hazard that evolves over months or even years and can last as long as several years to as short as a few months. These hazards are not mapped.

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Date</th>
<th>Location</th>
<th>Impact</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>1929-1936</td>
<td>Town &amp; State Wide</td>
<td>Regional</td>
<td>See below</td>
</tr>
<tr>
<td>Drought</td>
<td>1939-1944</td>
<td>Town &amp; State Wide</td>
<td>Most severe in southeast</td>
<td>See below</td>
</tr>
</tbody>
</table>
### Type of Event

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Date</th>
<th>Location</th>
<th>Impact</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>1947-1950</td>
<td>Town &amp; State Wide</td>
<td>Moderate</td>
<td>See below</td>
</tr>
<tr>
<td>Drought</td>
<td>1960-1969</td>
<td>Town &amp; State Wide</td>
<td>Regionally, longest recorded continuous spell of less than normal precipitation</td>
<td>See below</td>
</tr>
<tr>
<td>Drought</td>
<td>2001-2002</td>
<td>Town &amp; State Wide</td>
<td>Third worst drought on record</td>
<td>See below</td>
</tr>
</tbody>
</table>

### Other Past or Potential Hazards:

Man-made hazards and other unusual hazardous events have been noted throughout NH. Among others, one concern is the transport of hazardous material through communities by rail and tractor-trailer. Numbered hazards are located on Map 3. Hazards are not mapped if they cover a jurisdiction or state wide area. Numbered locations are shown on Map 3.

| Hazardous Material-Transport | 1987 | Overpass on Route 110 (10) | Train derailed carry chlorine; landed in middle of 110 and completely blocked road; chlorine residue left in air | Local |

Although the Team did not identify specific examples of past occurrences of these hazards, it was felt worthwhile to list them as potential hazards to the Town. See Multi-Hazard Threat Matrix (Table 3.1) and Chapter V for more details on these hazards.

*Historic hazard events were derived from the following sources:

- FEMA Disaster Information: [https://www.fema.com/femaNews/disasterSearch.do](https://www.fema.com/femaNews/disasterSearch.do)
- New Changing Climate, Weather and Air Quality: [http://www.neci.sr.unh.edu/neccwaq.html](http://www.neci.sr.unh.edu/neccwaq.html)
- The Disaster Center (NH): [http://www.disastercenter.com/newhamp/tornado.html](http://www.disastercenter.com/newhamp/tornado.html)
Map 2: Historic Wildfires & Wildland Urban Interface

(11" x 17" maps included in appendix of hard copy plans)
Map 3: Historic & Potential Hazards

(11” x 17” maps included in appendix of hard copy plans)
Chapter IV: Critical Infrastructure & Key Resources (CIKR)

With Team discussion and brainstorming, Critical Infrastructure and Key Resources (CIKR) within Northumberland were identified and mapped for this Plan. The “ID” numbers in the following lists are also represented in the CIKR maps, Maps 4.1 and 4.2. Facilities located in adjacent towns were not mapped.

Table 4.1 – Emergency Response Facilities

**EMERGENCY RESPONSE FACILITIES (ERF)**

<table>
<thead>
<tr>
<th>CIKR</th>
<th>Map ID</th>
<th>Facility</th>
<th>Type of Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERF</td>
<td>1</td>
<td>Town Offices (no generator)</td>
<td>EOC &amp; EMS</td>
</tr>
<tr>
<td>ERF &amp; FPP</td>
<td>2</td>
<td>High School</td>
<td>Primary Shelter</td>
</tr>
<tr>
<td>ERF</td>
<td>3</td>
<td>Police Station</td>
<td>Police &amp; Animal Officer</td>
</tr>
<tr>
<td>ERF</td>
<td>4</td>
<td>Fire Station (generator)</td>
<td>Fire Response &amp; EMS</td>
</tr>
<tr>
<td>ERF &amp; PR</td>
<td>5</td>
<td>Weeks Medical Center Clinic (no generator)</td>
<td>Medical Services - Clinic</td>
</tr>
<tr>
<td>ERF</td>
<td>6</td>
<td>Town Garage (generator)</td>
<td>Town Services; Equipment; Road, Drainage</td>
</tr>
<tr>
<td>ERF</td>
<td>7</td>
<td>Fairpoint Switching Station</td>
<td>Communications</td>
</tr>
<tr>
<td>ERF</td>
<td>8</td>
<td>Pump Station (Mayhew Lane)</td>
<td>Water Supply</td>
</tr>
<tr>
<td>ERF</td>
<td>9</td>
<td>Pump Station (Route 110)</td>
<td>Sewerage Treatment</td>
</tr>
<tr>
<td>ERF</td>
<td>10</td>
<td>Prima-America</td>
<td>Business</td>
</tr>
<tr>
<td>ERFB</td>
<td>11</td>
<td>Bridge at intersection of Routes 3 &amp; 110</td>
<td>Evacuation Bridge</td>
</tr>
<tr>
<td>ERFH &amp; FPP</td>
<td>12</td>
<td>Riverside Speedway</td>
<td>Helicopter Emergency Landing Zone</td>
</tr>
<tr>
<td>ERFH</td>
<td>13</td>
<td>Small Ball Field</td>
<td>Helicopter Emergency Landing Zone</td>
</tr>
<tr>
<td>ERFH</td>
<td>14</td>
<td>Ocean State Parking Lot</td>
<td>Helicopter Emergency Landing Zone</td>
</tr>
<tr>
<td>ERFH</td>
<td>15</td>
<td>Gray Farm Fields</td>
<td>Helicopter Emergency Landing Zone</td>
</tr>
<tr>
<td>ERFH</td>
<td>16</td>
<td>Emerson's Parking Lot</td>
<td>Helicopter Emergency Landing Zone</td>
</tr>
<tr>
<td>ERFH</td>
<td>17</td>
<td>Big Ball Field</td>
<td>Helicopter Emergency Landing Zone</td>
</tr>
<tr>
<td>ERF</td>
<td>NM</td>
<td>Berry Transportation (buses on Route 3 by mill; drivers and busses are local)</td>
<td>Mass Transportation</td>
</tr>
</tbody>
</table>
**EVACUATION ROUTES**

<table>
<thead>
<tr>
<th>ERF</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>US Route 3</td>
</tr>
<tr>
<td>2</td>
<td>NH Route 110</td>
</tr>
<tr>
<td>3</td>
<td>Lost Nation Road</td>
</tr>
</tbody>
</table>

**Table 4.2 – Non-Emergency Response Facilities**

**NON-EMERGENCY RESPONSE FACILITIES (NERF)**

NERF’S are facilities, which although critical, are not necessary for the immediate emergency response efforts. This would include facilities to protect public health and safety and to provide backup emergency facilities. NM = Not Mapped.

<table>
<thead>
<tr>
<th>Town</th>
<th>Map ID</th>
<th>Facility</th>
<th>Type of Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>NERF</td>
<td>18</td>
<td>Legion Hall</td>
<td>Secondary Shelter</td>
</tr>
<tr>
<td>NERF</td>
<td>19</td>
<td>Ocean State Plaza</td>
<td>Triage Center Weeks Hospital</td>
</tr>
<tr>
<td>NERF</td>
<td>20</td>
<td>Sewerage Treatment Plant</td>
<td>Water Supply</td>
</tr>
<tr>
<td>NERF</td>
<td>21</td>
<td>Electric Power Station (still functional/not used)</td>
<td>Backup Power Generator</td>
</tr>
<tr>
<td>NERF</td>
<td>22</td>
<td>Mountain View Substation</td>
<td>Electric Substation</td>
</tr>
<tr>
<td>NERF</td>
<td>23</td>
<td>Mountain View Hydro &amp; Dam</td>
<td>Hydro Substation &amp; Dam</td>
</tr>
<tr>
<td>NERF</td>
<td>24</td>
<td>Dam at Mill</td>
<td>Dam</td>
</tr>
<tr>
<td>NERF</td>
<td>25</td>
<td>Natural Gas Pipeline-Crossing Route 3</td>
<td>Natural Gas Pipeline</td>
</tr>
<tr>
<td>NERF</td>
<td>26</td>
<td>Natural Gas Pipeline-Ball Road</td>
<td>Natural Gas Pipeline (small)</td>
</tr>
<tr>
<td>NERF</td>
<td>27</td>
<td>Natural Gas Pipeline-Covered Bridge</td>
<td>Natural Gas Pipeline (very large)</td>
</tr>
<tr>
<td>NERF &amp; PR</td>
<td>28</td>
<td>NH DOT Garage</td>
<td>Equipment &amp; Personnel</td>
</tr>
<tr>
<td>NERF</td>
<td>29</td>
<td>Pumping Station (Village Road)</td>
<td>Sewerage</td>
</tr>
<tr>
<td>NERF</td>
<td>30</td>
<td>Water Tank - Main Water Supply</td>
<td>Water Supply</td>
</tr>
<tr>
<td>NERF</td>
<td>31</td>
<td>Water Tank (Northumberland Village)</td>
<td>Water Supply</td>
</tr>
<tr>
<td>NERF</td>
<td>32</td>
<td>Water Tank (Lost Nation)</td>
<td>Water Supply</td>
</tr>
</tbody>
</table>
Table 4.3 – Facilities & Populations to Protect

<table>
<thead>
<tr>
<th>CIKR</th>
<th>Map ID</th>
<th>Facility</th>
<th>Type of Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPP</td>
<td>33</td>
<td>Melcher Court</td>
<td>Assisted Living</td>
</tr>
<tr>
<td>FPP</td>
<td>2</td>
<td>High School</td>
<td>Public School Children</td>
</tr>
<tr>
<td>FPP</td>
<td>34</td>
<td>Elementary School</td>
<td>Public School Children</td>
</tr>
<tr>
<td>FPP</td>
<td>35</td>
<td>Head Start</td>
<td>Child Care</td>
</tr>
<tr>
<td>FPP</td>
<td>36</td>
<td>Groveton Housing</td>
<td>Assisted Living</td>
</tr>
<tr>
<td>FPP</td>
<td>37</td>
<td>Hickey Day Care</td>
<td>Child Care</td>
</tr>
<tr>
<td>FPP</td>
<td>12</td>
<td>Riverside Speedway</td>
<td>Gathering of People</td>
</tr>
</tbody>
</table>

Table 4.4 – Potential Resources

<table>
<thead>
<tr>
<th>Town</th>
<th>Map ID</th>
<th>Resource</th>
<th>Type of Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR</td>
<td>38</td>
<td>Al's Plumbing</td>
<td>Heating Oil, Kerosene, Pellets; Plumber</td>
</tr>
<tr>
<td>PR</td>
<td>39</td>
<td>Tim Savage</td>
<td>Carpenter</td>
</tr>
<tr>
<td>PR</td>
<td>40</td>
<td>The Village Store</td>
<td>Food Supply</td>
</tr>
<tr>
<td>PR</td>
<td>41</td>
<td>Ocean State Job Lots</td>
<td>Food, Clothing, Hardware, Etc.</td>
</tr>
<tr>
<td>PR</td>
<td>42</td>
<td>Perras Lumber Supply</td>
<td>Lumber &amp; Hardware; Propane</td>
</tr>
<tr>
<td>PR &amp; NERF</td>
<td>28</td>
<td>NH DOT Garage</td>
<td>Diesel &amp; Equipment</td>
</tr>
<tr>
<td>PR</td>
<td>43</td>
<td>Normandeau Trucking</td>
<td>Heavy Equipment</td>
</tr>
<tr>
<td>PR</td>
<td>44</td>
<td>DNS Wrecking</td>
<td>Wrecker</td>
</tr>
<tr>
<td>PR</td>
<td>45</td>
<td>Calvin Crawford</td>
<td>Plumbing</td>
</tr>
<tr>
<td>PR</td>
<td>46</td>
<td>Brian Meunier</td>
<td>Carpenter</td>
</tr>
<tr>
<td>PR &amp; ERF</td>
<td>5</td>
<td>Weeks Medical Center</td>
<td>Pharmacy; Medical</td>
</tr>
<tr>
<td>PR</td>
<td>NM</td>
<td>NH DOT (Lancaster)</td>
<td>Diesel and Gas &amp; Equipment</td>
</tr>
</tbody>
</table>
Map 4.1: Critical Infrastructure & Key Resources
(11" x 17" maps included in hard copy plans)
Map 4.2: Critical Infrastructure & Key Resources, Detail
(11" x 17" maps included in hard copy plans)
Chapter V. Multi-Hazard Effects in Northumberland

A. Identifying Vulnerable Structures

Because damages from floods and wildfires are more predictable than damages from other disasters, it is important to identify the critical infrastructure and other structures that are most likely to be damaged by these events. Using GIS analysis and aerial imagery, at-risk structures were identified throughout the Town.

First, all structures falling within the FEMA flood map for the Town were identified in GIS; this list was then narrowed by those structures that were on the Town’s CIKR list (Tables 4.1-4.4). Eleven CIKRs were found in the flood zone. Of these, six were identified as having structures that are susceptible to flooding and that if damaged, could impact the community. The chart to the right identifies these CIKR along with their assessed structure values if applicable.

In summary, the potential loss of these CIKR due to flooding is $7,582,684, based on the 2010 assessed structure value and a medium risk of 28%.

Using the same methodology that was used for flooding, structures falling within the Wildland Urban Interface (WUI) were reviewed. Identifying these structures assists the Team in creating mitigation strategies and prioritizing those strategies; it is important to determine which Critical Infrastructure and Key Resources are most vulnerable to wildfires and to estimate their potential loss.

Ten CIKR were found in the WUI; of these, eight were identified as having structures that are susceptible to wildfire and that if damaged, could impact the community. The chart to the left identifies these CIKR along with their assessed structure values if applicable.

In summary, the potential loss of these CIKR due to wildfire is $4,062,436 based on the 2010 assessed structure value and a medium risk of 28%.

For all other hazards, besides flood and wildfire, the HSEM matrix identified in Table 3.1 is used to evaluate likelihood and potential impact of each hazard.
B. Calculating the Potential Loss

It is difficult to ascertain the amount of damage that could be caused by a natural or man-made hazard because the damage will depend on the hazard’s extent and severity, making each hazard event somewhat unique. Therefore, we have used the assumption that hazards that impact structures could result in damage to either 0-1% or 1-5% of Northumberland’s structures, depending on the nature of the hazard and whether or not the hazard is localized.

<table>
<thead>
<tr>
<th>Assessed Value of All Structures in Town</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Residential</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>$61,082,400</td>
</tr>
<tr>
<td>$610,824</td>
</tr>
<tr>
<td>$3,054,120</td>
</tr>
<tr>
<td>Manufactured</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>$4,618,200</td>
</tr>
<tr>
<td>$46,182</td>
</tr>
<tr>
<td>$230,910</td>
</tr>
<tr>
<td>Commercial</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>$16,702,600</td>
</tr>
<tr>
<td>$167,026</td>
</tr>
<tr>
<td>$835,130</td>
</tr>
<tr>
<td>Exempt</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>$10,435,215</td>
</tr>
<tr>
<td>$104,352</td>
</tr>
<tr>
<td>$521,761</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>$92,838,415</td>
</tr>
<tr>
<td>$928,384</td>
</tr>
<tr>
<td>$4,641,921</td>
</tr>
</tbody>
</table>

Based on this assumption, the potential loss from any of the identified hazards would range from $0 to $928,384 or $928,384 to $4,641,921 based on the 2010 Northumberland town valuations. The assessed value of all structures in Northumberland is $92,838,415 (see chart above).

Human loss of life was not included in the potential loss estimates, but could be expected to occur, depending on the severity and type of the hazard.

The Hazards

1) Winter Storms (including Ice Storms) ........................................................................................................... $928,384 to $4,641,921

Heavy snowstorms typically occur from December through April. New England usually experiences at least one or two heavy snow storms with varying degrees of severity each year. Power outages, extreme cold and impacts to infrastructure are all effects of winter storms that have been felt in Northumberland in the past. All of these impacts are a risk to the community, including isolation, especially of the elderly, and increased traffic accidents. Damage caused as a result of this type of hazard varies according to wind velocity, snow accumulation, duration and moisture content. Seasonal accumulation can also be as significant as an individual snowstorm.

Northumberland’s geography only adds to the likelihood of severe winter weather. Ice jams on the Upper Ammonoosuc River and the Connecticut River by Riverside Speedway, weather patterns that follow the Connecticut River and howling winds that come off Cape Horn add to the impact of winter storms. Winter snow and ice storms often cause trees to fall creating widespread power outages by downing power lines. Road closures result from heavy snow accumulations, ice storms and downed power lines. Several areas of Town including the intersection of Routes 110 and 3 and the steep terrain of First, State and Church Streets are prone to vehicular accidents, particular during snow and icy road conditions.

Flooding caused by ice jams on the Upper Ammonoosuc River along with an extended loss of power creates isolation of the elderly and handicapped. In addition, heavy snow and ice storms can collapse roofs and cause widespread damage to forested areas. The 1998 ice storm inflicted several million dollars’ worth of damage to northern New Hampshire’s forests and structures and also impacted Northumberland. Ice storms in Northumberland could be expected to cause damage ranging from a few thousand dollars to several million, depending on the severity of the storm.
Due to the potential widespread nature of winter storm events of this kind, particularly ice storms, the potential loss value is estimated to be between 1% and 5% of the total assessed value of all structures in town.

