

Wentworth

Hazard Mitigation

Plan

Update 2014



This Plan integrates the following:

- **Hazard Mitigation Plan Update (FEMA)**
- **Community Wildfire Protection Plan (DRED)**

December 23, 2014 (Adoption Date)
Final Plan

Prepared for the Town of Wentworth and NH Homeland Security & Emergency Management

By
The Wentworth Planning Team

With assistance from Mapping and Planning Solutions

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“Plans are worthless, but planning is everything. There is a very great distinction because when you are planning for an emergency you must start with this one thing: The very definition of “emergency” is that it is unexpected, therefore it is not going to happen the way you are planning.”

-Dwight D. Eisenhower

HAZARD MITIGATION PLAN DEFINITIONS

“A natural hazard is a source of harm or difficulty created by a meteorological, environmental, or geological event.”

“Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards (44CFR 201.2). Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.”

(Source: Local Mitigation Plan Review Guide, FEMA, October 1, 2011)



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**Cover: Wentworth Congregational Church
Photo Credit: MAPS**

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Acknowledgements

This Plan integrates elements to qualify it as a Community Wildfire Protection Plan (CWPP) according to the US Forest Service and the Department of Resources and Economic Development.

The Plan was created through a grant from New Hampshire Homeland Security & Emergency Management (HSEM). The following organizations have contributed invaluable assistance and support for this project:

- New Hampshire Homeland Security & Emergency Management (HSEM)
- NH Office of Energy & Planning (NHOEP)
- Federal Emergency Management Agency (FEMA)
- Mapping and Planning Solutions (MAPS)
- NH Forests & Lands (DRED)

This Plan is an update to the original Wentworth Hazard Mitigation Plan, approved March 11, 2009.

Approval Notification Dates for 2014 Update

Approved Pending Adoption (APA):.....	November 17, 2014
Jurisdiction Adoption:	December 23, 2014
CWPP Approval:	To be determined
Plan Approval Date (FEMA):.....	To be determined
Plan Distribution (MAPS):	To be determined

Town of Wentworth Hazard Mitigation Planning Team

The Town of Wentworth would like to thank the following people for the time and effort spent to complete this Plan; the following people have attended meetings and/or been instrumental in completing this Plan:

- | | |
|--|---|
| Jeffery Ames..... Wentworth EMD & Fire Chief | Francis Muzzey Wentworth Select Board |
| Catherine Stover..... Wentworth Administrative Assistant | Kenyon Karl..... Wentworth Resident |
| Steve Davis Wentworth Chair of the Select Board | Debi Gelsi..... Wentworth Resident |
| Kevin Kay Wentworth Police Chief | Megan Gelsi Wentworth Resident |
| Bobby Cass Wentworth Road Agent (former) | Jennifer Gilbert NH OEP |
| Justine McComiskey.... Student | Paul Hatch..... NH HSEM |
| Ellie Murray..... Wentworth PB & Conservation | June Garneau..... MAPS |

Many thanks for all the hard work and effort given by each and every one of you. This Plan would not exist without your knowledge and experience. The Town of Wentworth also thanks the Federal Emergency Management Agency and NH Homeland Security and Emergency Management as the primary funding sources for this Plan.

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Photo Credit: www.wentworth-nh.org

Executive Summary

The Wentworth Hazard Mitigation Plan Update 2014 was compiled to assist the Town of Wentworth in reducing and mitigating future losses from natural or human-caused hazardous events. The Plan was developed by participants of the Town of Wentworth Hazard Mitigation Planning Team, interested stakeholders, the general public and Mapping and Planning Solutions (MAPS). The Plan contains the tools necessary to identify specific hazards and aspects of existing and future mitigation efforts.

This Plan is an **update** to the 2009 Wentworth Hazard Mitigation Plan. In an effort to produce an accurate and current planning document, the Planning Team used the 2009 Plan as a foundation, building upon that Plan to provide more timely information.

This Plan addresses the following natural hazards and human-caused hazards.

Natural Hazards

- | | |
|--|-----------------------------------|
| 1) Flooding (riverine) | 8) Downbursts (micro & macro) |
| 2) High Winds (windstorm) | 9) Earthquake |
| 3) Severe Winter Weather (ice & snow storms) | 10) Mudslide, Landslide & Erosion |
| 4) Thunder & Lightning Storms | 11) Hailstorm |
| 5) Hurricane & Tropical Storms | 12) Drought |
| 6) Extreme Temperatures | 13) Tornado |
| 7) Wildfire | |

Human-Caused Hazards

- | | |
|-----------------------------------|--|
| 1) Extended Power Outages | 4) Epidemic & Pandemic |
| 2) Hazardous Material – Transport | 5) Hazardous Material – Fixed Location |
| 3) Dam Failure (4dams) | 6) Terrorism |

This Plan also provides a list of Critical Infrastructure and Key Resources (CIKR) categorized as follows: Necessary for Emergency Response Facilities (ERF), Not Necessary for Emergency Response Facilities (NERF), Facilities and 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 hazard mitigation plan was designed to include a detailed study and analysis of wildfire/structure fires. The original goal was to produce separate plans but that concept produced excessive overlap and cost. To streamline the process, the Community Wildfire Protection Plan (CWPP) was fully integrated into this hazard mitigation plan as were risks from human-caused hazards.

Although mitigation action items are the main focus of this Plan, it is at times difficult to arrive at true mitigation projects. Some communities, though faced with an array of natural hazards, are able to adequately cope with the impact of these hazards. For example, although *Severe Winter Weather* is often a common hazard in New Hampshire and more often than not considered to be the most likely to occur, most New Hampshire communities handle two-three foot snow storms with little or no disruption of services. On the other hand, an unexpected ice storm can have disastrous effects on a community. Mitigation for this type of sudden storm is difficult to achieve; establishing warming and cooling centers, establishing notification systems, providing public outreach, tree trimming, opening shelters and perhaps burying overhead power lines are just a few of the action items that may be put in place.

In summary, finding mitigation action items for every hazard that effects a community is at times difficult. In addition, with today's economic constraints, cities and towns are less likely to have the financial ability to create some mitigation action items, such as burying power lines. In preparing this Plan, the Wentworth Planning Team has considered a comprehensive list of mitigation action items that could diminish the impact of hazards but has also decided to maintain a list of preparedness action items for future reference and action.

To simplify the language in the Plan, the following abbreviations and acronyms will be used:

Wentworth Hazard Mitigation Plan Update 2014.....	the Plan or this Plan
Wentworth.....	the Town or the Community
Hazard Mitigation Planning Team.....	the Team
Hazard Mitigation Plan.....	HMP
Emergency Operations Plan.....	EOP
Community Wildfire Protection Plan.....	CWPP
Mapping and Planning Solutions.....	MAPS
Mapping and Planning Solutions Planner.....	the Planner
NH Homeland Security & Emergency Management.....	HSEM
Federal Emergency Management Agency.....	FEMA

For more acronyms, please refer to *Appendix F: Acronyms*

Mission Statement:

To make Wentworth less vulnerable to the effects of hazards through the effective administration of hazard mitigation planning, wildfire hazard assessments, and a coordinated approach to mitigation policy and planning activities.

Vision Statement:

The community of Wentworth will reduce the impacts of natural hazards and other potential disasters through implementing mitigation measures, public education and deliberate capital expenditures within the community. Homes and businesses will be safer and the community's ISO rating may be improved.

Chapter 1: Hazard Mitigation Planning Process

A. Authority & Funding

The Wentworth Hazard Mitigation Plan Update 2014 was prepared in accordance with the Disaster Mitigation Act of 2000 (DMA), Section 322 Mitigation Planning, signed into law by President Clinton on October 30, 2000. This hazard mitigation plan was prepared by the Wentworth Hazard Mitigation Planning Team 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) and with the assistance and professional services of Mapping and Planning Solutions. This Plan was funded by HSEM through grants from FEMA (Federal Emergency Management Agency); matching funds for team members' time were also part of the funding formula.

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".¹*

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."²

HSEM's goal is to have all New Hampshire communities complete a local hazard mitigation plan as a means to reduce future losses from natural or human-caused 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 hazard mitigation plan.

The Wentworth Hazard Mitigation Plan Update 2014 is a planning tool to use to reduce future losses from natural and human-caused hazards as required by the Disaster Mitigation Act of 2000; this plan does not constitute a section of the Town's Master Plan, however mitigation action items from this Plan may be incorporated into future Master Plan updates.

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.

¹ Disaster Mitigation Act (DMA) of 2000, Section 101, b1 & b2

² Disaster Mitigation Act (DMA) of 2000, Section 322a

C. Jurisdiction

This Plan addresses one jurisdiction – the Town of Wentworth, NH.

D. Scope of the Plan & Federal & State Participation

A community's 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 wildfire/structure fires 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 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), 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 (hazard and wildfire/structure fire), 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 hazard mitigation planning process not only satisfies FEMA's criteria regarding wildfire/structure fires 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.³*

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.

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

E. Public & Stakeholder Involvement

Public and stakeholder involvement was stressed during the initial meeting and community officials were given a matrix of potential team members (page 17). Community officials were urged to contact as many people as they could to participate in the planning process, including not only residents but also officials and residents from surrounding communities; the Town of Wentworth understands that natural hazards do not recognize corporate boundaries.

It was noted that there is only one public elementary school (K-6) and no colleges in the Town of Wentworth; therefore stakeholders from academia were limited. However, by placing a Press Release (below) at the Post Office and Town Hall, many interested citizens and stakeholders had the opportunity to become aware of the hazard mitigation planning taking place in Wentworth. In addition, every meeting that was held was also video taped and posted for public viewing (see sample notice on following page).

The Planner sent an email to stakeholders that were recommended by the Team, including Emergency Management Directors, Police Chiefs and Fire Chiefs from neighboring towns (page 12). General announcements were also made on the Town’s website and “Upcoming Events” calendar.

*Mapping and Planning Solutions
P.O. Box 283
Twin Mountain, NH 03595*

Press Release

FOR IMMEDIATE RELEASE

November 15, 2012
Contact: June Garneau
603.846.5720

**TOWN OF WENTWORTH COMMENCES
HAZARD MITIGATION PLANNING UPDATE**

On November 14, the Wentworth Hazard Mitigation Team met with June Garneau, Mapping and Planning Solutions, and Paul Hatch, NH Homeland Security and Emergency Management, to discuss and begin planning the required five-year update to the 2009 Wentworth Hazard Mitigation Plan. As a result of these meetings, the Town of Wentworth will hold a series of Hazard Mitigation Planning meetings over the next few months.

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 hazard mitigation plan format will cover a variety of natural hazards and also address the history and likelihood of wildfire disasters, man-made hazards and the risks of building in flood zones.

Wentworth’s Planning Team is currently being formed; all interested parties should contact Jeffrey Ames, Fire Chief & Emergency Management Director, by phone at 764-9992, 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 Agency (FEMA).

The next scheduled meeting of the Planning Team will be held on Wednesday, January 9, 2013 at 6:00 PM the Wentworth Town Hall; the general public is encouraged to attend all meetings and to assist the Team with first-hand knowledge of historic hazard events.

Hazard mitigation planning is a preparedness tool. In an effort to reduce the costs of suppression and the incidence of potential losses, FEMA and New Hampshire Homeland Security and Emergency Management award local communities funding to assist in developing these plans. If you wish to have your community participate in this process please contact June Garneau at Mapping and Planning Solutions, 603.846.5720.

Upcoming Events

Today [Navigation] [Print]

Wednesday, March 20

- 10:00am Library Story Hour
- 6:00pm Hazard Mitigation Meetir

Monday, March 25

- 5:00pm School Board Meeting
- 6:00pm Library Trustees Meeting

Tuesday, March 26

- 6:00pm Selectmen's Meeting
- 6:15pm ★ Jeanne Forrester Legi

Wednesday, March 27

- 10:00am Library Story Hour

Sunday, March 31

- Easter

Monday, April 1

- April Fool's Day

Events shown in time zone: Eastern Time [Google Calendar]

Hazard Mitigation Meetings

There will be a Hazard Mitigation meeting on Wed, Jan 9 at 6 pm, all are welcome. Additional meetings:

- Wed, Feb 6 at 6 pm
- Wed, Mar 20 at 6 pm

Posted Mon., Jan. 07, 07:23 PM

Hi, Kenyon Karl!

Your video, [Wentworth-Hazmit-Update-2013-05-09](#), is ready to watch. [Share it](#) with friends, family, computer-savvy pets, and total strangers.

Wentworth-Hazmit-Update-2013-05-09
<http://vimeo.com/65892659>

Did you know you can add Looks and Music to your video using the incredible powers of the [Enhancer](#)? Check out some of these amazing Looks!