2) High Winds (windstorm) .................................................................................................................. $0 to $850,623

Due to the geography and the location of Northumberland, the steep terrains that can be found on Cape Horn and its proximity to the Connecticut River and the peaks of the White Mountains, isolated high winds and down drafts often occur within the Town. These wind events are unpredictable; winds of this magnitude could fall timber, which in turn could block both rural and major roadways, down power lines (none of which are underground) and impair emergency response. A wind tunnel effect is known to exist on Lost Nation Road and on Page Hill Road.

The effect of isolated high winds would most likely be localized in nature; therefore, the potential loss value due to hazards of this type was determined to be between 0% and 1% of the total assessed structure value.

3) Flooding ............................................................................................................................................ $2,401,569

Flooding is often associated with hurricanes, heavy rains, ice jams and rapid snow melt in the spring; Northumberland has been impacted by this type of flooding in the past, both along the Connecticut River and the Upper Ammonoosuc River. River bank erosion, road washouts and overburdened culverts have been the effects of this type of flooding in Northumberland. Refer to Table 3.2 and for more information on past flood related events.

Based on the Coos County Floodplain Map, Northumberland’s 100-year floodplain is primarily along the Connecticut River and the Upper Ammonoosuc River; fortunately settlement in the fertile flood zone along the Connecticut is minimal. Northumberland Village, the Old Village Road and Riverside Speedway have all been impacted by Connecticut River flooding. Flooding along the Upper Ammonoosuc River is generally the result of heavy rain, ice jams and rapid snowmelt causing the riverbank to overflow. There are several other smaller flood zones in town, located generally around small lakes and streams. Roaring Brook has flooded Brooklyn Street in the past. (See Map #3)

Using GIS analysis, approximately 108 structures (including the CIKR) were found to be in the FEMA floodplain (see table above right). By averaging the value of all structures in Town and multiplying by the number in the floodplain, an estimated assessed value of these structures is $8,577,031. Using a medium risk of 28%, the potential loss value was estimated to be $2,401,569.

The Team felt that flooding is a serious concern in Northumberland and ranked it third in the Multi-Hazard Threat Matrix (Table 3.1). It should be noted however, that dam failure further up the Connecticut River could result in a much higher significant loss; the Town is aware of and has available the Murphy Dam Inundation Map developed for use in the Murphy Dam Emergency Action Plan by the NH Department of Environmental Services (DES).
Connecticut River Flooding
April 2011

Old Village Road (lower end)
Photo Credit: June Garneau

Old Village Road (upper end)
Photo Credit: Richard Brooks

Connecticut River in Northumberland Village
Photo Credit: June Garneau

Railroad Track inundated by Connecticut River near Northumberland Village
Photo Credit: June Garneau
Perras Road
Photo Credit: June Garneau

Riverside Speedway
Photo Credit: Richard Brooks

Riverside Speedway
Photo Credit: Richard Brooks

Riverside Speedway
Photo Credit: Richard Brooks

Connecticut River Flooding
Photo Credit: June Garneau
4) Hazardous Material Transport

The possibility of vehicular accidents involving hazardous materials is identified as a serious hazard in Northumberland. The Town has two major routes, US Route 3 and NH Route 110. These major thoroughfares are heavily travelled, both by large and small vehicles; the contents of these vehicles are rarely known. Tractor trailers hauling fuel, propane and other hazardous materials travel through Northumberland on a constant basis, travelling north-south from southern New England and into Canada and east-west from Northumberland to Berlin and beyond to Portland, ME. Transiting truck traffic travels through Northumberland from Canada to get almost anywhere in New England. Additionally, several roads in town are particularly steep and are prone to vehicular and truck accidents, particular in poor weather conditions; these include, but are not limited to Alice Drive and steep terrain along Lost Nation Road.

Also, an active rail line travels north-south through town and is subject to derailments; trains along this line often carry chemicals that are unknown to Town officials.

Factors affecting the likelihood of a vehicular accident involving hazardous material include icy roads, snow accumulation, road flooding and other environmental factors. Potential losses could vary greatly depending on the location of an event and any associated fire or explosions; an accident in the Village District could have serious impact. Although an event of this kind would be localized by nature, due to the possibility of it occurring in the downtown area the potential loss value is estimated at 1% and 5% of the assessed value of all structures in town.

5) Hazardous Material Fixed Location

Hazardous Material in a Fixed Location is a concern in many of New Hampshire’s communities. Manufacturers, gas stations, fuel depots, small businesses and even homes can be found to have hazardous chemicals, explosive materials or poisons on site. Breaches in the storage, use, production or disposal can affect the groundwater, aquifers and water supply of a community as well as the air we breathe.

Several facilities contribute to the potential risk for a hazardous material in a fixed location event in Northumberland. They include: the natural gas pipeline, the soon to be built biomass plant, and above ground petroleum products storage tanks at a local plumbing and heating facility.

Because the risk of a hazard material explosion or leak is localized, potential loss from this hazard was estimated to be between 0% and 1% of the total assessed structure value.

6) Extended Power Failure

Extended power outages have occurred in Northumberland, both as a result of local line damage from high winds and storms and problems with the power grid. If a major and/or extended power outage occurs and lasts for more than a week, a significant hardship on individual residents could result, particularly those citizens who are elderly, handicapped or poor. There are three assisted living facilities in the community. Air quality during summer months with no air conditioning, the lack of heat and frozen pipes during winter months and a quickly diminished
food supply are among the Town’s biggest concerns. In addition, although town water is provided to some citizens, many others rely on well water and pumps; without power these wells would not produce.

Local businesses and communication could also be impacted. Cell phone coverage in Northumberland is spotty, but during an extended power failure, those who do have coverage will be unable to replace or charge their batteries. The business impact would be minimal, as Northumberland currently has only a few small business; however an extended period of time without power could hurt not only individual business owners but the community in general.

Generators are also an issue in Northumberland. Currently, the Fire Station the Highway Garage are the only departments with working generators. The Primary Shelter, the Northumberland High School, does not have a generator nor does the Police Station or the Town Offices. Funding for a new Town Office will hopefully enable the Town to purchase a new generator for that building.

Due to the potential effects of an extended power failure, whether during summer or winter months, the potential loss value is estimated to be between 0% and 1% of the total assessed value of all structures in town.

7) Extreme Temperatures .......................................................... Structure Loss Value Cannot Be Estimated

For those who are familiar with Northern New England weather, it is obvious that temperature extremes are very common. Winter temperatures can fall below -30°F and summer temperatures, laden with high humidity can soar to nearly 100°F. In the past, there was more concern about extreme cold temperatures, but with improved heating systems and local communications, most New Hampshire residents are better able to cope with extreme cold.

Also of concern today are extreme heat conditions, becoming more common with climate change. Few residents, particularly the elderly, the poor and vulnerable populations, have air conditioners and are less able to cope with extreme heat; Northumberland has a high poverty level (12.3%) and a relatively high percentage of elder citizens (16%).

Extreme temperatures when combined with power failure are of the most concern; power failure could result in no water, heat and air conditioning for the Town’s vulnerable population. Both town officials and the community as a whole should be concerned and should look after its citizens to ensure that extreme temperatures do not create a life or property threatening disaster. To mitigate the impact of extreme temperatures on the community, the Team has included a mitigation strategy that will keep the Town’s pool open longer and provide both a cooling and heating station at the Town Office.

8) Violent Crime ........................................................................ $0 to $928,384

Although not a “natural hazard”, the Team chose to identify violent crime as a significant problem. Most of the Town’s crime issues revolve around human issues such as the high unemployment rate, weak parenting skills and an abundance of lower income households. The quality of life for some residences is low with 12.3% of the
population below the poverty level.

In the recent past, Northumberland has seen an increase in home and auto burglaries and the theft of copper piping that can be sold for cash. The poor economy has also resulted in more domestic violence issues and drug related police calls.

Violent crime, and crime in general, can come in many forms thus assessing potential loss value is difficult. However, since crime can potentially produce structure damage that would likely be localized, the potential loss value was determined to be 0-1% of the total assessed structure value in town.

9) Epidemic & Pandemic................................................................. Structure Loss Value Cannot Be Estimated

Northumberland’s unique geography provides hikers and summer and winter recreation enthusiasts opportunities to visit the Town; however, the use of the land for recreational purposes is primarily by local residents. The Team noted that there is generally little or no increase in population on weekends in either summer or winter and in fact, the population may decrease somewhat during the winter as residents spend time in warmer climates.

Also, Northumberland’s children do not attend school in neighboring towns; the community has its own elementary, middle and high schools. A few students do travel to other schools for vocational training and this may enable infection and viruses to be transmitted from elsewhere.

Because of these factors, the Team decided that an epidemic or pandemic is unlikely to present a possible threat to Northumberland, but it could not be ruled out entirely. With the occurrence of world-wide pandemics such as SARS, H1N1 and Avian Flu, Northumberland could be susceptible to an epidemic and subsequent quarantine.

10) Severe Thunderstorms & Lightning................................................................. $0 to $928,384

Severe lightning as a result of summer and mountain storms or as a residual effect from hurricanes and tornadoes has occurred in Northumberland. Some of the Town’s structures are older buildings and many are surrounded by forest. Dry timber on the forest floor and the age of many buildings and out-buildings combined with lightning strikes can pose a significant disaster threat. Lightning could do damage to specific structures, injure or kill an individual but the direct damage would not be widespread.

Although lightning is a potential problem, the Town reports few occurrences, none of which were severe. Of more concern than lightning strikes are the heavy rains that thunderstorms can produce and the subsequent erosion of ditches and roadways.

Based on the localized nature of lightning strikes and erosion, the potential loss value was determined to be 0-1% of the total assessed structure value in town.
11) Wildfire ............................................................................................................................ $1,823,413

There are two main potential losses with a wildfire: the forest itself and the threat to the built-up human environment (the structures within the WUI). In many cases, the only time it is feasible for a community to control a forest fire is when it threatens the built-up human environment. Therefore, the loss to the forest itself will not be a factor in our loss calculation analysis.

The Wildland Urban Interface was determined in collaboration with the NH Division of Forests & Lands and the US Forest Service; the WUI represents the area in which the forest and human habitation intersect. It was defined to be a 1/4 mile buffer located 300 feet off the centerline of Class I-V roads. All structures within this WUI were assumed to be at some level of risk and, therefore, vulnerable to wildfire. (See Map 2)

Due to the abundance of slash on the forest floor left by logging operations and blow downs, there is potential for fast burning fuels. However, the Team noted that during the lumber baron days of New Hampshire’s history, the entire area had been clear-cut. The resulting new growth is mostly hardwood trees, and although a wildfire could certainly occur, the likelihood is small. In addition, trains travelling through Northumberland are now better equipped to eliminate sparks.

Eighty two structures were identified through GIS analysis as being located in the WUI. Evaluating the average value of structures in town and then multiplying that number by the estimated number of structures in the WUI resulted in a potential loss of $6,512,190. Then, assuming a 28% (medium) risk for wildfire, the total potential loss value was estimated to be $1,823,413 (refer to table above right).

12) Terrorism........................................................................................................................ Structure Loss Value Cannot Be Estimated

Terrorism is a fear throughout our country and the world, but Northumberland is not a likely target. With no large businesses currently in town, there are few likely “targets” for a terrorist attack. Possible targets, although unlikely, could be NH Route 110 and US Route 3, the rail line and the natural gas pipeline that travels through Town. Nonetheless, terrorism is identified as a remote, although possible hazard for the Town.

13) Dam Failure ...................................................................................................................... $0 to $928,384

Northumberland could be impacted by the failure of small dams in town but the impact would likely not be significant. In the past, the Old Village Road was flooded as a result of a breach in the Weston Dam, but no other significant in-town dam breaches have occurred.

However, it should be noted that an upstream dam breach along the Connecticut River, such as a breach of Murphy Dam in Pittsburg at the headwaters of the Connecticut River, would create a domino effect for dams downstream as far as the Massachusetts state line, and could result in significant flooding in Northumberland. As expressed by the Team, an event of this magnitude could be a major disaster.
At this time, there does not appear to be a serious threat of major dam breaches on the upper Connecticut River, therefore the estimated potential loss value is based on the dams that are currently operating in Town. Based on the localized nature of these dams and any potential breach, the potential loss value was determined to be between 0% and 1%.

14) Hurricane

Wind damage due to hurricane is a consideration because of the forest and valley floors in Northumberland. Like the 1938 hurricane and hurricane Carol in 1954, major forest damage could occur. Although hurricanes could fit into several different categories (wind and flooding), the Team considered hurricanes to be separate events. Hurricanes are rare in Northumberland and in New Hampshire, but they should not be ruled out as a potential hazard. Due to the infrequency of hurricanes in this part of the state, the potential loss value due to hurricanes was determined to be between 0% and 1% of the total assessed structure value.

15) Erosion, Mudslide, Landslides

Erosion, landslides and mudslides are often associated with heavy rains, steep terrain and the overflow of river banks. Steep terrain combined with heavy rain and loose groundcover creates the conditions for landslides. Erosion and the subsequent loss of land along the river banks, road washouts, overburdened culverts and changes in the course of rivers are erosion issues in Northumberland. The Maple Street area is particularly prone to road erosion.

Of great concern is Northumberland Public Cemetery. Erosion along the Connecticut River has and continues to threaten the graves that are located in this cemetery; frankly put, the cemetery is falling into the Connecticut River. In the past the Town has moved nine graves at tax payers’ expense.

The cost of erosions, mudslides and landslides in Northumberland are difficult to calculate as costs would primarily result from road damage and closures, riverbank erosion and the loss of the cemetery rather than direct structure damage. Therefore, the potential loss value to structures due to landslides could not be determined.

16) Tornadoes, Microburst or Macroburst

The biggest difference between tornadoes, microbursts and macrobursts is the direction, size and the location that the wind comes from, but all can cause significant damage.

A tornado generally covers a large area, perhaps even several miles. It has winds that blow in a circular fashion leaving behind downed trees that lie in a swirling pattern. Straight-line winds and winds that burst downward are indicative of a microburst; the fallen trees that are left behind lay in roughly the same direction. A microburst must be 2.5 miles in width of less, whereas a macroburst is a similar wind event that is greater than 2.5 miles wide and generally lasts longer than a microburst.
Tornadoes are relatively uncommon natural hazards in New Hampshire; on average, about six touch down each year. Damage largely depends on where the tornado strikes. If it were to strike an inhabited area, the impact could be severe. In the State of New Hampshire, the total cost of tornadoes between 1950 and 1995 was $9,071,389\textsuperscript{6}. More common in Northumberland would be a microburst event; these are becoming more and more common in the North Country and could result in damage. Lost Nation Road, known to some as “tornado alley” and Page Hill Road have been susceptible to microbursts in the past.

Like high winds, the affects would be primarily power outages and blow downs; however, if a tornado, microburst or macroburst were severe enough, property damage could also occur. Due to the rareness of these events in New Hampshire and Northumberland’s geography, the likelihood of an event of this type is low and the affects would be localized. Therefore, the potential loss value was determined to be between 0% and 1%.

17) Hailstorm............................................................................................................................................ $0 to $928,384

Hailstorm events, although not common in Northumberland, can occur at any time; the spring and summer of 2009 saw random hailstorm occurrences throughout the northern regions of New Hampshire. Damage from hail could result in failed crops and structure and vehicular damage, thus creating an economic impact for individual citizens. It should be noted however, that although Northumberland has few remaining farms, the community is not heavily farmed. Overall, the Team concurred that a hailstorm event would be unlikely and would cause minimal damage. Therefore, the potential loss value due to hailstorm was determined to be between 0% and 1% of the total assessed structure value.

18) Drought.................................................................................................................................................. $0 to $928,384

An extended period without precipitation could elevate the risk for wildfire and blow-downs in the forest and with an extreme drought, the water supply and aquifer levels could be threatened; many of the Town residents rely on their own wells. Fortunately, significant droughts rarely occur in New Hampshire or Northumberland. According to the NH Department of Environmental Services, five significant droughts have occurred since 1929.\textsuperscript{7}

The cost of drought in Northumberland is difficult to calculate as any cost would primarily result from an associated fire risk and diminished water supply. Therefore, the potential loss value due to drought was determined to be between 0% and 1% of the total assessed structure value.

\textsuperscript{6} The Disaster Center (NH); http://www.disastercenter.com/newhamp/tornado.html
\textsuperscript{7} NH DES; http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf
Chapter VI: Multi-Hazard Goals and Existing Mitigation Strategies

A. Multi-Hazard Mitigation Goals

Before identifying new mitigation actions to be implemented, the Team established and adopted the following multi-hazard goals. These goals were based on the State of New Hampshire Natural Hazards Mitigation Plan that was prepared and is maintained by HSEM.