To the left and above:

- **Hazard Mitigation Meeting announcements;**
- **Town of Wentworth; website, <http://www.wentworth-nh.org/>**
- **Announcement of Wentworth Hazmit Update video.**

Below:

Sample meeting list attached to emails sent to NH EMD's, Police Chiefs, Fire Chiefs, Rangers and other State, Federal and Private Officials throughout the State on a monthly basis, including stakeholders for the Town.

New or changed Emergency Operations or Hazard Mitigation meetings; highlighted by "Counties". Status update: 3/15/13

<u>Day</u>	<u>Date</u>	<u>Time</u>	<u>Town/Location</u>	<u>Plan Type</u>	<u>HSEM Field Rep</u>	<u>County</u>
Monday	Mar 18	6:00 PM	Brookfield Town Offices	Hazmit	Heidi Lawton	Carroll
Tuesday	Mar 19	10:00 AM	Conway Town Offices	Hazmit	Heidi Lawton	Carroll
Tuesday	Mar 19	6:00 PM	Carroll Town Hall	Hazmit	Heidi Lawton	Coos
Wednesday	Mar 20	6:00 PM	Wentworth Town Offices	Hazmit	Paul Hatch	Grafton
Thursday	Mar 21	6:00 PM	Northumberland Town Offices	EOP	Heidi Lawton	Coos
Tuesday	Mar 26	6:00 PM	Landaff Town Hall	Hazmit	Paul Hatch	Grafton
Wednesday	Mar 27	10:00 AM	Stark Town Hall	EOP	Heidi Lawton	Coos
Friday	Mar 29	1:00 PM	Woodstock PSB	Hazmit	Paul Hatch	Grafton
Tuesday	Apr 2	3:00 PM	Wakefield PSB	EOP	Heidi Lawton	Carroll
Wednesday	Apr 3	6:00 PM	Wentworth Town Offices	Hazmit	Paul Hatch	Grafton
Friday	Apr 5	10:00 AM	Jackson Town Offices	Hazmit	Heidi Lawton	Carroll
Monday	April 8	7:00 PM	Randolph Town Offices	Hazmit	Heidi Lawton	Coos
Tuesday	April 23	6:00 PM	Carroll Town Hall	Hazmit	Heidi Lawton	Coos
Wednesday	May 1	9:00 AM	Colebrook Town Hall	Hazmit	Heidi Lawton	Coos
Wednesday	May 1	3:00 PM	Pittsburg Town Hall	Hazmit	Heidi Lawton	Coos

It was also noted that 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”. It is often very difficult to attract individual citizens to participate in town government and those that do generally hold full-time jobs and work as volunteers in a variety of town positions. With very small populations, the percent of interested citizens in the rural towns’ planning processes is extremely small. Due to the availability of jobs and other economic factors, the Town has a relatively high elderly population and a dwindling amount of young people with interest in politics.

§201.6(b) requires that there be an open public involvement process in the formation of a plan. This process shall provide an opportunity for the public to comment on the Plan during its formation as well as an opportunity for any neighboring communities, businesses, and others to review any existing plans, studies, reports, and technical information and incorporation of those in the Plan, to assist in the development of a comprehensive approach to reducing losses from natural disasters.

While much effort was made to promote public participation at the Wentworth hazard mitigation meetings, few general community members took the opportunity to participate. The citizens that did participate included the person responsible for video taping (Kenyon Karl attended every meeting and spoke often) and a mother and daughter (attended only one meeting and had no input). Comments made by Kenyan Karl were integrated into the narrative discussion and were incorporated into the essence of the document.

F. Incorporation of existing plans, studies, reports and technical information

The planning process included a complete review of the Wentworth Hazard Mitigation Plan of 2009 for updates, development changes and accomplishments. In addition, as noted in the Bibliography and in footnotes located throughout the Plan many other documents were used to create this mitigation plan. Some, but not all, of those plans and documents are listed as follows:

The Wentworth Hazard Mitigation Plan of 2009	Compare & Contrast
The Wentworth Master Plan	Future Development
Wentworth Annual Report, 2013.....	Structure Value Data
Area Hazard Mitigation Plans (Littleton, Easton, Sugar Hill)	Formats & Mitigation Ideas
The Wentworth Subdivision Regulations/Floodplain Ordinance.....	Floodplain Regulations
Census 2010 Data	Population Data
The NH DRA Summary of Inventory of Valuation MS-1 2012 for Wentworth	Structure Evaluation
The Economic & Labor Market Information Bureau Community Response	Population Trends
The American Community Survey (ACS 2008-2012).....	Population Trends
NH Forest Forests & Lands (DRED).....	DRED Fire Report
NH Office of Energy & Planning	Flood Losses
The NH Department of Revenue property tax valuation by property type.....	Property Information



Other technical manuals, federal and state laws as well as research data were combined with these elements to produce this integrated hazard mitigation plan. Please refer to the Bibliography in *Appendix A: Bibliography* and the Plan’s footnotes.

G. Hazard Mitigation Planning Process & Methodology

The planning process consisted of twelve specific steps; some steps were accomplished independently while other areas were interdependent. Many factors affected the ultimate sequence of the planning process such as the number of meetings, community preparation, attendance and other community needs. The planning process resulted in significant cross-talk regarding all types of natural and human-caused hazards by team members.

All steps were included but not necessarily in the numerical sequence listed. The list of steps is as follows:

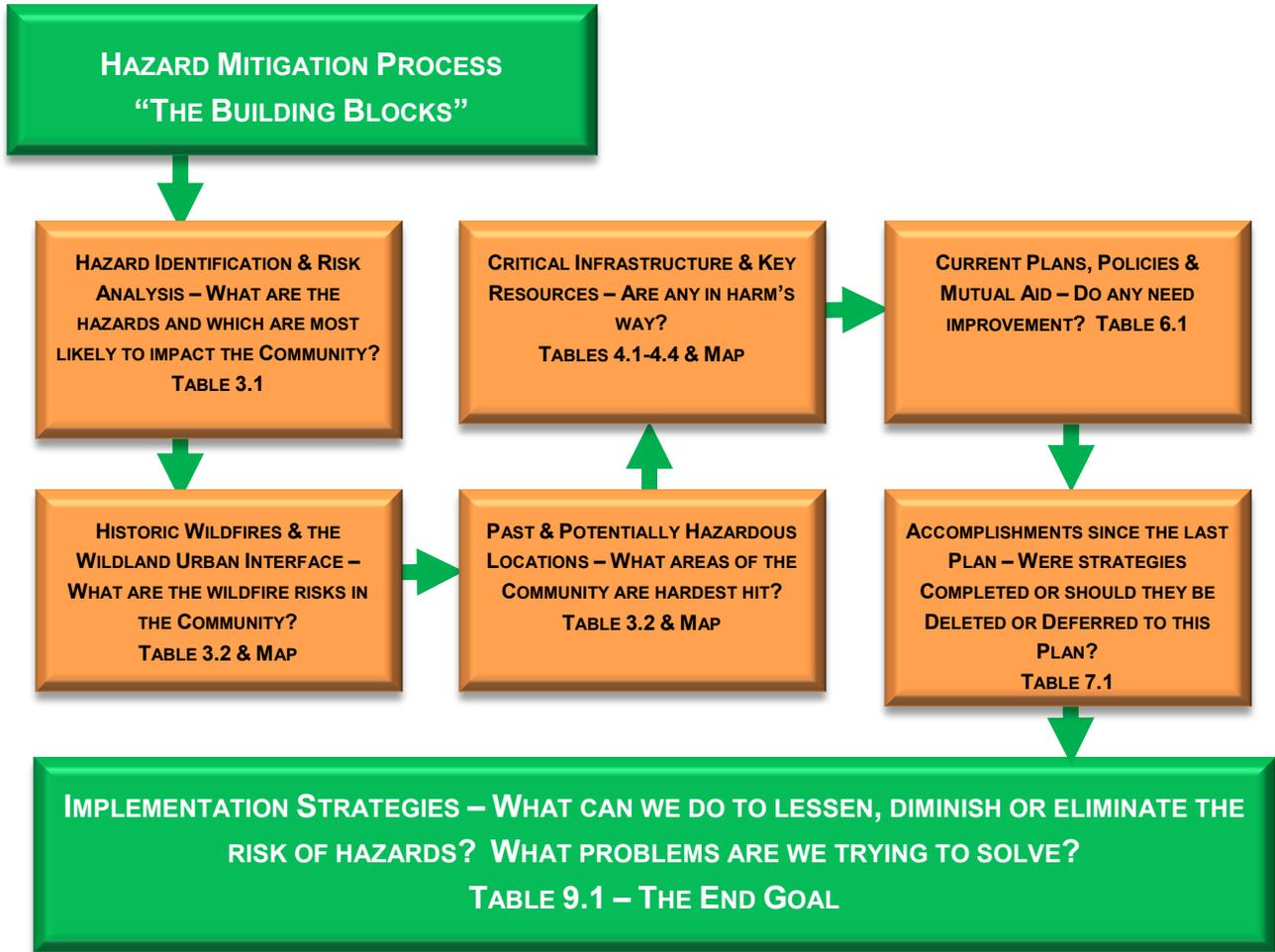
PLANNING STEPS

- Step 01: Team Formation and Orientation, Goal Identification
- Step 02: Formulate Hazards List, Hazards Description and Threat Matrix
Table 3.1 – Hazard Risk Analysis
- Step 03: Profile, List and Map Historic and Potential Hazards, Wildfire, Natural and Human-Caused
Table 3.2 – Historic and Potential Hazards
- Step 04: Profile, List and Map Critical Infrastructure and Key Resources
Tables 4.1 to 4.2 – Critical Infrastructure & Key Resources
- Step 05: Assess Community's participation in National Flood Insurance Program
Chapter 3, Section C
- Step 06: Gather Town History, Past Development Trends, Future Development Trends, Town Statistics
Chapter 2, Sections A, B and C and Table 2.1, Town Statistics
- Step 07: List Existing Mitigation Strategies & Brainstorm to Identify Potential Mitigation Strategies
Table 6.1 – Current Plans, Policies and Mutual Aid
- Step 08: Examine the mitigation strategies from the prior plan
Table 7.1 – Accomplishments since Prior Plan(s) Approval
- Step 09: Evaluate and Categorize Potential Mitigation Action Items
Tables 8.1 - Potential Mitigation Strategies & the STAPLEE
- Step 10: Prioritize Mitigation Action Items to Determine Action Plan
Table 9.1 – The Mitigation Action Plan
- Step 11: Team Review of Plan Contents for Submission to HSEM/FEMA
- Step 12: Adopt and Monitor the Plan

Using a “building block” approach, the base, or foundation, for the mitigation plan update was the prior plan. Each table that was completed had its starting point with the last hazard mitigation plan completed by the Community.

Ultimately, the “building blocks” lead to the final goal, the development of prioritized mitigation “action items” that when put into an action plan, would lessen or diminish the impact of natural hazards on the Town.

H. Hazard Mitigation Building Blocks & Tables



I. Hazard Mitigation Goals

Before identifying new mitigation actions to be implemented, the Team established and adopted the following broad hazard mitigation goals. The goals that are in the 2013 State of New Hampshire Multi-Hazard Mitigation Plan were reviewed as were the goals that were in the 2009 Wentworth Hazard Mitigation Plan. After discussing these goals, the Wentworth Hazard Mitigation Team (2014) agreed to the following goals for this Plan.

Community & Resource Protection

- To improve upon the protection of the general population, the citizens of Wentworth and visitors, from all natural and human-caused hazards.
- To reduce Wentworth’s potential exposure to risk with respect to natural and human-caused hazards.
- To minimize the damage and public expense which might be caused to public and private buildings and infrastructure due to natural and human-caused hazards.

Coordination & Communication

- To improve the Town of Wentworth's:
 - *Emergency preparedness and communication network.*
 - *Disaster response and recovery capability.*
- To identify, introduce and implement improvements to establish and maintain a reliable communication system.
- To improve communication capabilities so that the citizens of Wentworth can be notified in the most efficient manner as possible.
- To ensure that regular communication occurs between various departments and with local, regional and state officials and to have up-to-date plans in place to address various emergency situations and ensure that those involved are aware of their responsibilities.

Outreach & Education

- To build an awareness of public responsibility for hazard mitigation as well as steps that the Town is taking.
- To raise the awareness and acceptance of hazard mitigation opportunities through public education and outreach programs.
- To increase public awareness of the fire risk and the Town's potential liability with respect to wildfires.

Damage Prevention & Reduction

- To reduce the potential impact of natural and human-caused disasters on the Town of Wentworth's:
 - *Emergency Response Capability*
 - *Critical Infrastructure & Key Resources*
 - *Private property*
 - *Economy*
 - *Natural environment*
 - *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 Wentworth.*
- To identify, introduce and implement cost effective hazard mitigation measures so as to accomplish the Town's Goals and Objectives.
- To reduce the occurrence of road closures and road erosion due to localized flooding within the Town of Wentworth.

J. Narrative Description of the Process

The Plan was developed with substantial local, state and federal coordination; completion of this hazard mitigation 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.

Meeting 1, November 14, 2012

After waiting several months for the grant process to be complete, the first full meeting of the Wentworth Hazard Mitigation Team was held. Meeting attendance included Bobby Cass (Road Agent), Justine McComiskey (Student), Ellie Murray (Planning Board/Conservation), Francis Muzzey (Board of Selectmen), Kenyon Karl (Resident), Debi Gelsi (Resident), Megan Gelsi (Resident), Catherine Stover (Administrative Assistant), Jeffery Ames (EMD/Fire Chief), Kevin Kay (Police Chief), Paul Hatch (NH HSEM) and June Garneau (Mapping & Planning Solutions).

To introduce the Team to the planning process, June reviewed the evolution of Hazard Mitigation Plans, the funding, the 12 Step Process (handout), the collaboration with other agencies and the Goals (handout). The Team reviewed the standard goals that were in the 2009 Hazard Mitigation Plan and added two additional goals to represent their concern about localized flooding and the potential for wildfire. June also explained the need to sign-in, track time (handout) and to provide public notice to encourage community involvement. In addition, June provided the Team with a sample email that would be sent to “stakeholders” to invite them to take part in the planning process; the Team reviewed the email and suggested additional stakeholders to be added to the invitation list.

Work then began on *Table 2.1, Town Statistics*. Most of the work on this table was complete with the exception of a few items that June would either determine through GIS or get at a later date. There was some discussion about the population numbers in Wentworth; in general the Team felt that the data that had been obtained from the Census Bureau and the Economic and Labor Department Bureau’s Community Profile accurately represented the Town’s population.

Next on the Agenda were hazard identification and the completion of Table 3.1. After the hazards had been identified, the Team then assessed the risk severity and probability by ranking each hazard on a scale of 1-7 (7 being catastrophic) based on the following:

- The Human Impact Probability of Death or Injury
- The Property Impact Physical Losses and Damages
- The Business Impact Interruption of Service
- The Probability Likelihood of this occurring within 25 years

**HAZARDS MITIGATION
POTENTIAL TEAM MEMBERS**

FEDERAL
US Forest Service

STATE
Department of
Transportation
DRED
RC&D (Non-Profit)

LOCAL
Selectmen (Past/Present)
Town Manager/Administrator
Town Planner
Police Chief
Fire Chief
EMD
Emergency Services
Fire Warden
Health Services
Education/School
Recreation Directors
Public Works Director
Road Agent
Water Management
Public Utilities
Waste Management
Dam Operators
Major Employers

LOCAL - SPECIAL INTEREST
Land Owners
Home Owners
Forest Management
Timber Management
Tourism & Sportsman's
Groups
Developers & Builders

EXPERTS
GIS Specialists
Watershed Oversight
Environmentalists
Media

The rankings were then calculated to reveal the hazards which pose the greatest risks to the Community; 18 natural hazards and five human-caused hazards were identified. After analyzing these hazards using Table 3.1, local flooding caused by heavy rain, blizzard conditions and ice storms were designated as the primary concerns.

Having completed Table 3.1, the Team went on to provide descriptions of each hazard and how they could, or do, impact the Town of Wentworth specifically. In order to gain more knowledge of the impact of these hazards, June asked the Team to describe each hazard as it relates to Wentworth. For example, some of the questions asked were:

- How often do these hazards occur?
- Do the hazards damage either the roads or structures?
- Have the hazards resulted in loss of life?
- Are the elderly and special needs populations particularly at risk?
- What has been done in the past to cope with the hazards?
- Was outside help requested?
- Are the hazards further affected by an extended power failure?

In addition to bringing more awareness to the hazards, these questions provided information to further analyze the impact of the hazards on the Community. June noted that these descriptions would be used in Chapter 5.

Before adjourning the meeting, June thanked the Team for their work and assigned “homework” to the Team members. June also asked the Team to think about other hazardous events that have taken place since the last Plan and to begin thinking about Critical Infrastructure and Key Resources (CIKR).

The next meeting was scheduled for Wednesday, January 9, 2013.

Meeting 2, January 9, 2013

Meeting attendance included Ellie Murray, Kenyon Karl, Jeffery Ames, Kevin Kay, Steve Davis (Board of Selectmen) Paul Hatch and June Garneau

June reviewed the progress that was made at the last meeting and asked the Team to look at the Hazard Mitigation Goals again. After looking at the 2009 Plan and listening to the Team’s discussions, June added several additional goals to the list and reviewed the changes with the Team. After the discussing the Goals, the Team reviewed the work done at the previous meeting on Table 2.1; a handout was provided.

The Team then reviewed *Table 3.1, Hazard Identification & Analysis*, to see if the ranking of the hazards that was done at the last meeting still appeared to be correct; the Team concurred that the ranking of the hazards represented the risk to Wentworth fairly accurately.

Meeting 1 – November 14, 2012

1) Introduction

- a) Evolution of Multi-Hazard Plans & Community Wildfire Protection Plans
- b) Reason for Hazard Mitigation and Update
- c) Community involvement to educate emergency responders and citizens of the town about the dangers of hazards
- d) Devise a plan that: lessens, diminishes or completely eliminates the threat of Hazards to the Town

2) The Process

- a) Funding
- b) Review of 12 Step Process & The Team (handout)
- c) Collaboration with other Agencies (CWPP, NCRC &D)

3) Meetings

- a) Community Involvement - Public Notice, Press Release
- b) Stakeholders (handout)
- c) Signing In, Tracking Time, Agendas, Narrative (handout)

4) Today’s Topics

- a) Town Information (handout)
- b) Hazard Identification & Analysis (handout)
- c) Hazard Descriptions (time allowing)

5) Next Meeting

- a) Homework – Critical Infrastructure & Key Resources
- b) Digital Photos – contributions welcome

6) Schedule 3 More Meetings

- a) _____
- b) _____
- c) _____

Next on the agenda were *Tables 4.1–4.4, Critical Infrastructure and Key Resources (CIKR)*. The Emergency Response Facilities, the Non-Emergency Response Facilities, the Facilities & Populations to Protect and the Potential Resources from the 2009 Plan were examined and a few minor adjustments were made for this Plan. In addition, the evacuation routes, helicopter landing zones and bridges on the evacuation routes were defined. Lastly, each of the Critical Infrastructure and Key Resources were analyzed for their “Hazard Risk”.