- To improve upon the protection of the general population, the citizens of Northumberland and visitors, from all natural and man-made hazards.
- To reduce the potential impact of natural and man-made disasters on Northumberland’s critical support services.
- To reduce the potential impact of natural and man-made disasters on Northumberland’s critical infrastructure and key resources.
- To improve Northumberland emergency preparedness, disaster response and recovery capabilities.
- To reduce the potential impact of natural and man-made disasters on private property.
- To reduce the potential impact of natural and man-made disasters on Northumberland’s economy.
- To reduce the potential impact of natural and man-made disasters on Northumberland’s natural environment.
- To reduce Northumberland’s potential exposure to risk with respect to natural and man-made hazards in general.
- To reduce the potential impact of natural and man-made disasters on Northumberland’s specific historic treasures and interests, as well as other tangible and intangible characteristics that add to the quality of life of the citizens and visitors to Northumberland.
- To identify, introduce and implement cost effective hazard mitigation measures so as to accomplish Northumberland’s goals and objectives and to raise the awareness and acceptance of hazard mitigation opportunities in general.  

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8 Goals are based primarily on the State of New Hampshire’s Hazard Mitigation Goals (Natural Hazard Mitigation Plan, 2004) and are taken from the 2009 Multi-Hazard Plan format created by NCC.
B. Types of Mitigation Strategies Developed

The following list of mitigation categories and possible strategy ideas was compiled from a number of sources including the USFS, FEMA, other Planners and past Multi-Hazard Mitigation Plans. This list was used during a brainstorming session to discuss what issues there may be in Town. Team involvement and the brainstorming sessions proved helpful in bringing out new ideas, better relationships and a more in depth knowledge of the community. As Dwight Eisenhower once said, “Plans are nothing; planning is everything”

**Prevention**
- Forest fire fuel reduction programs
- Open space preservation initiatives
- Performance standards
- Special management regulations
- Fire Protection Codes NFPA 1
- Culvert and hydrant maintenance

**Education and Awareness**
- Hazard information centers
- Public education and outreach programs
- Emergency website creation
- “Firewise” training
- Emergency Training for Town officials
- Ongoing training for first responders

**Property Protection**
- Acquisition or easements
- Current use or other conservation measures
- Relocation of hazard prone areas
- Transfer of development rights

**Natural Resource Protection**
- Best management practices within the forest
- Forest and vegetation management
- Forestry and landscape management
- Wetlands development regulations

**Emergency Preparedness**
- Water availability
- Water sustainability
- Emergency Response Plan
- Equipment necessary for response
- Designated evacuation routes
- Hazard warning systems, sirens
- Hazard threat recognition
- EOC location & coordination
- Shelter preparation & management
- School Emergency Operation Plans

**Emergency Preparedness (continued)**
- Available food and supplies
- Available dam plans
- Emergency generator assessment

**Emergency Response**
- Emergency medical services
- Hospital & clinic availability
- Fire & police departments
- Mutual aid
- Points of distribution
- Portable EMS potential

**Infrastructure Protection**
- Critical facilities protection
- Critical infrastructure protection

**Structure Protection**
- High risk notification for homeowners
- Defensible space brochures
- Real estate disclosures

**Town Planning**
- Local building codes
- Zoning & subdivision ordinances
- Development regulations
- Density controls
- Driveway standards
- Slope development regulations
- Master Plan
- Capital improvement program
- Water Resource Plan

**Communication**
- Coordination with other agencies, NC RC&D, USFS, DRED
- Interdepartmental communication needs
- Public hazard notification
- EOC communications
C. Mitigation Strategies currently Underway in Northumberland

After researching historic hazards, identifying CIKR and determining potential hazards, the Team determined what is already being done to limit potential damages from these hazards.

Once identified, the Team addressed each “current” strategy to determine its effectiveness and to determine whether or not improvements were needed. This analysis became one of the tools the Team used to identify new mitigation strategies.

With the knowledge of what regulations Northumberland currently had in place, creating new strategies was less difficult. This process was helpful in identifying those who may be responsible for implementation of mitigation strategies, those strategies that are working well, and those that should be addressed as a “new” strategy. The table that follows, Table 6.1, Existing Mitigation Strategies, lists current mitigation strategies and the analysis that resulted from discussion.

Below is a list of the current mitigation strategies that are detailed on the following page:

- Floodplain Ordinance (part of Zoning Regulations)
- Master Plan
- Connecticut River Joint Commission
- 911 Program
- Subdivision Regulations
- Building permits
- Fire Permits
- Fire & Police Department Training
- Mutual Aid (Fire, Ambulance & Police
- All Hazard Mitigation Plan
- Emergency Operations Plan
- School Emergency Operations Plan
- School Call System
- Fire Horn
- Site Plan Review
- Dam Inspection at Mill
- Road Standards
- Zoning Regulations
- NFIP
- NIMS & ICS Training for Town Officials

Refer to Table 6.1, the Bibliography, and data in yellow-highlighted boxes in this plan for specific examples. Heavy reliance was placed on previously approved all-hazards mitigation plans and copies of wildfire plans obtained from other towns and counties. A handout was compiled and given to the emergency management director of common data and another with potential mitigation strategies that the Town should consider. GIS mapping models and several examples were provided to the Team for their general information.
**Table 6.1: Existing Mitigation Strategies**

<table>
<thead>
<tr>
<th>Existing Program or Activity</th>
<th>Description</th>
<th>Area of Town Covered</th>
<th>Office of Primary Responsibility</th>
<th>Effectiveness</th>
<th>Improvements or Changes Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floodplain Ordinance (part of Zoning Regulations)</td>
<td>The ordinance regulates the construction of structures in the floodplain areas in order to protect people and property, make sure federal flood insurance is available, save tax dollars and avoid liability and laws suits</td>
<td>Floodplain areas along the CT &amp; Upper Ammonoosuc Rivers</td>
<td>Office of the Selectmen</td>
<td>Good</td>
<td>None Needed - Updated periodically</td>
</tr>
<tr>
<td>Master Plan (2003)</td>
<td>Includes goals and objectives for future development of the Town and identifies future development patterns.</td>
<td>Town Wide</td>
<td>Planning Board</td>
<td>Good</td>
<td>None Needed</td>
</tr>
<tr>
<td>Connecticut River Joint Commission</td>
<td>Project by CRCJ which is studying the erosion activity along the CT River and the effects erosion on the Northumberland Cemetery.</td>
<td>Along CT River</td>
<td>Connecticut River Joint Commission</td>
<td>N/A Being Developed</td>
<td>None Needed</td>
</tr>
<tr>
<td>911 Program</td>
<td>Standardize house numbering along Northumberland's streets and roads</td>
<td>Town Wide</td>
<td>Fire Department &amp; EMS</td>
<td>Good</td>
<td>Should be reviewed for compliance</td>
</tr>
<tr>
<td>Subdivision Regulations</td>
<td>Includes fire and emergency access, drainage, floodplain and bonding provisions.</td>
<td>Town Wide</td>
<td>Planning Board</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>Building permits</td>
<td>Building permits are required for all new building and substantial improvements.</td>
<td>Town Wide</td>
<td>Select Board &amp; Fire Chief</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>Fire Permits</td>
<td>NH Forest and Lands (DRED) require fire permits for open burning per state regulations.</td>
<td>Town Wide</td>
<td>Fire Department &amp; EMS</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>Fire &amp; Police Department Training</td>
<td>Fire &amp; Police Department personnel receive yearly training; all training completed and updates on a regular basis.</td>
<td>Town Wide</td>
<td>Fire &amp; Police Departments</td>
<td>Good</td>
<td>None Needed</td>
</tr>
<tr>
<td>Existing Program or Activity</td>
<td>Description</td>
<td>Area of Town Covered</td>
<td>Office of Primary Responsibility</td>
<td>Effectiveness</td>
<td>Improvements or Changes Needed</td>
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</tr>
<tr>
<td>Mutual Aid (Fire, Ambulance &amp; Police)</td>
<td>Mutual aid agreements are in place to offer mutual assistance to the Fire, Ambulance &amp; Police Departments with other departments in the region</td>
<td>Town Wide</td>
<td>Fire, EMS, Police</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>All Hazard Mitigation Plan (2005)</td>
<td>Addresses all potential natural hazards and provides strategies and an Implementation Plan to accomplish mitigation tasks.</td>
<td>Town Wide</td>
<td>EMD</td>
<td>Good</td>
<td>Being updated with this Plan</td>
</tr>
<tr>
<td>Emergency Operations Plan</td>
<td>This plan offers all members of the emergency management team a better understanding of procedures in case of a disaster. Plan does not currently address 16 Emergency Support Functions (ESFs).</td>
<td>Town Wide</td>
<td>EMD</td>
<td>Good</td>
<td>Needs updating to 16 ESF Format</td>
</tr>
<tr>
<td>School Emergency Operations Plan</td>
<td>Required plan that Insures preparedness and response for school personnel and town emergency personnel in the instance of a major disaster at the school. Efforts are coordinated with the fire and police departments.</td>
<td>Schools</td>
<td>Superintendent of Schools</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>School Call System</td>
<td>Northumberland School System has an automated call system used to notify students, parents and teachers of school events, closings and emergencies.</td>
<td>Schools</td>
<td>Superintendent of Schools</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>Fire Horn</td>
<td>Makes announcements to the public in the instance of a large fire; can be heard in most of Town but does not operate effectively during sub-zero temperatures.</td>
<td>Groveton Village</td>
<td>Fire Department</td>
<td>Good</td>
<td>More education is needed to teach the community about this warning system</td>
</tr>
<tr>
<td>Existing Program or Activity</td>
<td>Description</td>
<td>Area of Town Covered</td>
<td>Office of Primary Responsibility</td>
<td>Effectiveness</td>
<td>Improvements or Changes Needed</td>
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</tr>
<tr>
<td>Site Plan Review (Last update 1994)</td>
<td>Ensures sound site utilization, balanced growth, and avoids development which may result in negative environments impacts; should be updated to reflect new recommendations for changes in Town.</td>
<td>Town Wide</td>
<td>Select &amp; Planning Boards</td>
<td>Good</td>
<td>Update Needed</td>
</tr>
<tr>
<td>Dam Inspection at Mill</td>
<td>Inspections are done every year.</td>
<td>Mill Dam</td>
<td>Groveton Acquisition</td>
<td>Good</td>
<td>None needed</td>
</tr>
<tr>
<td>Road Standards</td>
<td>Incorporated into Subdivision Regulations; all new roads must be built to town specs, so that they comply if they are ever to be turned over for the Town to maintain.</td>
<td>Town Wide</td>
<td>Planning Board</td>
<td>In Progress</td>
<td>In progress</td>
</tr>
<tr>
<td>Zoning Regulations</td>
<td>The regulations include a floodplain ordinance used with Subdivision Regulations to deal with planning and development issues in town.</td>
<td>Town Wide</td>
<td>Select &amp; Zoning Boards</td>
<td>Good</td>
<td>Needs improvement and to speed up process for obtaining cell towers</td>
</tr>
<tr>
<td>NFIP</td>
<td>National Flood Insurance Program; members since May 4, 1989.</td>
<td>Town Wide</td>
<td>Administrative Assistant</td>
<td>Good</td>
<td>Need to maintain sufficient supply to have available for homeowners and builders</td>
</tr>
<tr>
<td>NIMS &amp; ICS Training for Town Officials</td>
<td>Ensure effective command, control, and communications during emergencies; Town officials and emergency responders have undergone NIMS training.</td>
<td>Town Wide</td>
<td>EMD</td>
<td>Good</td>
<td>Need to insure Town Officials other than emergency responders are trained</td>
</tr>
</tbody>
</table>
Chapter VII: Prior Mitigation Plan(s)

A. Date(s) of Prior Plan(s)

Northumberland has participated in the development of a prior mitigation plan. The Hazard Mitigation Plan, 2005 was the first plan to be developed based on the Disaster Mitigation Act (DMA) of 2000. This Plan, the “Multi-Hazard Mitigation Plan Update, 2011, Northumberland, NH”, is the Town’s second hazard mitigation plan.

Below are the strategies that were identified in the 2005 Plan. The Team identified the current status of each strategy based on three questions:

- Has the strategy been completed?
- Has (or should) the strategy be deleted?
- Has (or should) the strategy be deferred for consideration in this Plan?

Table 7.1: Accomplishments since Prior Plan(s) Approval

<table>
<thead>
<tr>
<th>Hazard Type</th>
<th>Potential Program or Activity</th>
<th>Description of Potential Strategy</th>
<th>Affected Location</th>
<th>Type of Activity</th>
<th>Deleted, Completed or Deferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Hazards</td>
<td>Emergency Operation Plan</td>
<td>Develop an EOP that is the basis for a coordinated and effective response to any type of emergency or disaster that affects live and property in Northumberland. As such, it defines the roles, and responsibilities of Northumberland Town Government, private and volunteer organizations, and State and Federal agencies with the Town and county.</td>
<td>Town Wide</td>
<td>Prevention</td>
<td>Deferred</td>
</tr>
<tr>
<td>All Hazards</td>
<td>Rewire Groveton High School to emergency back-up generator</td>
<td>The town hopes to allocate $10,000 by town meeting to rewire the High School in order to provide emergency power in the instance of a sustained, town power outage.</td>
<td>Town Wide</td>
<td>Prevention</td>
<td>Deleted</td>
</tr>
<tr>
<td>Flooding</td>
<td>Roaring Brook Dam / Bridge Refurbishment</td>
<td>Continue to put money from the federal government in to the capital reserve for a new bridge.</td>
<td>Brooklyn Street Area</td>
<td>Prevention Structural Property Protection</td>
<td>Deferred</td>
</tr>
<tr>
<td>Hazard Type</td>
<td>Potential Program or Activity</td>
<td>Description of Potential Strategy</td>
<td>Affected Location</td>
<td>Type of Activity</td>
<td>Deleted, Completed or Deferred</td>
</tr>
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</tr>
<tr>
<td>Flooding</td>
<td>River Bank Restoration</td>
<td>Explore the costs associated with reinforcing the river bank around the area of Perras Lumber in order to diminish erosion.</td>
<td>Perras Lumber Company area along CT River</td>
<td>Prevention Structural</td>
<td>Completed</td>
</tr>
<tr>
<td>Flooding</td>
<td>Repair dip on Old Village Road</td>
<td>The dip in the road often freezes, floods and causes a lot of accidents. The town hopes to allocate state funds to raise the road in order to prevent this site from causing more accidents.</td>
<td>End of Stonewall near town reservoir on Village Road</td>
<td>Prevention Structural</td>
<td>Deferred</td>
</tr>
<tr>
<td>All Hazards</td>
<td>Hazmat Training for Emergency Personnel</td>
<td>Educate / train fire, emergency personnel, and police units for better response.</td>
<td>Town Wide</td>
<td>Prevention Emergency Services</td>
<td>Annually</td>
</tr>
<tr>
<td>All Hazards</td>
<td>Build an Emergency Operations Center</td>
<td>The town currently does not have a facility where emergency personnel can train, coordinate, or store emergency equipment in. The new building will provide this and possibly serve as another emergency shelter.</td>
<td>Town Wide</td>
<td>Emergency Services Prevention</td>
<td>Completed</td>
</tr>
<tr>
<td>All Hazards</td>
<td>Coordinated Drills Between All Emergency Personnel</td>
<td>The committee felt it was important that emergency responders conduct evacuation drills, and situational drills for the instance of a major hazard disaster occurring. People will know how to respond more efficiently.</td>
<td>Town Wide</td>
<td>Structural Project</td>
<td>Annually</td>
</tr>
<tr>
<td>Man-Made</td>
<td>Emergency Personnel Training for a Natural Gas Leak</td>
<td>Provide specialized/coordinated training to emergency personnel for the instance of a natural gas / petroleum spill along the natural gas lines.</td>
<td>Northumberland Natural Gas Lines</td>
<td>Emergency Services</td>
<td>Annually</td>
</tr>
<tr>
<td>All Hazards</td>
<td>Emergency Brochure</td>
<td>Prepare an information brochure that would go out to all residents for information on resources such as where to go, and what to do in case of a disaster. The brochure would also provide public awareness about the alarm / horn system signals.</td>
<td>Town Wide</td>
<td>Prevention Public Information</td>
<td>Deferred</td>
</tr>
<tr>
<td>Man-Made</td>
<td>Build Security Fences around Wellheads, Petroleum Pump Houses and Pipes</td>
<td>Currently, there is no security around petroleum pump house, pipes and town wellheads. The committee feels that the construction of fences around these areas will deter human tampering.</td>
<td>Town Wide</td>
<td>Property Protection</td>
<td>Completed; however more could be done</td>
</tr>
<tr>
<td>All Hazards</td>
<td>Communications Improvement</td>
<td>Acquire emergency backup radios for emergency personnel through various state and federal grants.</td>
<td>Town Wide</td>
<td>Emergency Services</td>
<td>Completed</td>
</tr>
</tbody>
</table>
Chapter VIII: New Mitigation Strategies & STAPLEE

A. Feasibility and Prioritization

Table 8.1 reflects the newly identified potential multi-hazard and wildfire mitigation strategies as well as the results of the STAPLEE Evaluation as explained below. It should also be noted that although some areas are identified as "Multi-Hazard", many of these would apply indirectly to wildfire response and capabilities. Many of these potential mitigation strategies overlap.

The goal of each proposed mitigation strategy is reduction or prevention of damage from a hazardous event. To determine their effectiveness in accomplishing this goal, a set of criteria that was developed by FEMA, was applied to each proposed 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 discussed in Table 8.1.

Social: .................Is the proposed strategy socially acceptable to the community? Is there an equity issue involved that would result in one segment of the community being 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 it need environmental regulatory approvals?