Finally, the Team worked on *Table 7.1, Accomplishments since the Last Plan*. Having pre-populated the table with the implementation strategies from the 2009 Plan, June lead the Team through each strategy to determine which of these were “Completed”, should be “Deleted” or should be “Deferred” to this Plan as a new mitigation strategy. Many of the strategies from the 2009 Plan had been completed by the Town; several were deleted as they were felt to be no longer useful and/or emergency preparedness.

With time running out we were unable to complete this table. June reviewed the steps for the next meeting which was set for February 6, 2013.

Meeting 3, February 6, 2013

Meeting attendance included Francis Muzzey, Kenyon Karl, Jeffery Ames, Kevin Kay, Paul Hatch and June Garneau

The meeting began with an overall recap of the work that had already been done; although meeting attendance was light, a great deal of work was accomplished by this efficient Team. The recap included a brief look at each of the following completed tables:

- *Table 2.1 – Town Statistics*
- *Table 3.1 – Hazard Threat Analysis*
- *Tables 4.1-4.4 – Critical Infrastructure & Key Resources*
- *Table 7.1 – Accomplishments since the Last Plan*

This review helped the Team understand how each of these tables served as a building block for the final two tables, *Table 8.1, Potential Mitigation Strategies & the STAPLEE* and *Table 9.1, The Mitigation Action Plan*.

Before beginning new work, June brought the Team through Table 7.1 to insure that none of the Team’s objectives were lost in the translation from June’s notes to the table. Several minor changes were made during this review.

The next item on the Agenda was to look back at the Critical Infrastructure and Key Resources that had been identified in Tables 4.1-4.4. This step enabled the Team to think about each CIKR as it relates to hazards and to

Meeting 2 – January 9, 2013

1) Introductions & Review

- a) Last Meeting
 - i) Town Information, Table 2.1
 - ii) Hazard Identification, Table 3.1
 - iii) Hazard Descriptions – Natural Hazards

2) Today’s Topics

- a) Review Table 2.1 (handout)
- b) Review Table 3.1 (handout)
- c) Review the Goals (handout)
- d) Tables 4.1-4.4 Critical Infrastructure & Key Resources-taken from 2009 Plan (projection)
- e) Table 7.1-taken from 2009 Plan (projection)
- f) Table 6.1 taken from 2009 Plan (projection)

3) Homework

- a) Jot down any natural or man-made events that have taken place since 2007
- b) Jot down any new mitigation projects
 - i) Culverts?
 - ii) Generators?
 - iii) Changes in ordinances?
 - iv) Begin thinking about mitigation action items.

4) Next Meetings

- a) February 6, 2013, 6:00 PM
- b) March 20, 2013, 6:00 P

assign a risk level of 1-3 (3=high) depending on the likelihood of an event at that location. At this time, the Team also assisted June with the CIKR mapping.

Table 6.1, Current Plans, Policies & Mutual Aid, was next on agenda. Looking closely at the current mechanisms in place, the Team was able to determine whether the existing policies were effective or in “need of improvement”. It was explained to the Team that those items that needed improvement would become “new strategies” for this Plan and be discussed again when we got to our final table, *Table 9.1, The Mitigation Action Plan*

The Team began work on *Table 3.2, Historic Hazard Identification*, a list of past and potentially hazardous locations and/or events. First, they looked at the hazards that were listed in the last Plan and determined which they would like to see kept in this Plan.

The Team also examined the record of Presidential Disaster Declarations that have taken place in recent years, a record that shows substantial increase over past decades. At this point, the Team assisted June in mapping the hazards that were identified in *Table 3.2* for inclusion in *Map 3, Past & Potential Areas of Concern*.

While discussing past and potentially hazardous areas, June took the opportunity to explain the Wildland Urban Interface (WUI) and the Base Risk Analysis. Using GIS projection, June showed the Team *Map 1, Base Risk Analysis*, and explained the process that was used to develop the map. June explained that slope, type of fuel (i.e., softwood or hardwood) and exposure (southwest being the most susceptible) were analyzed in GIS to determine where the high, medium and low risk areas of the Town were. It was obvious in *Map 1, Base Risk Analysis* that the areas that are most susceptible to wildfire/structure fires are in the mountains of the Wentworth Range in the northwest part of the Town, part of the White Mountain National Forest.

Next, June discussed the Wildland Urban Interface (WUI) and projected a map of the Wildland Urban Interface over the Wentworth base layer and topography. The WUI was determined using GIS analysis to create a 300 foot buffer from the center line of all Class I-V roads and then an additional 1320 foot buffer from the first buffer (see *Map 2*). This area is determined to be the area in which the urban environment interfaces with the wildland environment and the area that is most prone to the risk of wildfire/structure fires. Using GIS analysis and a 1-foot aerial imagery (2011), June explained how she would determine the number of structures in the defined WUI. It should be noted that although the “WUI” was defined for the purpose of this Plan, many rangers and firefighters believe that towns with substantial wooded land, such as Wentworth, are entirely within the Wildland Urban Interface.

Meeting 3 – February 6, 2013

1) Introductions & Review

- a) Last Meeting
 - i) Reviewed Table 2.1
 - ii) Reviewed Table 3.1 (some changes)
 - iii) Reviewed the Goals
 - iv) Completed Tables 4.1-4.4 Critical Infrastructure & Key Resources
 - v) Began work on Table 7.1

2) Today's Topics

- a) Table 7.1-taken from 2009 Plan (continue working on)
- b) Table 6.1-taken from 2009 Plan (projection)
- c) Table 3.2-taken from 2009 Plan (projection)

3) Homework

- a) Review handouts provided by June
- b) Jot down any new mitigation projects
 - i) Culverts?
 - ii) Generators?
 - iii) Changes in ordinances?
 - iv) Begin thinking about mitigation action items.
- c) Send digital photos

4) Next Meeting

- a) March 20, 2013, 6:00 PM

Mitigation strategies were discussed to protect structures and to educate the Town’s citizens about the risk in the high risk and WUI areas. It was determined that the Town would acquire Firewise materials to have available at the Town Offices.

With time running out, it was decided to do work on tables 6.1 and 7.1 at the next meeting. The next meeting was set for March 20, 2013.

Meeting 4, March 20, 2013

Meeting attendance included Ellie Murray, Francis Muzzey, Kenyon Karl, Jeffery Ames, Kevin Kay, Paul Hatch and June Garneau

The meeting began with another look back at *Table 3.2, Past & Potential Hazardous Areas*. While much of the work had been done on this table at the last meeting, another look was in order as well as the mapping of the hazardous areas in Town. Using GIS projection, June and the Team were able to map the areas of Wentworth that were known to experience flooding on a regular basis.

To also tie up other loose ends, the Team took another look at Table 6.1 and 7.1. June had prepared these tables using notes from prior meetings to determine which current policies needed improvement and which strategies from the last plan needed to be deferred. Together with June, the team reviewed the language that was written to ensure that the concepts and ideas were maintained.

Finally, June provided the team with handouts that listed potential mitigation strategies, explained the STAPLEE proves and the ranking and prioritizing methodology (see Chapters 8&9).

The team was asked to jot down any mitigation ideas they might have and to bring them the next meeting which was set for May 9, 2013.

Meeting 5, May 9, 2013

Meeting attendance included Ellie Murray, Francis Muzzey, Kenyon Karl, Jeffery Ames, Kevin Kay, Paul Hatch and June Garneau

June projected the final pre-populated table for the Town’s review. This table, a combination of Table 8.1 and Table 9.1, enabled the Team to examine each strategy from Tables 6.1 and 7.1 that they had previously determined to be either in need of improvement or deferred for further action.

Using Table 9.1, the Team was now able to see and understand the “Action Items” for this hazard mitigation plan. Looking carefully at each “Action Item”, the Team was able to assign responsibility, the timeframe for completion, the type of funding that would be required and the estimated cost of the action. After much discussion and a careful review, ultimately, the Team settled on 33 “Mitigation Action Items” they felt were achievable and that would help to diminish the impact of natural hazards in the future.

Meeting 4 – March 20, 2013

1) Last Meeting
 a) Reviewed & made some changes to:
 i) Reviewed Table 3.1
 ii) Completed Tables 4.1-4.4 Critical Infrastructure & Key Resources
 iii) Completed Table 7.1

2) Today’s Topics
 a) Review Table 7.1
 b) Table 6.1-taken from 2009 Plan (projection)
 c) Table 3.2-taken from 2009 Plan (projection)

3) Homework
 a) Review handouts provided by June
 b) Jot down any new mitigation projects
 i) Culverts?
 ii) Generators?
 iii) Changes in ordinances?
 iv) Begin thinking about mitigation action items.
 c) Send digital photos

4) Next Meeting
 a) April 3, 2013, 6:00 PM

Meeting 5 – May 9, 2013

1) Last Meeting
 a) Reviewed Table 7.1
 b) Worked on Table 6.1
 c) Worked on Table 3.2

2) Today’s Topics
 a) Table 2.1
 i) Review Table 4.1
 ii) Tie up loose ends
 b) Review Table 3.2
 i) Wildfires Grouped?
 ii) Since 2010?
 iii) Tornadoes – delete?
 c) Review Table 6.1
 d) Develop Mitigation Action Items
 e) STAPLEE
 f) Ranking & Prioritizing

3) Homework
 a) TBD

4) Next Meeting
 a) _____
 b) _____

Next on the Agenda was the STAPLEE process, a systematic method used to gauge the quality of each of the Action Items. The Social (S), Technical (T), Administrative (A), Political (P), Legal (L), Economic (E) and Environmental (E) impact for each action item was discussed; this analysis then became Table 8.1. However, with time running out, it was decided to do the STAPLEE process at the next and final meeting which was scheduled for May 30, 2013.

Meeting 6, May 30, 2013

Meeting attendance included Ellie Murray, Kenyon Karl, Jeffery Ames, Kevin Kay, Paul Hatch and June Garneau.

The first order of business was the STAPLEE. After reviewing each Action Item using the STAPLEE process, the final scores ranged from 17-21, with 21 being the highest score. The average of all scores was 20.12.

Next, June reviewed the explanation of the ranking and priority methods (see Chapter 9) prior to beginning work on ranking and prioritizing. June organized the “Action Items” by ranking them from 0-3, roughly in order of timeframe, the Town’s authority to get the strategy accomplished and the STAPLEE score. The Team reviewed the ranking and made a couple of changes based on the expected timeframe.

Then within each rank, the Team assigned a priority; for example, if seven action items were ranked “1” then the priority rank was 1-7 (see explanation in Chapter 9). In this fashion, the Team was able to determine which action items were the most important within their rankings and in which order the action items would be accomplished.

With Tables 8.1 and 9.1 completed, the Team’s work was complete, with the exception of the final review. June agreed to put the final plan together and email a copy for the Town’s review. June explained the process from this point forward and thanked the Team for their hard work. No additional meeting was scheduled.

Meeting 6 – May 30, 2013

- 1) Last Meeting**
 - a) Tied up loose ends
 - b) Established mitigation action items
 - c) Reviewed STAPLEE and Priority Steps
- 2) Today’s Topics**
 - a) Review Match
 - b) Complete Table 9.1
 - i) STAPLEE
 - ii) Ranking & Prioritizing
- 3) Next Meeting**
 - a) Determine if necessary

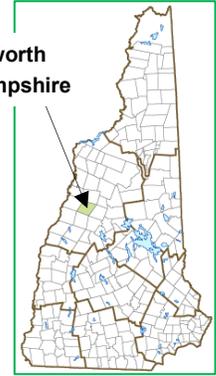
Documentation for the Planning process, including public involvement, is required to meet DMA 2000 (44CFR§201. (c) (1) and §201.6 (c) (1)). The Plan must include a description of the Planning process used to develop the Plan, including how it was prepared, who was involved in the process, and how other agencies participated. A description of the Planning process should include how the Planning team or committee was formed, how input was sought from individuals or other agencies who did not participate on a regular basis, what the goals and objectives of the Planning process were, and how the Plan was prepared. The description can be in the Plan itself or contained in the cover memo or an appendix.

Chapter 2: Community Profile

A. Introduction

Wentworth is located in Grafton County in the Dartmouth-Lake Sunapee Tourist Region in the mid-western part of New Hampshire. The Town is bordered by Warren to the north, Rumney to the east, Wentworth to the south and Orford to the west. The Town is probably most well-known for the Baker River and the mountains of the White Mountain National Forest.

Wentworth
New Hampshire



TOWN GOVERNMENT

A three-member Board of Selectmen governs the Town of Wentworth. The Town’s departments include, but are not limited to Fire, Police, Highway, Planning, Trust Funds, Cemetery, Moderator, Library and Conservation.