Each proposed mitigation strategy was then evaluated and assigned a score based on the above criteria. Each of the STAPLEE categories was discussed and was awarded the following scores:

Good...........................................3
Average......................................2
Poor...........................................1
An evaluation chart with total scores for each new strategy is shown in Table 8.1.

The ranking of strategies with the scores displayed in the following pages was merely a guideline for further prioritizing. The Team then prioritized the strategies and prepared the action plan using additional criteria:

- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Can the action be implemented quickly?

The prioritization exercise helped the committee seriously evaluate the new hazard mitigation strategies that they had brainstormed throughout the hazard mitigation planning process. While all actions would help improve the Town’s hazard responsiveness capability, funding availability will be a driving factor in determining what and when new mitigation strategies are implemented.

**B. The Team’s Understanding of Multi-Hazard Mitigation Strategies**

The Team determined that any strategy designed to reduce personal injury or damage to property that could be done prior to an actual disaster would be listed as a potential mitigation strategy. This decision was made even though not all projects listed in Tables 8.1 and 9.1 (Implementation Table) are fundable under FEMA pre-mitigation guidelines. The Team determined that this Plan was in large part a management document designed to assist the Select Board and other town officials in all aspects of managing and tracking potential emergency planning strategies. For instance, the Team was aware that some of these strategies are more properly identified as preparedness issues. The Team did not want to “lose” any of the ideas discussed during these planning sessions and thought this method was the best way to achieve that objective.
Table 8.1: Potential Mitigation Strategies & STAPLEE

<table>
<thead>
<tr>
<th>New Mitigation Project</th>
<th>Type of Hazard</th>
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<tbody>
<tr>
<td>(1) Develop a warning system for the blast horn and educate the public about the blast horn's code system perhaps through Town's website. (Table 6.1)</td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Education &amp; Awareness</td>
<td>3</td>
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<tr>
<td>(2) Mail or distribute &quot;courtesy notifications&quot; to resources that are mentioned in this plan as determined by the EMD.</td>
<td>Multi-Hazard</td>
<td>Town Wide Resources</td>
<td>Emergency Preparedness</td>
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<td>(3) Create and disseminate notification to residents on Class VI and Private roads regarding FEMA's policy on pre- and post-hazardous event funding perhaps through an emergency page on the Town's website.</td>
<td>Multi-Hazard</td>
<td>Class VI &amp; Private Roads</td>
<td>Education &amp; Awareness</td>
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<td>(4) Obtain and have available &quot;Firewise&quot; brochures to educate homeowners on methods to reduce fire risk around their homes.</td>
<td>Wildfire</td>
<td>Town Wide</td>
<td>Education &amp; Awareness</td>
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<td>(5) Obtain a supply of NFIP brochures to have available in the Town Offices and to give to homeowners and builders when proposing new development or substantial improvements; inform property owners about the availability of flood insurance for all properties in town, whether or not they are in the flood zone.</td>
<td>Flooding</td>
<td>Town Wide</td>
<td>Education &amp; Awareness</td>
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<td>(6) Educate homeowners regarding the risks of building in flood zone and measures that can be taken to reduce the chance of flooding, perhaps through Town’s website.</td>
<td>Flooding</td>
<td>Town Wide</td>
<td>Prevention</td>
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<td>(7) Assess culvert capacity in Town and seek funding to replace undersized or overwhelmed culverts.</td>
<td>Flooding</td>
<td>Town Wide</td>
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<td>(8) Assess ditch capacity in Town and seek funding to repair ditches that are not adequately directing the flow of rain water and snow melt.</td>
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<td>(9) Perform storm water drainage assessment and maintenance to keep water flow at proper levels.</td>
<td>Flooding &amp; Erosion</td>
<td>Town Wide</td>
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<td>(10) Meet federal regulations for Communications Equipment for fire, police and highway departments.</td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Communications</td>
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<td>Requires grant funding</td>
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<td>(11) Acquire generators for new Town Offices estimated to be built and completed in 2015.</td>
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<td>Town Hall</td>
<td>Emergency Preparedness</td>
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<td>Budget constraints</td>
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<td>(12) Advise residents who live on private roads of the importance of maintaining their roads for first responders, particularly for fire equipment perhaps through emergency webpage on Town's website.</td>
<td>Multi-Hazard</td>
<td>Class VI &amp; Private Roads</td>
<td>Prevention</td>
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<td>(13) Maintain program to cut tree and limbs near power lines in an effort to lessen the impact of high wind events and power outages.</td>
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<td>Town Wide</td>
<td>Prevention</td>
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<td>(14) Review E-911 system to determine compliance with regards to signage and community participation, perhaps through the Town's website.</td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Education &amp; Awareness</td>
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<td>(15) Join NH Municipal Mutual Aid for Public Works and consider.</td>
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<td>Emergency Preparedness</td>
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<td>(16) Develop an Emergency Operations Plan that is the basis for a coordinated and</td>
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<td>Town Wide</td>
<td>Emergency Preparedness</td>
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<td>effective response to any type of emergency or disaster that affects life and</td>
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<td>property in Northumberland. (2005 Plan)</td>
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<td>(17) Continue to put money from the State of New Hampshire into the capital reserve</td>
<td>Multi-Hazard</td>
<td>Roaring Brook Dam</td>
<td>Prevention</td>
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<td>for a new bridge. Roaring Brook Dam/Bridge Refurbishment; Brooklyn Street Area. (2005</td>
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<td>(18) Repair dip on Old Village Road by allocating state funds to raise the road</td>
<td>Flooding</td>
<td>End of Stonewall near town reservoir on Village Road</td>
<td>Prevention</td>
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<td>in order to prevent continued damage and vehicular accidents; dip in the road</td>
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<td>often freezes, floods &amp; causes accidents. (2005 Plan)</td>
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<td>(19) Provide Hazmat Training for Emergency Personnel; Educate &amp; train fire,</td>
<td>Hazardous</td>
<td>Town Wide</td>
<td>Emergency Preparedness</td>
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<td>emergency personnel, fire, emergency personnel, fire, and police units for better</td>
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<td>(20) Provide coordinated drills between all emergency personnel; the committee felt</td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Emergency Preparedness</td>
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<td>it was important that emergency responders conduct evacuation drills and situational</td>
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<td>drills simulating the events major hazard disasters. (2005 Plan)</td>
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<td>(21) Provide Emergency Responders with training to prepare for a natural gas leak or petroleum spill. <em>(2005 Plan)</em></td>
<td>Hazardous Materials</td>
<td>Northumberland Natural Gas Lines</td>
<td>Emergency Preparedness</td>
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<tr>
<td>(22) Prepare an emergency information brochure that would go out to all residents for information on available resources such and where to go and what to do in case of an emergency. The brochure would also provide public awareness about the alarm/horn system signals and work in conjunction with the Town's website. <em>(2005 Plan)</em></td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Education &amp; Awareness</td>
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<td>(23) Build Security Fences around Wellheads, Petroleum Pump Houses and Pipes; currently, there is no security around petroleum pump house, pipes and town wellheads to deter human tampering; partially completed since prior Plan however more could be done. <em>(2005 Plan)</em></td>
<td>Multi-Hazard</td>
<td>Wellheads, Petroleum Pump Houses &amp; Pipes</td>
<td>Prevention</td>
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<td>(24) Obtain grant funding to stabilize the bank on the Connecticut River to prevent further erosion at the Northumberland Public Cemetery.</td>
<td>Erosion, Mudslide &amp; Landslide</td>
<td>Northumberland Natural Gas Lines</td>
<td>Prevention</td>
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<td>(25) Designate the Town Office meeting room as a cooling and warming; extend pool</td>
<td>Extreme Temperatures</td>
<td>Town Offices</td>
<td>Prevention</td>
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<td>(26) Increase Police Patrols to lessen incidence of crime and consider the</td>
<td>Violent Crime</td>
<td>Town Wide</td>
<td>Prevention</td>
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<td>development of a Neighborhood Watch Committee.</td>
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<td>(27) Complete the construction of the Town’s new website and include an emergency</td>
<td>Multi-Hazard</td>
<td>Town Offices</td>
<td>Education &amp;</td>
<td>3</td>
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<td>(28) NIMS &amp; ICS Training for Town Officials. (Table 6.1)</td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Education &amp;</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>(29) Revisit Road Standards, Site Plan &amp; Zoning Regulations (to speed up process for</td>
<td>Multi-Hazard</td>
<td>Town Wide</td>
<td>Town Planning</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>obtaining cell towers) Review. (Table 6.1)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Chapter IX: Implementation Schedule for Prioritized Strategies

After reviewing the finalized STAPLEE numerical ratings, the Team prepared to develop the Implementation Plan (Table 9.1). To do this, team members created four categories into which they would place all the potential mitigation strategies.

- **Category 1** was to include those items under the direct control of town officials, within the financial capability of the Town using only town funding, those already being done or planned, and those that could generally be completed within one year.

- **Category 2** was to include those items that the Town did not have sole authority to act upon, those for which funding might be beyond the Town’s capability, and those that would generally take between 13—24 months.

- **Category 3** was to include those items that would take a major funding effort, those that the Town had little control over the final decision, and those that would take in excess of 24 months to complete.

Each potential mitigation strategy was placed in one of the three categories and then those strategies were prioritized within each category.

Once this was completed, the Team developed an implementation plan that outlined who is responsible for implementing each strategy, as well as when and how the actions will be implemented. The following questions were asked in order to develop an implementation schedule for the identified priority mitigation strategies.

- **WHO?** Who will lead the implementation efforts? Who will put together funding requests and applications?

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

- **HOW?** How will the community fund these projects? How will the community implement these projects? What resources will be needed to implement these projects?

In addition to the prioritized mitigation projects, Table 9.1, Implementation Plan, includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN).

Some projects, including most training and education of residents on emergency and evacuation procedures, could be tied into the emergency operation plan and implemented through that planning effort.
<table>
<thead>
<tr>
<th>Rank</th>
<th>New Mitigation Project</th>
<th>Responsibility and/or Oversight</th>
<th>Funding and/or Support</th>
<th>Timeframe</th>
<th>STAPLEE Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 1</td>
<td>(16) Develop an Emergency Operations Plan that is the basis for a coordinated and effective response to any type of emergency or disaster that affects life and property in Northumberland. (2005 Plan)</td>
<td>EMD</td>
<td>Local &amp; Grants</td>
<td>02/12/12</td>
<td>21</td>
</tr>
<tr>
<td>1 - 2</td>
<td>(27) Complete the construction of the Town's new website and include an emergency page.</td>
<td>Select Board</td>
<td>Local</td>
<td>12/31/11</td>
<td>21</td>
</tr>
<tr>
<td>1 - 3</td>
<td>(15) Join NH Municipal Mutual Aid for Public Works.</td>
<td>Road Agent</td>
<td>Local</td>
<td>06/01/11</td>
<td>21</td>
</tr>
<tr>
<td>1 - 4</td>
<td>(9) Perform storm water drainage assessment and maintenance to keep water flow at proper levels.</td>
<td>Road Agent</td>
<td>Local &amp; Grants</td>
<td>Annually</td>
<td>21</td>
</tr>
<tr>
<td>1 - 5</td>
<td>(13) Maintain program to cut tree and limbs near power lines in an effort to lessen the impact of high wind events and power outages.</td>
<td>Road Agent</td>
<td>Local</td>
<td>Annually</td>
<td>20</td>
</tr>
<tr>
<td>1 - 6</td>
<td>(28) NIMS &amp; ICS Training for Town Officials. (Table 6.1)</td>
<td>EMD</td>
<td>Local</td>
<td>Annually</td>
<td>21</td>
</tr>
<tr>
<td>1 - 7</td>
<td>(19) Provide Hazmat Training for Emergency Personnel; Educate &amp; train fire, emergency personnel, fire, and police units for better response. (2005 Plan)</td>
<td>Fire Department; EMS; Police Department; EMD</td>
<td>Local &amp; Grants</td>
<td>Annually</td>
<td>21</td>
</tr>
<tr>
<td>1 - 8</td>
<td>(20) Provide coordinated drills between all emergency personnel; the committee felt it was important that emergency responders conduct evacuation drills and situational drills simulating the events major hazard disasters. (2005 Plan)</td>
<td>Fire Department; EMS; Police Department; EMD</td>
<td>Local &amp; Grants</td>
<td>Annually</td>
<td>21</td>
</tr>
<tr>
<td>1 - 9</td>
<td>(25) Designate the Town Office meeting room as a cooling and warming; extend pool hours.</td>
<td>Select Board &amp; EMD</td>
<td>Local</td>
<td>06/30/11</td>
<td>19</td>
</tr>
<tr>
<td>1 - 10</td>
<td>(4) Obtain and have available “Firewise” brochures to educate homeowners on methods to reduce fire risk around their homes.</td>
<td>Administrative Assistant</td>
<td>Local</td>
<td>09/30/11</td>
<td>21</td>
</tr>
<tr>
<td>1 - 11</td>
<td>(5) Obtain a supply of NFIP brochures to have available in the Town Offices and to give to homeowners and builders when proposing new development or substantial improvements; inform property owners about the availability of flood insurance for all properties in town, whether or not they are in the flood zone.</td>
<td>Administrative Assistant</td>
<td>Local</td>
<td>09/30/11</td>
<td>21</td>
</tr>
<tr>
<td>Rank</td>
<td>New Mitigation Project</td>
<td>Responsibility and/or Oversight</td>
<td>Funding and/or Support</td>
<td>Timeframe</td>
<td>STAPLEE Total</td>
</tr>
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<td>--------------------------------</td>
<td>------------------------</td>
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</tr>
<tr>
<td>1 - 12</td>
<td>(29) Revisit Road Standards, Site Plan &amp; Zoning Regulations (to speed up process for obtaining cell towers). (Table 6.1)</td>
<td>Select, Planning &amp; Zoning Boards</td>
<td>Local</td>
<td>Annually</td>
<td>21</td>
</tr>
<tr>
<td>2 - 1</td>
<td>(2) Mail or distribute &quot;courtesy notifications&quot; to resources that are mentioned in this plan as determined by the EMD.</td>
<td>EMD</td>
<td>Local</td>
<td>03/13/13</td>
<td>20</td>
</tr>
<tr>
<td>2 - 2</td>
<td>(26) Increase Police Patrols to lessen incidence of crime and consider the development of a Neighborhood Watch Committee.</td>
<td>Police Chief</td>
<td>Local</td>
<td>05/31/12</td>
<td>19</td>
</tr>
<tr>
<td>2 - 3</td>
<td>(7) Assess culvert capacity in Town and seek funding to replace undersized or overwhelmed culverts.</td>
<td>Road Agent</td>
<td>Local &amp; Grants</td>
<td>07/31/12</td>
<td>18</td>
</tr>
<tr>
<td>2 - 4</td>
<td>(8) Assess ditch capacity in Town and seek funding to repair ditches that are not adequately directing the flow of rainwater and snow melt.</td>
<td>Road Agent</td>
<td>Local &amp; Grants</td>
<td>07/31/12</td>
<td>18</td>
</tr>
<tr>
<td>2 - 5</td>
<td>(24) Obtain grant funding to stabilize the bank on the Connecticut River to prevent further erosion at the Northumberland Public Cemetery.</td>
<td>Cemetery Trustees; Select Board; Administrative Assistant</td>
<td>Local &amp; Grants</td>
<td>11/12/12</td>
<td>20</td>
</tr>
<tr>
<td>2 - 6</td>
<td>(23) Build Security Fences around Wellheads, Petroleum Pump Houses and Pipes; currently, there is no security around petroleum pump house, pipes and town wellheads to deter human tampering; partially completed since prior Plan however more could be done. (2005 Plan)</td>
<td>Water Superintendent</td>
<td>Local &amp; Grants</td>
<td>03/31/13</td>
<td>20</td>
</tr>
<tr>
<td>2 - 7</td>
<td>(10) Meet federal regulations for Communications Equipment for fire, police and highway departments.</td>
<td>EMD</td>
<td>Local &amp; Grants</td>
<td>01/01/13</td>
<td>20</td>
</tr>
<tr>
<td>2 - 8</td>
<td>(1) Develop a warning system for the blast horn and educate the public about the blast horn's code system perhaps through Town's website. (Table 6.1)</td>
<td>EMD</td>
<td>Local</td>
<td>03/31/13</td>
<td>19</td>
</tr>
<tr>
<td>2 - 9</td>
<td>(21) Provide Emergency Responders with training to prepare for a natural gas leak or petroleum spill. (2005 Plan)</td>
<td>Fire Department</td>
<td>Local &amp; Grants</td>
<td>06/30/12</td>
<td>21</td>
</tr>
<tr>
<td>2 - 10</td>
<td>(14) Review E-911 system to determine compliance with regards to signage and community participation, perhaps through the Town's website.</td>
<td>EMS</td>
<td>Local</td>
<td>03/13/12</td>
<td>21</td>
</tr>
<tr>
<td>Rank</td>
<td>New Mitigation Project</td>
<td>Responsibility and/or Oversight</td>
<td>Funding and/or Support</td>
<td>Timeframe</td>
<td>STAPLEE Total</td>
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<tr>
<td>2 - 11</td>
<td>Prepare an emergency information brochure that would go out to all residents for information on available resources such and where to go and what to do in case of an emergency. The brochure would also provide public awareness about the alarm/horn system signals and work in conjunction with the Town's website. (2005 Plan)</td>
<td>Administrative Assistant &amp; EMD</td>
<td>Local</td>
<td>03/31/13</td>
<td>20</td>
</tr>
<tr>
<td>2 - 12</td>
<td>Advise residents who live on private roads of the importance of maintaining their roads for first responders, particularly for fire equipment perhaps through emergency webpage on Town's website</td>
<td>Administrative Assistant &amp; EMD</td>
<td>Local</td>
<td>05/31/12</td>
<td>21</td>
</tr>
<tr>
<td>2 - 13</td>
<td>Continue to put money from the State of New Hampshire into the capital reserve for a new bridge. Roaring Brook Dam/Bridge Refurbishment; Brooklyn Street Area. (2005 Plan)</td>
<td>Board of Selectmen</td>
<td>Local &amp; Grants</td>
<td>12/12/12</td>
<td>19</td>
</tr>
<tr>
<td>3 - 1</td>
<td>Repair dip on Old Village Road by allocating state funds to raise the road in order to prevent continued damage and vehicular accidents; dip in the road often freezes, floods &amp; causes accidents. (2005 Plan)</td>
<td>Road Agent</td>
<td>Local &amp; Grants</td>
<td>10/13/13</td>
<td>19</td>
</tr>
<tr>
<td>3 - 2</td>
<td>Create and disseminate notification to residents on Class VI and Private roads regarding FEMA's policy on pre- and post-hazardous event funding perhaps through an emergency page on the Town's website.</td>
<td>Administrative Assistant &amp; EMD</td>
<td>Local</td>
<td>04/01/14</td>
<td>21</td>
</tr>
<tr>
<td>3 - 3</td>
<td>Educate homeowners regarding the risks of building in flood zone and measures that can be taken to reduce the chance of flooding, perhaps through Town's website.</td>
<td>Administrative Assistant &amp; EMD</td>
<td>Local</td>
<td>04/01/14</td>
<td>21</td>
</tr>
<tr>
<td>3 - 4</td>
<td>Acquire generators for new Town Offices estimated to be built and completed in 2015.</td>
<td>EMD</td>
<td>Local &amp; Grants</td>
<td>05/15/15</td>
<td>19</td>
</tr>
</tbody>
</table>
Chapter X: Monitoring, Evaluation and Updating the Plan

A. Introduction

A good mitigation plan must allow for updates where and when necessary, particularly since communities may suffer budget cuts or experience personnel turnover during both the planning and implementation states. A good plan will incorporate periodic monitoring and evaluation mechanisms to allow for review of successes and failures or even just simple updates.

B. Multi-Hazard Plan Monitoring, Evaluation and Updates

To track programs and update the mitigation strategies identified through this process, the Town will review the multi-hazard mitigation plan annually or after a hazard event. Additionally, the Plan will undergo a formal review and update at least every five years and obtain FEMA approval for this update or any other major changes done in the Plan at any time. The Emergency Management Director is responsible for initiating the review and will consult with members of the multi-hazard mitigation planning team identified in this plan. The public will be encouraged to participate in any updates. Public announcements will be made through advertisements in local papers, postings on the town website, and posters disseminated in town. A formal public hearing will be held before reviews and updates are official.

Changes will be made to the Plan to accommodate projects that have failed or are not considered feasible after a review for their consistency with STAPLEE, the timeframe, the community’s priorities or funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, will be reviewed as well during the monitoring and update of the plan to determine feasibility of future implementation. In keeping with the process of adopting this multi-hazard mitigation plan, a public hearing to receive public comment on plan maintenance and updating will be held during the annual review period and before the final product is adopted by the Select Board. Chapter XI contains a representation of a draft resolution for Northumberland to use once a conditional approval is received from FEMA.

Prior to initiating this process, Northumberland entered into a Memorandum of Understanding (MOU) stating that they would follow up on this process and ensure that the funds necessary for certain mitigation strategies were addressed.

C. Integration with Other Plans

This multi-hazard plan will only enhance mitigation if balanced with all other town plans. Northumberland has completed a prior plan (Chapter 7) and will take the necessary steps to incorporate the mitigation strategies and other information contained in this plan with other town activities, plans and mechanisms, when appropriate. The local governments will modify other plans and actions as necessary to incorporate hazard issues such as incorporating parts of this Plan into the new Northumberland Emergency Operations Plan; the Select Board ensures this process will be followed in the future. In addition, the Town will review and make note of instances when this has been done and include it as part of their annual review of the Plan.
Chapter XI: Signed Community Documents and Approval Letters

A. Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING
MULTI-HAZARD MITIGATION PLANNING

Parties to the Agreement

- The Town of Northumberland, NH
- North Country Council, Inc.

This agreement, by and between the Select Board of Northumberland (hereinafter referred to as the “Town”) and North Country Council (hereinafter referred to as “NCC”) whereas the Town’s wish to engage the services of NCC to assist in planning and technical services in order to produce the 2011 Multi-Hazard Mitigation Plan Update (hereinafter referred to as the “Plan”). NCC is a regional planning commission operating under the enabling authority of RSA 36:45 and offers local assistance for planning and technical services as one of the primary objectives of its mission.

I. Intent of the Plan

As part of the Multi-Hazard Mitigation Plan Program, this Memorandum of Understanding (MOU) will be executed between the Town and North Country Council, the region’s planning organization. The Plan created as a result of this MOU will be presented to the Planning Board and/or Selectmen for adoption.

When adopted, the Plan provides guidance to the Town, commissions, and departments. Adopted plans serve as a guide and do not include a specific financial commitment by the Town. All adopted plans should address mitigation strategies for reducing the risk of natural, man-made, and wildfire disasters on life and property within the Town.

The intent of this MOU is to ensure that the mitigation plans are developed in an open manner involving community stakeholders, federal and state organizations whose mission is to prepare and respond to emergencies and wildfires in the region and local officials. It is also the intent of this MOU that it is consistent with Town policies, that it is an accurate reflection of the community values, and that it is integrated within other community planning initiatives. Its purpose is to form a working relationship between citizens of the Town’s planning team for the development of the Multi-Hazard Mitigation Plan.

This MOU sets out the responsibilities of all parties. It identifies the work to be performed by the planning team and the community. Specific tasks, schedules and finished products are identified within the Plan.

Now, therefore, for and in consideration of the mutual covenants, conditions and agreements contained herein and for good and valuable consideration, the parties agree to the following:

II. Scope of Work and Responsibilities

A. THE TOWN’S MULTI-HAZARD MITIGATION PLANNING TEAM RESPONSIBILITIES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

- Ensure that the planning team includes representatives such as community stakeholders, the local Emergency Management Director, the local Fire and Police Chief(s), representatives from the federal and state organizations whose mission is to prepare and respond to all natural and man-made emergencies and wildfires in the region, local officials, property owners, and relevant businesses or organizations.
- Determine a planning coordinator that will be the lead contact to the North Country Council.
- Offer assistance to the North Country Council in developing the work program which will produce the Multi-Hazard Mitigation Plan.
- Organize regular meetings for the planning team in coordination with North Country Council.
- Assist North Country Council with organizing public meetings to develop the plan.
- Identify the community resources available to support the planning effort, including people who will have access to and can provide pertinent data. Examples include, but are not limited to, town team members, such as the Fire or Police Chief or Road Agent, who are able to identify historic wildfires and past hazardous situations and research existing town planning documents to identify existing mitigation strategies in hazard and wildfire areas.
- Assist with recruiting participants for planning meetings, including the development of mailing lists when and if necessary, distribution of flyers, and placement of meeting announcements in the community.
- Gain the support of stakeholders for the recommendations found within the plan.
- Provide public notice for meetings to keep the Town informed and offer opportunity for their review at various stages of the planning process, as required by FEMA.
- Forward local information to North Country Council such as anecdotal information from the community to be incorporated into the proposed plan.
- Submit the proposed plan to the Town’ Planning Board and/or Select Board for consideration and adoption.
- After adoption of the Multi-Hazard Mitigation Plan, the Town will:
  - Develop a team to monitor and work toward plan implementation.
  - Publicize the Plan to the Town and ensure community members are aware of the Plan and its contents.
  - Urge the Planning Board to incorporate those priority projects found most important into the community’s Capital Improvement Plan (if available).
  - Integrate mitigation strategies and priorities for all these plans into other town plans.

**B. NORTH COUNTRY COUNCIL’S RESPONSIBILITIES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:**

- Collect data necessary to complete the Plan in a comprehensive manner.
- Coordinate and facilitate community meetings with the assistance of the local planning committee.
- Provide any materials, handouts, displays, and tools necessary for the public to fully understand the planning process.
- Work with the planning team to collect and analyze data. Take public input from community members and ensure that this input becomes part of the Plan.
- Facilitate the development of goals and objectives and implementation strategies for the Plan.
- Coordinate with other federal, state and local agencies throughout the process. Ensure that a collaborative environment is created with all interested parties.
- Assist the planning team with presentation of the Plan to the town Planning Board and/or Select Board.
- Assist the planning team with their understanding of future Plan monitoring, educating the public and incorporating the plan with the Town’s Capital Improvement Plan (if available).
- Delineate the community’s Wildland Urban Interface (WUI) zone for the Plan.
- Create a Multi-Hazard Threat Analysis that outlines the severity of hazard risk throughout the communities.
- Write, edit and prepare the Plan for review and final publication.
- Ensure that the Plan receives approval from FEMA and New Hampshire Homeland Security & Emergency Management (HSEM).

**III. Terms**

- **Project Period:** This Agreement shall commence upon execution by both parties and continue through October 2011. The project period may be extended by mutual agreement by the Town and NCC.
- **Work Products:** NCC will provide a final copy of the Multi-Hazard Mitigation Plan, containing all signed documents, approvals and GIS maps along with a CD at the completion of the Plan and after Final Approval is received from FEMA.
- **Ownership of Material:** All materials, maps, reports, documents and other work products shall be owned by NCC and the Town and each party may retain file copies of any and all information generated for their own use. NCC shall have the right to use such reports and data collected in the normal operation of business. NCC shall not use any data in such a way as to reveal information about individuals or groups which should reasonably be considered confidential.
- **Office Space and Supplies:** NCC shall provide, at its office, all supplies and space necessary to complete the Town’s Multi-Hazard Mitigation Plan.
- **Project Match:** NCC shall provide necessary documentation to HSEM regarding the in-kind match for this project. The NCC planner will require meeting attendees to “sign-in” at all meetings and requests that time spent outside of meetings be logged to help fulfill the match requirement.
• **Termination:** This Agreement may be terminated for cause or for mutual convenience if the parties so agree. Such termination shall take place thirty (30) days after written notice of the termination agreement. In the event of termination, NCC shall assemble all information prepared under this Agreement to date and shall forward it to the Town. NCC shall be entitled to recover its costs for work completed.

• **Limit of Liability:** NCC agrees to execute the work diligently according to the terms of this Agreement using properly trained personnel. The fulfillment of NCC’s responsibilities under this Agreement depends upon the full cooperation of the Town. NCC and its employees shall not be liable for opinions rendered or for errors resulting from the quality of data supplied to it upon which any opinion or advice was based.

• **Arbitration:** In case of dispute between the parties arising out of this Agreement, which cannot be settled between the parties, an arbitrator shall be appointed by the municipal law section of the NH/Vermont Bar Association. The parties shall divide the cost of such arbitration equally between them and are bound by the arbitrator’s decision.

• **Amendment:** This Agreement may be amended or modified by a written amendment signed by both the Town and NCC. Any correspondence whether a written amendment or other correspondence between the parties shall be addressed to those below:

**North Country Council, Inc.**
June Garneau, GIS Planner
North Country Council, Inc.
107 Glessner Road
Bethlehem, NH 03574
(603) 444-6303, extension 13

**Contact for the Town of Northumberland**
Rob Gauthier
Select Board Member & Emergency Management Director
3 State Street
Groveton, NH 03582
(603) 636-0049

**Entire Agreement:** This Agreement, which shall be executed in two (2) counterparts, constitutes the entire Agreement and understanding between the parties and supersedes all prior agreements and understandings relating hereto.
B. Conditional Approval Letter from FEMA

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FOR INSERTION OF
CONDITIONAL APPROVAL
LETTER FROM FEMA
WHEN RECEIVED
C. Signed Certificate of Adoption
(Note: to be replaced with signed copy upon completion)

CERTIFICATE OF ADOPTION

Town of Northumberland, New Hampshire
Board of Selectmen
A Resolution Adopting the Northumberland Multi-Hazard Mitigation Plan

Plan Dated: ____________
Conditionally Approved: ____________

WHEREAS, the Town of Northumberland received funding from the NH Office of Homeland Security and Emergency Management under a Flood Mitigation Assistance Project Grant and assistance from North Country Council in the preparation of the Northumberland Multi-Hazard Mitigation Plan; and

WHEREAS, several public planning meetings were held between September 30, 2010 and April 28, 2011 regarding the development and review of the Northumberland Multi-Hazard Mitigation Plan; and

WHEREAS, the Northumberland Multi-Hazard Mitigation Plan contains several potential future projects to mitigate hazard damage in the Town of Northumberland; and

WHEREAS, a duly-noticed public meeting was held by the Northumberland Board of Selectmen on ____________ to formally approve and adopt the Northumberland Multi-Hazards Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Northumberland Board of Selectmen adopts the Northumberland Multi-Hazard Mitigation Plan.

ADOPTED AND SIGNED this day of ____________, 2011

______________________________
Northumberland Board of Selectmen Chair

______________________________
Town Seal or Notary

______________________________
Date______________________, 2011
D. Final Approval Letter from FEMA

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FOR INSERTION OF FINAL APPROVAL LETTER FROM FEMA WHEN RECEIVED
Several public meetings and committee meetings were held between September 30, 2010 and April 28, 2011 regarding the development and review of the Northumberland Multi-Hazards Mitigation Plan. The Northumberland Multi-Hazards Mitigation Plan contains potential future projects to mitigate hazard and wildfire damage in the Town of Northumberland.

The Fire Chief along with the Select Board and EMD desire that this Plan and be accepted by the Department of Resources and Economic Development (DRED) as a Community Wildfire Protection Plan, having adhered to the requirements of said Plan.

The Select Board, EMD and the Northumberland Fire Chief approve the Northumberland Multi-Hazards Mitigation Plan and understand that with approval by DRED, this Plan will also serve as a Community Wildfire Protection Plan.

For the Town of Northumberland
APPROVED and SIGNED this day, ______________, 2011.

Chairman Select Board

Emergency Management Director

Fire Chief

For the Department of Resources and Economic Development
APPROVED and SIGNED this day, ______________, 2011.

Forest Ranger – NH Division of Forest and Lands, DRED

APPROVED and SIGNED this day, ______________, 2011.

Director – NH Division of Forest and Lands, DRED
Appendices

Appendix A: Bibliography

Appendix B: Alphabetical List of Hazard Definitions

Appendix C: Summary of Possible Multi-Hazard Mitigation Strategies

Appendix D: List of Contacts

Appendix E: Technical and Financial Assistance for Multi-Hazard Mitigation

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)

Appendix F: Wildfire Planning

- Wildfire Terminology
- Wildfire Funding

Appendix G: Acronyms
Appendix A: Bibliography

Documents

- Plans and Documents
  o Town of Northumberland, NH Hazard Mitigation Plan, 2005
  o Town of Northumberland, NH Master Plan, 2004
  o Town of Albany, NH Multi-Hazard Mitigation Plan, 2010
  o Town of Haverhill, NH Multi-Hazard Mitigation Plan, 2010
  o Town of Northumberland Zoning Ordinance, 1988/2007
- Natural Hazard Mitigation Plan, 2004, State Hazard Mitigation Goals
- NH Division of Forests and Lands Quarterly Update
- Disaster Mitigation Act (DMA) of 2000, Section 101, b1 & b2 and Section 322a
  o http://www.fema.gov/library/viewRecord.do?id=1935
- Healthy Forest Restoration Act; HR 1904, 2003; Section 101-3-a,b,c
- Census 2000 and Revenue Information, derived from this site; http://www.nh.gov/nhes/elmi/htmlprofiles/
- Photos
  o Photos taken from 2005 Hazard Mitigation Plan unless otherwise noted

Additional Websites

- US Forest Service; http://www.fs.fed.us
- US Fire Administration; http://www.usfa.dhs.gov/
- US Department of Agriculture Wildfire Programs: http://www.wildfireprograms.usda.gov/
- Firewise; http://www.firewise.org/
- The Disaster Center (NH); http://www.disastercenter.com/newhamp/tornado.html
- Floodsmart, about the NFIP; http://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp
- NOAA, Storm Prediction Center; http://www.spc.noaa.gov/faq/tornado/beaufort.html
- NOAA, Index/Heat Disorders; http://www.srh.noaa.gov/ssd/html/heatwv.htm
- National Weather Service; http://lwfc.nrdc.noaa.gov/oa/climate/conversion/windchill.html
- Center for Disease Control; http://emergency.cdc.gov/disasters/winter/pdf/cold_guide.pdf
- FEMA; http://www.fema.gov/hazard/hazmat/index.shtm
- FEMA; http://www.fema.gov/hazard/heat/index.shtm
- FEMA; http://www.fema.gov/hazard/terrorism/info.shtm
- Slate; http://www.slate.com/id/2092969/
- Home Pro Inspections; How Radon Enters a House; www.homeprocanada.ca/rdon/HP_radon.htm
- Code of Federal Regulations; Title 14, Aeronautics and Space; Part 1, Definitions and Abbreviations; http://ecfr.gpoaccess.gov
- Federal Aviation Administration; http://faa.custhelp.com
- US Legal, Inc.; http://definitions.uslegal.com/v/violent-crimes/
- The Disaster Center; selected years from http://www.disastercenter.com/crime/nhcrime.htm
Appendix B: Alphabetical List of Hazard Definitions

Note: Hazards identified in this Plan are indicated with an asterisk *Hazard

*Dam 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.

In the State of New Hampshire there are both structural dams and earthen dams.

*Drought

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects the growing season or living conditions of plants and animals. 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 drought 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 groundwater levels or increasing stream flow. Low stream flow also correlates with low groundwater levels because groundwater discharge to streams and rivers maintains stream flow during extended dry periods. Low stream flow and low groundwater levels commonly cause diminished water supply.

Earthquake

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 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.

*Epidemic/Pandemic

The CDC's official definition of an epidemic is: "The occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time." ⁹

*Erosion, Landslide & Mudslide

Erosion and Mudslides

Erosion is the process of wind and water wearing away soil. Typically in New Hampshire, the land along rivers is relatively heavily developed. Mudslides may form when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock.

Erosion and mudslides become significant threats to development during floods. Floods speed up the process of erosion and increase the risk of mudslides.

Landslide

A landslide is the downward or outward movement of slope-forming materials reacting under the force of gravity and includes: mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows. Landslides have damaged or destroyed roads, railroads, pipelines, electrical and telephone lines, mines, oil wells, buildings, canals, sewers, bridges, dams, seaports, airports, forests, parks and farms.

Expansive Soils

According to the USGS, expansive soils are soils that shrink or swell as the moisture content decreases or increases. Structures built on these soils may experience shifting, cracking, and breaking damage as soils shrink and subside or expand.

Soils freezing during winter and thawing in spring may result in some structural damage in New Hampshire, primarily in the form of foundation cracks and potholes on the state’s roads.

⁹ Slate; http://www.slate.com/id/2092969/
*Extended Power Failure*

Extended power failure as intended in this Plan is power failure that lasts for periods of one week or more. Power failure can be caused by many things: downed power lines (due to storm, wind, accident, etc.); failure of public utilities to operate or failure of the national grid. Extended power failure can present not only lighting difficulties but also heating, water supply and emergency services. Extended power failure is particularly hazardous in remote areas and for elderly populations.

*Extreme Temperatures*

**Extreme Heat**

A Heat Wave is a “Prolonged period of excessive heat, often combined with excessive humidity.” Heat kills by pushing the human body beyond its limits. In extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.

Most heat disorders occur because the victim has been overexposed to heat or has overexercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the “urban heat island effect.”

The chart above explains possible health conditions that may result from high heat.

**Extreme Cold**

What constitutes extreme cold and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered “extreme cold.” Whenever temperatures drop decidedly below normal and as wind speed increases, heat can leave your body more rapidly; these weather related conditions may lead to serious health problems. Extreme cold is a dangerous situation that can bring on health emergencies in susceptible people, without shelter or who are stranded, or who live in a home that is poorly insulated or without heat.

The National Weather Service Chart shows Wind Chill as a result of wind and temperature.
*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 anytime 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 flood will occur once every 100 years. 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 flood.” What this means is that there is a 1% chance of a flood of that size happening in any year.

**Rapid Snow Pack Melt**

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

**River Ice Jams**

Rising waters in early spring often breaks ice into chunks that float downstream and pile up, causing flooding behind them. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice in riverbeds and against structures presents a significant flooding threat 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.

*Hailstorm*

Hailstones are balls of ice that grow as they’re held up by winds, known as updrafts that blow upwards in thunderstorms. The updrafts carry droplets of super-cooled water – water at a below-freezing temperature that is not yet ice. The super cooled water droplets hit the balls of ice and freeze instantly, making the hailstones grow. The faster the updraft, the bigger the stones can grow. Most hailstones are smaller in diameter than a dime, but stones weighing more than a pound have been recorded. Details of how hailstones grow are complicated, but the results are irregular balls of ice that can be as large as baseballs, sometimes even bigger. While crops are the major victims, hail is also a hazard to vehicles and windows.

*Hazardous Material - Fixed Location and/or Transport (transportation accident)*

Chemicals are found everywhere; they purify drinking water, increase crop production, and simplify household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal. A community is at risk if a chemical is used unsafely or released in harmful amounts into the environment where you live, work, or play.

Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes routinely. These products are also shipped daily on the nation’s highways, railroads, waterways, and pipelines.

Chemical manufacturers are one source of hazardous materials, but there are many others, including service stations, hospitals, and hazardous materials waste sites. Varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States—from major industrial plants to local dry cleaning establishments or gardening supply stores.

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of chemical accidents in plants.14

14 FEMA; http://www.fema.gov/hazard/hazmat/index.shtm
**High Winds (windstorm)**

As stated by NOAA, wind is defined as “The horizontal motion of the air past a given point. Winds begin with differences in air pressures. Those pressures which are higher at one place than another place set up a force pushing from the high pressure toward the low pressure; the greater the difference in pressures, the stronger the force. The distance between the area of high pressure and the area of low pressure also determines how fast the moving air is accelerated. Meteorologists refer to the force that starts the wind flowing as the “pressure gradient force.” High and low pressures are relative. There’s no set number that divides high and low pressure. Wind is used to describe the prevailing direction from which the wind is blowing with the speed given usually in miles per hour or knots.” In addition, NOAA’s issuance of a Wind Advisory takes place when sustained winds reach 25 to 39 mph and/or gusts to 57 mph.

Below is the Beaufort Wind Scale, showing expected damage based on wind (knots), developed in 1805 by Sir Francis Beaufort of England, and posted on NOAA’s Storm Prediction Center website.

<table>
<thead>
<tr>
<th>Force</th>
<th>Wind (Knots)</th>
<th>WMO Classification</th>
<th>Appearance of Wind Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Less than 1</td>
<td>Calm</td>
<td>Sea surface smooth and mirror-like Calm, smoke rises vertically</td>
</tr>
<tr>
<td>1</td>
<td>1-3</td>
<td>Light Air</td>
<td>Scaly ripples, no foam crests Smoke drift indicates wind direction, still wind vanes</td>
</tr>
<tr>
<td>2</td>
<td>4-6</td>
<td>Light Breeze</td>
<td>Small wavelets, crests glassy, no breaking Wind felt on face, leaves rustle, vanes begin to move</td>
</tr>
<tr>
<td>3</td>
<td>7-10</td>
<td>Gentle Breeze</td>
<td>Large wavelets, crests begin to break, scattered whitecaps Leaves and small twigs constantly moving, light flags extended</td>
</tr>
<tr>
<td>4</td>
<td>11-16</td>
<td>Moderate Breeze</td>
<td>Small waves 1-4 ft. becoming longer, numerous whitecaps Dust, leaves, and loose paper lifted, small tree branches move</td>
</tr>
<tr>
<td>5</td>
<td>17-21</td>
<td>Fresh Breeze</td>
<td>Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray Small trees in leaf begin to sway</td>
</tr>
<tr>
<td>6</td>
<td>22-27</td>
<td>Strong Breeze</td>
<td>Larger waves 8-13 ft., whitecaps common, more spray Larger tree branches moving, whistling in wires</td>
</tr>
<tr>
<td>7</td>
<td>28-33</td>
<td>Near Gale</td>
<td>Sea heaps up, waves 13-20 ft., white foam streaks off breakers Whole trees moving, resistance felt walking against wind</td>
</tr>
<tr>
<td>8</td>
<td>34-40</td>
<td>Gale</td>
<td>Moderately high (13-20 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks Whole trees in motion, resistance felt walking against wind</td>
</tr>
<tr>
<td>9</td>
<td>41-47</td>
<td>Strong Gale</td>
<td>High waves (20 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility Slight structural damage occurs, slate blows off roofs</td>
</tr>
<tr>
<td>10</td>
<td>48-55</td>
<td>Storm</td>
<td>Very high waves (20-30 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility Seldom experienced on land, trees broken or uprooted, “considerable structural damage”</td>
</tr>
<tr>
<td>11</td>
<td>56-63</td>
<td>Violent Storm</td>
<td>Exceptionally high (30-45 ft.) waves, foam patches cover sea, visibility more reduced</td>
</tr>
<tr>
<td>12</td>
<td>64+</td>
<td>Hurricane</td>
<td>Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced</td>
</tr>
</tbody>
</table>


16 NOAA, Storm Prediction Center, [http://www.spc.noaa.gov/faq/tornado/beaufort.html](http://www.spc.noaa.gov/faq/tornado/beaufort.html)
**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 the storm may extend over 400 miles. High winds are a primary cause of hurricane-inflicted loss of life and property damage.

Flooding is often caused from the coastal storm surge of the ocean and torrential rains, both of which may accompany a hurricane; these floods can result in loss of lives and property.

**Land Subsidence**

As stated by USGS, “land subsidence is a gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials. Subsidence is a global problem and, in the United States, more than 17,000 square miles in 45 States, an area roughly the size of New Hampshire and Vermont combined, have been directly affected by subsidence.”

“The principal causes are aquifer-system compaction, drainage of organic soils, underground mining, hydro compaction, natural compaction, sinkholes, and thawing permafrost. More than 80 percent of the identified subsidence in the Nation is a consequence of our exploitation of underground water, and the increasing development of land and water resources threatens to exacerbate existing land-subsidence problems and initiate new ones.”

**Levee Failure**

A levee is a natural or artificial slope or wall, usually earthen and often parallel to the course of a river. The main purpose of an artificial levee is to prevent flooding of the adjoining countryside; however, they also confine the flow of the river, resulting in higher and faster water flow.

Levees can fail in a number of ways; the most frequent (and dangerous) form of levee failure is a breach. A breach is when part of the levee actually breaks away, leaving a large opening for water to flood the land protected by the levee. A breach can be a sudden or gradual failure that is caused either by surface erosion or by a subsurface failure of the levee.

Sometimes levees are said to fail when water overtops the levee, usually when flood waters exceed the crest of the levee. Overtopping, as this is called, can lead to significant landside erosion of the levee or be the cause of a complete breach.

**Radon**

Radon is a cancer-causing radioactive gas. You cannot see, smell or taste radon, but it may be a problem in your home. The Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today. If you smoke and your home has high radon levels, you’re at high risk for developing lung cancer. Some scientific studies of radon exposure indicate that children may be more sensitive to radon. This may be due to their higher respiration rate and their rapidly dividing cells, which may be more vulnerable to radiation damage. The diagram to the right shows how radon enters a house.

Since many of NH residents rely on well water and/or live in older homes that are not sealed for radon protection, radon levels are a concern in many communities. Home testing kits may be purchased for a reasonable fee at local hardware and home improvement stores.

**Severe Thunderstorms & Lightning**

All thunderstorms contain lightning. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, which can damage building walls and break glass.

Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the sun.

Although thunder that is heard during a storm cannot hurt you, the lightning that is associated with the thunder can not only strike people but also strike homes, out-buildings, grass and trees sparking disaster. Wildfires and structure loss are at a high risk during severe lightning events.

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18 Ibid
19 How radon enters a house; www.homeprocanada.ca/radon/HP_radon.htm
Smaller than areas affected by hurricanes and winter storms, a typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Nearly 1,800 thunderstorms are happening at any moment around the world.

Although thunderstorms and their associated lightning can occur any time of year, they are most likely to occur in the summer months and during the later afternoon or early evening hours and may even occur during a winter snowstorm.

*Severe Winter Storms

Ice & Snow Events

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 that freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects. Ice storms often produce widespread power outages.

Small Plane Crashes

Occasionally, small airports are located within or near communities; these airports usually have turf or dirt runways, no navigational aids and no lights. Small airports often cater to light sport aircraft, ultra lights, gliders, single engine planes and amateur built aircraft. The Code of Federal Regulations defines small aircraft to be “…aircraft of 12,500 pounds or less, maximum certificated takeoff weight.”

Although small plane accidents are infrequent, personal injury or death as well as a significant amount of structural damage can result. The Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) define an accident as “…an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, AND in which any person suffers death or serious injury or in which the aircraft receives substantial damage.”

Snow Avalanche

As defined by The American Heritage® Science Dictionary, an avalanche is the sudden fall or slide of a large mass of material down the side of a mountain. Avalanches may contain snow, ice, rock, soil, or a mixture of these materials. Avalanches can be triggered by changes in temperature, by sound vibrations, or by vibrations in the earth itself.

Avalanche occurrence in the State of New Hampshire is primarily limited to the slopes of the Presidential Range where there is little or no tree cover.

*Terrorism

Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.

Terrorists often use threats to: create fear among the public; try to convince citizens that their government is powerless to prevent terrorism; get immediate publicity for their causes.

Acts of terrorism include: threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber-attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons.

20 Code of Federal Regulations; Title 14, Aeronautics and Space; Part 1, Definitions and Abbreviations; http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=c758d3e7827620dad69ad30c6f7c8eab&rgn=log&div=div5&view=text&node=14:1.0.1.1.1&dono=14

21 Federal Aviation Administration; http://faa.custhelp.com/cgi-bin/faa.cfg/php/enduser/std_adp.php?p_faqid=337&p_creaded=1215177358&sid=bpgT%3cN%3b_accessibility=amp_/va=amp_/p_&p_e=cF9zcnoPSZfX3NvcmRlYmYnJnBlZjZjJpZHNvcnQ9JnBmcm93X2Nud D0mcF9wcm9zc3Z0mcF9yXRZtPSZfX3RnPSZXcm93X2NhZ2U9MQ**&p_li=&p_topview=1

22 Avalanche; derived from The American Heritage® Science Dictionary Copyright © 2005 by Houghton Mifflin Company; posted online by The Free Dictionary, definition 1; http://www.thefreedictionary.com/avalanche
High-risk targets for acts of terrorism include: military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail.

Within the immediate area of a terrorist event, you would need to rely on police, fire, and other officials for instructions. However, you can prepare in much the same way you would prepare for other crisis events.23

*Tornado & Downburst

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. Tornadoes 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.

A downburst is a strong downdraft which causes damaging winds on or near the ground according to NOAA. Not to be confused with downburst, the term “microburst” describes the size of the downburst. A comparison of a microburst and the larger macroburst shows that both can cause extreme winds.

A microburst is a downburst with winds extending 2 ½ miles or less, lasting 5 to 15 minutes and causing damaging winds as high as 168 MPH.

A macroburst is a downburst with winds extending more than 2 ½ miles lasting 5 to 30 minutes. Damaging winds, causing widespread, tornado-like damage, could be as high as 134 MPH.

*Violent Crime

The definition of violence as defined by US Legal Definitions states that “violence is a behavior by persons, against persons or property that intentionally threatens, attempts, or actually inflicts physical harm.” In addition, US Legal Definitions goes on to say that the “most common violent crimes are aggravated assault, arson, assault and battery, domestic violence, hate crimes, homicide, manslaughter, mayhem, murder, terrorism and theft/larceny.”24 Homicides are considered to be the most serious of all violent crimes.

New Hampshire Crime Rates 2002 - 200825

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Violent</th>
<th>Property</th>
<th>Murder</th>
<th>Forcible Rape</th>
<th>Robbery</th>
<th>Aggravated Assault</th>
<th>Burglary</th>
<th>Larceny-Theft</th>
<th>Vehicle Theft</th>
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</thead>
<tbody>
<tr>
<td>2002</td>
<td>1,274,405</td>
<td>2,056</td>
<td>26,250</td>
<td>12</td>
<td>446</td>
<td>413</td>
<td>1,185</td>
<td>4,838</td>
<td>19,468</td>
<td>1,944</td>
</tr>
<tr>
<td>2003</td>
<td>1,288,705</td>
<td>1,937</td>
<td>26,456</td>
<td>17</td>
<td>438</td>
<td>480</td>
<td>1,002</td>
<td>4,589</td>
<td>19,934</td>
<td>1,933</td>
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<tr>
<td>2004</td>
<td>1,299,169</td>
<td>2,202</td>
<td>26,658</td>
<td>17</td>
<td>466</td>
<td>500</td>
<td>1,219</td>
<td>4,979</td>
<td>19,723</td>
<td>1,956</td>
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<tr>
<td>2005</td>
<td>1,306,819</td>
<td>1,761</td>
<td>24,031</td>
<td>19</td>
<td>406</td>
<td>365</td>
<td>971</td>
<td>4,192</td>
<td>18,493</td>
<td>1,346</td>
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<tr>
<td>2006</td>
<td>1,314,895</td>
<td>1,824</td>
<td>24,642</td>
<td>13</td>
<td>344</td>
<td>423</td>
<td>1,044</td>
<td>4,358</td>
<td>18,862</td>
<td>1,422</td>
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<td>2007</td>
<td>1,315,828</td>
<td>1,807</td>
<td>24,896</td>
<td>15</td>
<td>333</td>
<td>432</td>
<td>1,027</td>
<td>4,986</td>
<td>18,611</td>
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<tr>
<td>2008</td>
<td>1,315,809</td>
<td>2,069</td>
<td>27,526</td>
<td>13</td>
<td>391</td>
<td>419</td>
<td>1,246</td>
<td>4,286</td>
<td>21,853</td>
<td>1,387</td>
</tr>
</tbody>
</table>

23 FEMA; http://www.fema.gov/hazard/terrorism/info.shtm
24 US Legal, Inc.; http://definitions.uslegal.com/v/violent-crimes/
25 The Disaster Center; selected years from http://www.disastercenter.com/crime/nhcrime.htm
*Wildfire*

“The threat of wildland fires for people living near wildland areas or using recreational facilities in wilderness areas is real. Dry conditions at various times of the year and in various parts of the United States greatly increase the potential for wildland fires.

Advance planning and knowing how to protect buildings in these areas can lessen the devastation of a wildland fire. There are several safety precautions that you can take to reduce the risk of fire losses. Protecting your home from wildfire is your responsibility. To reduce the risk, you'll need to consider the fire resistance of your home, the topography of your property and the nature of the vegetation close by.”

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### Appendix C: Summary of Possible Multi-Hazard Mitigation Strategies

#### I. RIVERINE MITIGATION

**A. Prevention**

Prevention measures are intended to keep the problem from occurring in the first place, and/or keep it from getting worse. Future development should not increase flood damage. Building, zoning, planning, and/or code enforcement offices usually administer preventative measures.

1. **Planning and Zoning**

   Land use plans are put in place to guide future development, recommending where - and where not - development should occur and where it should not. Sensitive and vulnerable lands can be designated for uses that would not be incompatible with occasional flood events - such as parks or wildlife refugees. A Capital Improvements Program (CIP) can recommend the setting aside of funds for public acquisition of these designated lands. The zoning ordinance can regulate development in these sensitive areas by limiting or preventing some or all development - for example, by designating floodplain overlay, conservation, or agricultural districts.

2. **Open Space Preservation**

   Preserving open space is the best way to prevent flooding and flood damage. Open space preservation should not, however, be limited to the floodplain, since other areas within the watershed may contribute to controlling the runoff that exacerbates flooding. Land Use and Capital Improvement Plans should identify areas to be preserved by acquisition and other means, such as purchasing easements. Aside from outright purchase, open space can also be protected through maintenance agreements with the landowners, or by requiring developers to dedicate land for flood flow, drainage and storage.

3. **Floodplain Development Regulations**

   Floodplain development regulations typically do not prohibit development in the special flood hazard area, but they do impose construction standards on what is built there. The intent is to protect roads and structures from flood damage and to prevent the development from aggravating the flood potential. Floodplain development regulations are generally incorporated into subdivision regulations, building codes, and floodplain ordinances.

   **Subdivision Regulations**

   These regulations govern how land will be divided into separate lots or sites. They should require that any flood hazard areas be shown on the plat, and that every lot has a buildable area that is above the base flood elevation.

   **Building Codes**

   Standards can be incorporated into building codes that address flood proofing for all new and improved or repaired buildings.

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Floodplain Ordinances
Communities that participate in the National Flood Insurance Program are required to adopt the minimum floodplain management regulations, as developed by FEMA. The regulations set minimum standards for subdivision regulations and building codes. Communities may adopt more stringent standards than those set forth by FEMA.

4. Stormwater Management
Development outside of a floodplain can contribute significantly to flooding by covering impervious surfaces, which increases storm water runoff. Storm water management is usually addressed in subdivision regulations. Developers are typically required to build retention or detention basins to minimize any increase in runoff caused by new or expanded impervious surfaces, or new drainage systems. Generally, there is a prohibition against storm water leaving the site at a rate higher than it did before the development. One technique is to use wet basins as part of the landscaping plan of a development. It might even be possible to site these basins based on a watershed analysis. Since detention only controls the runoff rates and not volumes, other measures must be employed for storm water infiltration - for example, swales, infiltration trenches, vegetative filter strips, and permeable paving blocks.

5. Drainage System Maintenance
Ongoing maintenance of channel and detention basins is necessary if these facilities are to function effectively and efficiently over time. A maintenance program should include regulations that prevent dumping in or altering water courses or storage basins; regrading and filling should also be regulated. Any maintenance program should include a public education component, so that the public becomes aware of the reasons for the regulations. Many people do not realize the consequences of filling in a ditch or wetland, or regrading.

B. Property Protection
Property protection measures are used to modify buildings subject to flood damage, rather than to keep floodwaters away. These may be less expensive to implement, as they are often carried out on a cost-sharing basis. In addition, many of these measures do not affect a building's appearance or use, which makes them particularly suitable for historical sites and landmarks.

1. Relocation
Moving structures out of the floodplain is the surest and safest way to protect against damage. Relocation is expensive, however, so this approach will probably not be used except in extreme circumstances. Communities that have areas subject to severe storm surges, ice jams, etc. might want to consider establishing a relocation program, incorporating available assistance.

2. Acquisition
Acquisition by a governmental entity of land in a floodplain serves two main purposes: 1) it ensures that the problem of structures in the floodplain will be addressed; and 2) it has the potential to convert problem areas into community assets, with accompanying environmental benefits. Acquisition is more cost effective than relocation in those areas that are subject to storm surges, ice jams, or flash flooding. Acquisition, followed by demolition, is the most appropriate strategy for those buildings that are simply too expensive to move, as well as for dilapidated structures that are not worth saving or protecting. Acquisition and subsequent relocation can be expensive, however, there are government grants and loans that can be applied toward such efforts.

3. Building Elevation
Elevating a building above the base flood elevation is the best on-site protection strategy. The building could be raised to allow water to run underneath it, or fill could be brought in to elevate the site on which the building sits. This approach is cheaper than relocation, and tends to be less disruptive to a neighborhood. Elevation is required by law for new and substantially improved residences in a floodplain, and is commonly practiced in flood hazard areas nationwide.

4. Floodproofing
If a building cannot be relocated or elevated, it may be floodproofed. This approach works well in areas of low flood threat. Floodproofing can be accomplished through barriers to flooding, or by treatment to the structure itself.

Barriers: Levees, floodwalls and berms can keep floodwaters from reaching a building. These are useful, however, only in areas subject to shallow flooding.

Dry Floodproofing: This method seals a building against the water by coating the walls with waterproofing compounds or plastic sheeting. Openings, such as doors, windows, etc. are closed either permanently with removable shields or with sandbags.
Wet Floodproofing: This technique is usually considered a last resort measure, since water is intentionally allowed into the building in order to minimize pressure on the structure. Approaches range from moving valuable items to higher floors to rebuilding the floodable area. An advantage over other approaches is that simply by moving household goods out of the range of floodwaters, thousands of dollars can be saved in damages.

5. Sewer Backup Protection
Storm water overloads can cause backup into basements through sanitary sewer lines. Houses that have any kind of connection to a sanitary sewer system - whether it is downsprouts, footing drain tile, and/or sump pumps, can be flooded during a heavy rain event. To prevent this, there should be no such connections to the system, and all rain and ground water should be directed onto the ground, away from the building. Other protections include:

- Floor drain plugs and floor drain standpipe, which keep water from flowing out of the lowest opening in the house.
- Overhead sewer - keeps water in the sewer line during a backup.
- Backup valve - allows sewage to flow out while preventing backups from flowing into the house.

6. Insurance
Above and beyond standard homeowner insurance, there is other coverage a homeowner can purchase to protect against flood hazard. Two of the most common are National Flood Insurance and basement backup insurance.

National Flood Insurance
When a community participates in the National Flood Insurance Program, any local insurance agent is able to sell separate flood insurance policies under rules and rates set by FEMA. Rates do not change after claims are paid because they are set on a national basis.

Basement Backup Insurance
National Flood Insurance offers an additional deductible for seepage and sewer backup, provided there is a general condition of flooding in the area that was the proximate cause of the basement getting wet. Most exclude damage from surface flooding that would be covered by the NFIP.

C. Natural Resource Protection
Preserving or restoring natural areas or the natural functions of floodplain and watershed areas provide the benefits of eliminating or minimizing losses from floods, as well as improving water quality and wildlife habitats. Parks, recreation, or conservation agencies usually implement such activities. Protection can also be provided through various zoning measures that are specifically designed to protect natural resources.

1. Wetlands Protection
Wetlands are capable of storing large amounts of floodwaters, slowing and reducing downstream flows, and filtering the water. Any development that is proposed in a wetland is regulated by either federal and/or state agencies. Depending on the location, the project might fall under the jurisdiction of the U.S. Army Corps of Engineers, which in turn, calls upon several other agencies to review the proposal. In New Hampshire, the N.H. Wetlands Board must approve any project that impacts a wetland. Many communities in New Hampshire also have local wetland ordinances.

Generally, the goal is to protect wetlands by preventing development that would adversely affect them. Mitigation techniques are often employed, which might consist of creating a wetland on another site to replace what would be lost through the development. This is not an ideal practice since it takes many years for a new wetland to achieve the same level of quality as an existing one, if it can at all.

2. Erosion and Sedimentation Control
Controlling erosion and sediment runoff during construction and on farmland is important, since eroding soil will typically end up in downstream waterways. Because sediment tends to settle where the water flow is slower, it will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters.

3. Best Management Practices
Best Management Practices (BMPs) are measures that reduce non-point source pollutants that enter waterways. Non-point source pollutants are carried by storm water to waterways, and include such things as lawn fertilizers, pesticides, farm chemicals, and oils from street surfaces and industrial sites. BMPs can be incorporated into many aspects of new developments and ongoing land use practices. In New Hampshire, the Department of Environmental Services has developed Best Management Practices for a range of activities, from farming to earth excavations.
D. Emergency Services

Emergency services protect people during and after a flood. Many communities in New Hampshire have emergency management programs in place, administered by an emergency management director (very often the local police or fire chief).

1. Flood Warning

On large rivers, the National Weather Service handles early recognition. Communities on smaller rivers must develop their own warning systems. Warnings may be disseminated in a variety of ways, such as sirens, radio, television, mobile public address systems, or door-to-door contact. It seems that multiple or redundant systems are the most effective, giving people more than one opportunity to be warned.

2. Flood Response

Flood response refers to actions that are designed to prevent or reduce damage or injury, once a flood threat is recognized. Such actions and the appropriate parties include:

- Activating the emergency operations center (emergency director)
- Sandbagging designated areas (public works department)
- Closing streets and bridges (police department)
- Shutting off power to threatened areas (public service)
- Releasing children from school (school district)
- Ordering an evacuation (selectmen/city council/emergency director)
- Opening evacuation shelters (churches, schools, Red Cross, municipal facilities)

These actions should be part of a flood response plan, which should be developed in coordination with the persons and agencies that share the responsibilities. Drills and exercises should be conducted so that the key participants know what they are supposed to do.

3. Critical Facilities Protection

Protecting critical facilities is vital, since expending efforts on these facilities can draw workers and resources away from protecting other parts of town. Critical facilities fall into two categories:

**Buildings or locations vital to the flood response effort:**

- Emergency operations centers
- Police and fire stations
- Hospitals
- Highway garages
- Selected roads and bridges
- Evacuation routes

**Buildings or locations that, if flooded, would create secondary disasters:**

- Hazardous materials facilities
- Water/wastewater treatment plants
- Schools
- Nursing homes

All such facilities should have their own flood response plan that is coordinated with the community’s plan. Nursing homes, other public health facilities, and schools will typically be required by the state to have emergency response plans in place.

4. Health and Safety Maintenance

The flood response plan should identify appropriate measures to prevent danger to health and safety. Such measures include:

- Patrolling evacuated areas to prevent looting
- Vaccinating residents for tetanus
- Clearing streets
- Cleaning up debris

The Plan should also identify which agencies will be responsible for carrying out the identified measures. A public information program can be helpful to educate residents on the benefits of taking health and safety precautions.
E. Structural Projects

Structural projects are used to prevent floodwaters from reaching properties. These are all man-made structures, and can be grouped into the six types discussed below. The shortcomings of structural approaches are:

- They can be very expensive
- They disturb the land, disrupt natural water flows, and destroy natural habitats.
- They are built to an anticipated flood event, and may be exceeded by a greater-than-expected flood
- They can create a false sense of security.

1. Reservoirs

Reservoirs control flooding by holding water behind dams or in storage basins; After a flood peaks, water is released or pumped out slowly at a rate the river downstream can handle.

Reservoirs are suitable for protecting existing development, and they may be the only flood control measure that can protect development close to a watercourse. They are most efficient in deeper valleys or on smaller rivers where there is less water to store. Reservoirs might consist of man-made holes dug to hold the approximate amount of floodwaters, or even abandoned quarries. As with other structural projects, reservoirs:

- are expensive
- occupy a lot of land
- require periodic maintenance
- may fail to prevent damage from floods that exceed their design levels
- may eliminate the natural and beneficial functions of the floodplain.

Reservoirs should only be used after a thorough watershed analysis that identifies the most appropriate location, and ensures that they would not cause flooding somewhere else. Because they are so expensive and usually involve more than one community, they are typically implemented with the help of state or federal agencies, such as the Army Corps of Engineers.

2. Levees/Floodwalls

Probably the best known structural flood control measure is either a levee (a barrier of earth) or a floodwall made of steel or concrete erected between the watercourse and the land. If space is a consideration, floodwalls are typically used, since levees need more space. Levees and floodwalls should be set back out of the floodway, so that they will not divert floodwater onto other properties.

3. Diversions

A diversion is simply a new channel that sends floodwater to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During flood flows, the stream spills over the diversion channel or tunnel, which carries the excess water to the receiving lake or river. Diversions are limited by topography; they won't work everywhere. Unless the receiving water body is relatively close to the flood prone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive. Where topography and land use are not favorable, a more expensive tunnel is needed. In either case, care must be taken to ensure that the diversion does not create a flooding problem somewhere else.

4. Channel Modifications

Channel modifications include making a channel wider, deeper, smoother, or straighter. These techniques will result in more water being carried away, but, as with other techniques mentioned, it is important to ensure that the modifications do not create or increase a flooding problem downstream.

Dredging

Dredging is often cost-prohibitive because the dredged material must be disposed of in another location; the stream will usually fill back in with sediment. Dredging is usually undertaken only on larger rivers, and then only to maintain a navigation channel.

Drainage Modifications

These include man-made ditches and storm sewers that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive. These approaches are usually designed to carry the runoff from smaller, more frequent storms.
5. Storm Sewers
Mitigation techniques for storm sewers include installing new sewers, enlarging small pipes, street improvements, and preventing back flow. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving body of water can absorb the increased flows without increased flooding. In many developments, streets are used as part of the drainage system, to carry or hold water from larger, less frequent storms. The streets collect runoff and convey it to a receiving sewer, ditch, or stream. Allowing water to stand in the streets and then draining it slowly can be a more effective and less expensive measure than enlarging sewers and ditches.

F. Public Information
Public information activities are intended to advise property owners, potential property owners, and visitors about the particular hazards associated with a property, ways to protect people and property from these hazards, and the natural and beneficial functions of a floodplain.

1. Map Information
Flood maps developed by FEMA outline the boundaries of the flood hazard areas. These maps can be used by anyone interested in a particular property to determine if it is flood-prone. These maps are available from FEMA, the NH Homeland Security and Emergency Management (HSEM), the NH Office of Energy and Planning (OEP), or your regional planning commission.

2. Outreach Projects
Outreach projects are proactive; they give the public information even if they have not asked for it. Outreach projects are designed to encourage people to seek out more information and take steps to protect themselves and their properties. Examples of outreach activities include:

- Presentations at meetings of neighborhood groups
- Mass mailings or newsletters to all residents
- Notices directed to floodplain residents
- Displays in public buildings, malls, etc.
- Newspaper articles and special sections
- Radio and TV news releases and interview shows
- A local flood proofing video for cable TV programs and to loan to organizations
- A detailed property owner handbook tailored for local conditions. Research has shown that outreach programs work, although awareness is not enough. People need to know what they can do about the hazards, so projects should include information on protection measures. Research also shows that locally designed and run programs are much more effective than national advertising.

3. Real Estate Disclosure
Disclosure of information regarding flood-prone properties is important if potential buyers are to be in a position to mitigate damage. Federally regulated lending institutions are required to advise applicants that a property is in the floodplain. However, this requirement needs to be met only five days prior to closing, and by that time, the applicant is typically committed to the purchase. State laws and local real estate practice can help by making this information available to prospective buyers early in the process.

4. Library
Your local library can serve as a repository for pertinent information on flooding and flood protection. Some libraries also maintain their own public information campaigns, augmenting the activities of the various governmental agencies involved in flood mitigation.

5. Technical Assistance
Certain types of technical assistance are available from the NFIP Coordinator, FEMA, and the Natural Resources Conservation District. Community officials can also set up a service delivery program to provide one-on-one sessions with property owners.

An example of technical assistance is the flood audit, in which a specialist visits a property. Following the visit, the owner is provided with a written report detailing the past and potential flood depths and recommending alternative protection measures.
6. Environmental Education

Education can be a great mitigating tool if people can learn what not to do before damage occurs. The sooner the education begins the better. Environmental education programs for children can be taught in the schools, park and recreation departments, conservation associations, or youth organizations. An activity can be as involved as course curriculum development or as simple as an explanatory sign near a river.

Education programs do not have to be limited to children. Adults can benefit from knowledge of flooding and mitigation measures; decision makers, armed with this knowledge, can make a difference in their communities.

II. EARTHQUAKES

A. Preventive
   1. Planning/zoning to keep critical facilities away from fault lines
   2. Planning, zoning and building codes to avoid areas below steep slopes or soils subject to liquefaction
   3. Building codes to prohibit loose masonry overhangs, etc.

B. Property Protection
   1. Acquire and clear hazard areas
   2. Retrofitting to add braces, remove overhangs
   3. Apply Mylar to windows and glass surfaces to protect from shattering glass
   4. Tie down major appliances, provide flexible utility connections
   5. Earthquake insurance riders

C. Emergency Services
   1. Earthquake response plans to account for secondary problems, such as fires and hazardous material spills

D. Structural Projects
   1. Slope stabilization

III. DAM FAILURE

A. Preventive
   1. Dam failure inundation maps
   2. Planning/zoning/open space preservation to keep area clear
   3. Building codes with flood elevation based on dam failure
   4. Dam safety inspections
   5. Draining the reservoir when conditions appear unsafe

B. Property Protection
   1. Acquisition of buildings in the path of a dam breach flood
   2. Flood insurance

C. Emergency Services
   1. Dam condition monitoring
   2. Warning and evacuation plans based on dam failure

D. Structural Projects
   1. Dam improvements, spillway enlargements
   2. Remove unsafe dams

IV. WILDFIRES

A. Preventive
   1. Zoning districts to reflect fire risk zones
   2. Planning and zoning to restrict development in areas near fire protection and water resources
   3. Requiring new subdivisions to space buildings, provide firebreaks, on-site water storage, wide roads, multiple accesses
   4. Building code standards for roof materials and spark arrestors
   5. Maintenance programs to clear dead and dry brush, trees
   6. Regulation on open fires
B. Property Protection
   1. Retrofitting of roofs and adding spark arrestors
   2. Landscaping to keep bushes and trees away from structures
   3. Insurance rates based on distance from fire protection

C. Natural Resource Protection
   1. Prohibit development in high-risk areas

D. Emergency Services
   1. Fire Fighting

V. WINTER STORMS

A. Prevention
   1. Building code standards for light frame construction, especially for wind-resistant roofs

B. Property Protection
   1. Storm shutters and windows
   2. Hurricane straps on roofs and overhangs
   3. Seal outside and inside of storm windows and check seals in spring and fall
   4. Family and/or company severe weather action plan & drills:
      • include a NOAA Weather Radio
      • designate a shelter area or location
      • keep a disaster supply kit, including stored food and water
      • keep snow removal equipment in good repair; have extra shovels, sand, rock, salt and gas
      • know how to turn off water, gas, and electricity at home or work

C. Natural Resource Protection
   1. Maintenance program for trimming trees and shrubs

D. Emergency Services
   1. Early warning systems/NOAA Weather Radio
   2. Evacuation plans
Appendix D: List of Contacts

NH Homeland Security & Emergency Management
Hazard Mitigation Section .................................................. 271-2231

Federal Emergency Management Agency (Boston) 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 RPC ........................................... 444-6303
Rockingham Planning Commission .................................... 778-0885
Southern New Hampshire Planning Commission .................. 669-4664
Southwest Region Planning Commission .............................. 357-0557
Strafford Regional Planning Commission ............................. 742-2523
Upper Valley Lake Sunapee RPC ..................................... 448-1680

NH Executive Department:
New Hampshire Office Energy & Planning .......................... 271-2155

NH Department of Cultural Affairs .................................. 271-2540
Division of Historical Resources ...................................... 271-3483

NH Department of Environmental Services ...................... 271-3503
Air Resources .............................................................. 271-1370
Waste Management ...................................................... 271-2900
Water Resources ........................................................ 271-3406
Water Supply and Pollution Control ................................... 271-3434
Rivers Management and Protection Program ....................... 271-8801
Bureau of Dams ........................................................... 271-3503

NH Fish and Game Department ........................................ 271-3421

NH DRED ................................................................. 271-2411
Natural Heritage Inventory ............................................. 271-3623
Division of Forests and Lands .......................................... 271-2214
Division of Parks and Recreation ...................................... 271-3556

NH Department of Transportation ..................................... 271-3734

US Department of Commerce:
National Oceanic and Atmospheric Administration:
National Weather Service; Gray, Maine ............................ 207-688-3216

US Department of Interior:
US Fish and Wildlife Service .......................................... 223-2541

US Geological Survey .................................................... 225-4681

US Department of Agriculture:
Natural Resource Conservation Service ............................. 868-7581

New Hampshire State Police .......................................... 846-3333

Verified, January 2010

Additional Websites of Interest

Natural Hazards
Research Center, U. of Colorado
http://www.colorado.edu/hazards/

National Emergency Management Association
http://nemaweb.org

NASA-Earth Observatory
http://earthobservatory.nasa.gov/NaturalHazards/cateory.php?cat_id=12

NASA Natural Disaster Reference
Reference of worldwide natural disasters
http://gcmd.nasa.gov/records/NASA-NDRD.html

National Weather Service
Weather Warnings, 60 Second Updates
http://nws.noaa.gov

FEMA, National Flood Insurance Program, Community Status Books
http://fema.gov/business/nfip/

Florida State & NWS University Atlantic
Hurricane Site
http://www.met.fsu.edu/orgs/explores/

National Lightning Safety Institute
List of Lightning Safety Publications
http://lightningsafety.com

NASA Optical Transient Detector
Space-based sensor of lightning strikes
http://www.gr.ssr.upm.es/~jambrina/rayos/thunder.mstc.nasa.gov/old.html

LLNL Geologic & Atmospheric Hazards
General Hazard Information
https://www.llnl.gov/

The Tornado Project Online
Recent tornado information & details
http://www.tornado.project.com/

National Severe Storms Laboratory
Information & tracking of severe storms
http://www.nssl.noaa.gov/

USDA Forest Service
Forest Fire & Land Management Information
http://www.fs.fed.us/fire
Appendix E: Technical and Financial Assistance for Multi-Hazard Mitigation

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. Currently, FEMA administers the following HMA grant programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)

FEMA's HMA grants are provided to eligible Applicants (States/Tribes/Territories) that, in turn, provide sub-grants to local governments and communities. The Applicant selects and prioritizes sub-applications developed and submitted to them by subapplicants. These sub-applications are submitted to FEMA for consideration of funding. Prospective sub-applicants should consult the office designated as their Applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers is available on the FEMA website, www.fema.gov.

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<thead>
<tr>
<th>Table 2: Eligible Subapplicants</th>
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<tbody>
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<td>State agencies</td>
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<tr>
<td>Tribal governments</td>
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<tr>
<td>Local governments/communities</td>
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<td>Private non-profit organizations (PNPs)</td>
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Eligibility Chart taken from the FY 2010 Hazard Mitigation Assistance (HMA) Unified Guidance

HMA Grant Programs

The HMA grant programs provide funding opportunities for pre- and post-disaster mitigation. 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. Brief descriptions of the HMA grant programs can be found below. For more information on the individual programs, or to see information related to a specific Fiscal Year, please click on one of the program links.

A. Hazard Mitigation Grant Program (HMGP)

HMGP assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.

What is the 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. Authorized under Section 404 of the Stafford Act and administered by FEMA, HMGP was created to reduce the loss of life and property due to natural

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27 Information in Appendix E is taken from the following website and links to specific programs unless otherwise noted; http://www.fema.gov/government/grant/hma/index.shtm
disasters. The program enables mitigation measures to be implemented during the immediate recovery from a disaster.

Who is eligible to apply?

Hazard Mitigation Grant Program funding is only available to applicants that reside within a presidentially declared disaster area. Eligible applicants are

- State and local governments
- Indian tribes or other tribal organizations
- Certain non-profit organizations

Individual homeowners and businesses may not apply directly to the program; however a community may apply on their behalf.

How are potential projects selected and identified?

The State's administrative plan governs how projects are selected for funding. However, proposed projects must meet certain minimum criteria. These criteria are designed to ensure that the most cost-effective and appropriate projects are selected for funding. Both the law and the regulations require that the projects are part of an overall mitigation strategy for the disaster area.

The State prioritizes and selects project applications developed and submitted by local jurisdictions. The State forwards applications consistent with State mitigation planning objectives to FEMA for eligibility review. Funding for this grant program is limited and States and local communities must make difficult decisions as to the most effective use of grant funds.

For more information on the Hazard Mitigation Grant Program (HMGP), go to: http://www.fema.gov/government/grant/hmgp/index.shtm

B. Pre-Disaster Mitigation (PDM)

PDM provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. The goal of the PDM program is to reduce overall risk to the population and structures, while at the same time, also reducing reliance on Federal funding from actual disaster declarations.

Program Overview

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.
C. Flood Mitigation Assistance (FMA)

FMA provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program.

Program Overview

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.

Types of FMA Grants

Three types of FMA grants are available to States and communities:

- **Planning Grants** to prepare Flood Mitigation Plans. Only NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project grants
- **Project Grants** to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
- **Technical Assistance Grants** for the State to help administer the FMA program and activities. Up to ten percent (10%) of Project grants may be awarded to States for Technical Assistance Grants

D. Repetitive Flood Claims (RFC)

RFC provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% federal funding for projects in communities that meet the reduced capacity requirements.

Program Overview


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).

Federal / Non-Federal Cost Share

FEMA may contribute up to 100 percent of the total amount approved under the RFC grant award to implement approved activities, if the Applicant has demonstrated that the proposed activities cannot be funded under the Flood Mitigation Assistance (FMA) program.
E. Severe Repetitive Loss (SRL)

SRL provides funds on an annual basis to reduce the risk of flood damage to residential structures insured under the NFIP that are qualified as severe repetitive loss structures. SRL provides up to 90% federal funding for eligible projects.

Program Overview

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).

Definition

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.

Purpose:

To reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the National Flood Insurance Fund (NFIF).

Federal / Non-Federal cost share:

75 / 25 %; up to 90 % Federal cost-share funding for projects approved in States, Territories, and Federally-recognized Indian tribes with FEMA-approved Standard or Enhanced Mitigation Plans or Indian tribal plans that include a strategy for mitigating existing and future SRL properties.
Appendix F: Wildfire Planning

Wildfire Terminology

**Aspect** - Direction toward which a slope faces.

**At-Risk Community** - Group of homes or other improvements within or adjacent to federal land in which conditions are conducive to a large-scale wildland fire and pose a significant threat to human life or property.

**Cistern** - A tank that stores water.

**Community Wildfire Protection Program** - A plan developed by a community at risk from wildfire directed by a planning process outlined by the US Forest Service.

**Defensible Space** - A designated area around a home that is intentionally maintained to be free of features that would increase the risk or damage from wildfire.

**Dry Hydrant** - A non-pressurized pipe system permanently installed in existing lakes, ponds, and streams that provides means of suction supply of water to a tank truck. The dry hydrant system gives the trucks access to water sources from a main road.

**Fire Break** - A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

**Fuel** - Combustible material includes vegetation, such as grass, leaves, ground litter, plants, shrubs and trees that feed a fire.

**Fuel Loading** - The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

**Mitigation** - An effort to reduce or eliminate the impacts of injury or damage from a hazard or disaster.

**Mutual Aid Agreement** - Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

**Prescribed Fire (RX Burn)** - Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition on Federal land.

**Red Flag Warning** - Term used by fire weather forecasters to alert forecast users to an ongoing or eminent critical fire weather pattern.

**Slash** - The remnants of tree limbs, thinning, and ground fuel reduction.

**Slope** - The variation of terrain from the horizontal; the number of feet rise or fall per 100 feet measured horizontally, expressed as a percentage.

**Suppression** - The work of extinguishing or containing a fire, beginning with its discovery.

**Surface Fuels** - Lose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity.

**Wildfire** - An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

**Wildland Fire** - A wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities.

**Wildland_Urban Interface (WUI)** - The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.
Wildfire Funding

This funding chart provides information about key grant programs and a number of sources that could be beneficial to implementation of the wildfire portion of the Northumberland Multi-Hazard Mitigation Plan. Funding sources from many federal, state and local sources may change periodically, be discontinued or new programs could be developed after the publication of this planning document. For the most up-to-date information, the Town should always consult the source itself before applying for funding. This chart attempts to identify, to best ability, the most local contact information, however, this information can also change over time. As a part of updating this plan in the future, this chart should be revised.

<table>
<thead>
<tr>
<th>TITLE</th>
<th>DEPARTMENT</th>
<th>CONTACT INFORMATION</th>
<th>PURPOSE</th>
<th>GRANT AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Fire Assistance</td>
<td>Department of the Interior</td>
<td>FWS Steve Hubner 757-986-3409 ext. 104</td>
<td>The RFA program provides funds for RFDs that: •Protect rural, wildland-urban interface communities •Play a substantial cooperative role in the protection of federal lands •Are cooperators with the Department of the Interior (DOI) managed lands through cooperative agreements with the DOI, or their respective state, tribe, or equivalent •Are less than 10,000 in population</td>
<td>Maximum Award $20,000</td>
</tr>
<tr>
<td>Assistance to Firefighters Grant</td>
<td>Dept. of Homeland Security</td>
<td><a href="http://www.firegrantsupport.com">www.firegrantsupport.com</a></td>
<td>Awards one-year grants directly to fire dept. and nonaffiliated emergency medical service org. in order to enhance their ability with respect to fire and fire-related hazards.</td>
<td>varies</td>
</tr>
<tr>
<td>Fire Prevention and Safety</td>
<td>Dept. of Homeland Security</td>
<td>1-866-274-0960 <a href="http://www.firegrantsupport.com">www.firegrantsupport.com</a></td>
<td>The purpose is to reduce losses due to fire related hazards through public education, arson prevention, code enforcement, wildfire prevention/awareness and education, data collection and analysis.</td>
<td>Federal share limited to $1M</td>
</tr>
<tr>
<td>Staffing For Adequate Fire and Emergency Response Grant</td>
<td>Dept. of Homeland Security</td>
<td><a href="http://www.firegrantssupport.com">www.firegrantssupport.com</a></td>
<td>To provide funding directly to fire departments and volunteer firefighter interest organizations to help increase the number of firefighters. To enhance the ability of fire departments to attain staffing and to have adequate protection.</td>
<td></td>
</tr>
<tr>
<td>Fire Management Assistance Grant</td>
<td>FEMA</td>
<td>Region I Boston, MA 877-336-2734</td>
<td>Disaster assistance grant program available to states, local governments, and Indian tribes with mitigation, management, and control fires burning on publicly or private forests that threaten such destruction as would constitute a major disaster.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G: Acronyms

Multi-Hazard Mitigation Planning
List of Acronyms

BFE ......................... Base Flood Elevation
BOCA ....................... Building Officials and Code Administrators International, Incorporated
CIKR ....................... Critical Infrastructure & Key Resources
CIP ......................... Capital Improvements Program
CWPP ........................ Community Wildfire Protection Plan
DRED ....................... Department of Resources & Economic Development
EMD ....................... Emergency Management Director
EMS ....................... Emergency Medical Services
EOC ....................... Emergency Operations Center
ERF ....................... Emergency Response Facility
FEMA ....................... Federal Emergency Management Administration
FIRM ....................... Flood Insurance Rate Map
FPP ....................... Facilities & Populations to Protect
GIS ........................ Geographic Information System
HFRA ....................... Healthy Forest Restoration Act
HMGP ....................... Hazard Mitigation Grant Program
HSEM ........................ Homeland Security & Emergency Management (NH)
ICS ....................... Incident Command System
LEOP ....................... Local Emergency Operations Plan
MOU ....................... Memorandum of Understanding
NC RC & D ............... North Country Resource Conservation & Development District
NCC ....................... North Country Council
NERF ....................... Non-Emergency Response Facility
NFIP ....................... National Flood Insurance Program
NGVD ..................... National Geodetic Vertical Datum of 1929
NHDOT ..................... NH Department of Transportation
NIMS ....................... National Incident Management System
PR ........................ Potential Resources
SPNHF ..................... Society for the Protection of New Hampshire Forests
USDA ....................... US Department of Agriculture
USDA-FS ................... USDA-Forest Service
USGS ....................... United States Geological Society
WMNF ...................... White Mountain National Forest
WUI ....................... Wildland Urban Interface
Map Documents (11 x 17)

Map 1 – Base Risk Analysis
Map 2 – Historic Wildfires & the Wildland Urban Interface (WUI)
Map 3 – Historic & Potential Hazard Identification
Map 4.1 – Critical Infrastructure & Key Resources
Map 4.2 – Critical Infrastructure & Key Resources, Detail
PLACE HOLDER FOR MAP 1
PLACE HOLDER FOR MAP 3
PLACE HOLDER FOR MAP 3
PLACE HOLDER FOR MAP 4.1
PLACE HOLDER FOR MAP 4.1
PLACE HOLDER FOR MAP 4.2
PLACE HOLDER FOR MAP 4.2
Route 3 Approaching Groveton Village
Photo Credit: Carole Bont, North Country Council

For the Town of Northumberland

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