DEMOGRAPHICS & HOUSING

Over the last 30 years, the population of Wentworth has increased drastically; the population change from 1980 to 2010 showed an increase of 384 according to US Census 2010. Wentworth’s population in 2010 was estimated to be 911.

The American Community Survey (ACS) 2008-2012 estimates a total of 509 housing units, most of which are single family (432). Multiple-family structures total 19 and mobile homes and other housing units number 58. The median household income is estimated to be \$42,250 (ACS 2008-2012) and the median age is 50.3 years.

EDUCATION & CHILD CARE

Wentworth student’s grades 9-12 attend Pemi-Baker Regional High School which includes the towns of Wentworth, Ashland, Campton, Holderness, Plymouth, Rumney and Thornton. The Wentworth Elementary School (grades K-8, 59 students) is the only school in the Community. There are no child care facilities in Wentworth.

NATURAL FEATURES

The Town of Wentworth covers approximately 41.5 square miles of land area located in the scenic Dartmouth-Lake Sunapee Region of New Hampshire. Vegetation is typical of northern New England including both deciduous and conifer forests, open fields, swamp and riverine areas. Wentworth’s terrain lends itself to an abundance of lakes, ponds, streams and rivers, most notably, the Baker River.

TRANSPORTATION

There are three major roadways running through Wentworth. NH Route 25 and NH Route 118 run together and travel north-south through the Community; NH Route 25A travels west towards Orford and the Upper Valley.

Incorporated: 1766

Origin: This town was first chartered in 1766 to John Page and other, and named Wentworth, in honor of Governor Benning Wentworth. The grantees were given five years to meet the terms of the grants, and the majority were unable to do so, forfeiting their claim. In 1772, Asa Porter and others from Haverhill petitioned Governor John Wentworth, Benning’s nephew, for some of the forfeited shares, which was granted. Between them the Wentworth governors issued over 150 new town charters in New Hampshire, and nearly 130 new town charters in what is now Vermont, providing homes and farms of over 30,000 families.

Population, Year of the First Census Taken: 9241 residents in 1790

Population Trends: Population change for Wentworth totaled 609 over 52 years, from 300 in 1960 to 909 in 2012. The largest decennial percent change was a 40 percent increase between 1970 and 1980. The 2012 Census estimate for Wentworth was 909 residents, which ranked 190th among New Hampshire’s incorporated cities and towns.

Population Density and Land Area, 2010 (US Census Bureau): 22.0 persons per square mile of land area.

Source: NH Community Profiles; 2014; <http://www.nh.gov/nhes/elmi/html/profiles/Wentworth.html>

B. Emergency Services

EMERGENCY OPERATION CENTER

The Town of Wentworth maintains an Emergency Operations Center (EOC) as part of the Town's emergency preparedness program. The EOC is where department heads, government officials and volunteer agencies gather to coordinate their response to a major emergency or disaster event. The EOC is where the officials responsible for responding to major emergencies and disasters assemble to direct and control the jurisdiction's response. The EOC goes into operation when town officials decide that the situation is serious enough to require a coordinated and other-than-routine response.

In Wentworth the designated EOC is the Fire Station. Security and maintenance of the EOC facilities will be carried out in accordance with EOC Standard Operating Procedures (SOPs) to be developed by the EMD. If need be, the Town Offices will be used as a secondary EOC.

EMERGENCY MANAGEMENT DIRECTOR

The Emergency Management Director (EMD) works closely with all emergency response managers as the Town collectively prepares for and responds to emergencies. The EMD is located at the EOC and coordinates the community-wide response to the event.

THE WENTWORTH POLICE DEPARTMENT

The Police Department staffs five part-time sworn officers including a part-time Chief. Wentworth Police Officers are well-trained in the delivery of police services in an atmosphere of regional cooperation and have found value in working with other town and regional agencies, sharing resources, training and experience to provide a superior quality of life for the residents and visitors of Wentworth. The Wentworth Police Department has mutual aid agreements with all of their bordering towns.

THE WENTWORTH FIRE DEPARTMENT

The Wentworth Fire Department is a volunteer fire department providing quality fire services to the residents and visitors of Wentworth 24 hours a day, 365 days a year. The Department staffs a part-time Chief, 15 volunteer firefighters and operates one station within the Community. The Wentworth Fire Department participates in the Lakes Region Fire Mutual Aid along with area departments.

THE WENTWORTH HIGHWAY DEPARTMENT

The Wentworth Highway Department is a year-round, 24-hour as needed operation. The department staffs two employees, including a full-time Road Agent. The department's mission is to support the citizens of Wentworth through the safe operation, proper maintenance and future development of highway, supporting infrastructure and utilities in a manner that is cost conscience without sacrificing quality.

CODERED

The entire town is serviced by the CodeRED emergency alert system. Emergency response is dispatched through Grafton County Dispatch.

MEDICAL FACILITIES

Speare Memorial Hospital (16 miles, 25 beds) is the closest large healthcare facility. Cottage Hospital (27 miles, 25 beds) and Dartmouth-Hitchcock Medical Center (36 miles; 381 beds) are the next closest healthcare facilities.

WARREN-WENTWORTH AMBULANCE

Warren-Wentworth Ambulance is a year-round ambulance service operating 24-hour as needed. Warren-Wentworth Ambulance is comprised of twelve full-time employees, 5-6 volunteer on-call members, including the volunteer Director and three emergency vehicles. Warren-Wentworth Ambulance's mission is to provide primary responsibility for emergency medical services, rescue services and transportation in Warren, Rumney, Wentworth, parts of Wentworth and Glenclyff Home for the Elderly. Warren-Wentworth Ambulance provides medical transportation. The Warren-Wentworth Ambulance Service is a non-profit organization, which consists of great volunteers from the area and paid employees ranging from basics to paramedics.

EMERGENCY SHELTER(S)

The primary shelter is the location to which evacuees are directed at the time of an emergency. In Wentworth, the designated primary shelter is the Wentworth Elementary School. If the need arises and Wentworth Elementary School is not available, the Baker River Bible Church would be utilized as a secondary shelter depending on accessibility and the situation. Other potential shelters include the library and the fire station.

C. Wentworth's Current & Future Development Trends

Over the last 25 years, there have been several single-family subdivisions and single-family developments. There have also been few multi-resident dwellings constructed. South Oak Hill and South Wentworth have seen more growth than the rest of the Town. The American Community Survey (2008-2012) currently estimates a total of 477 housing units, which shows a slight decrease from the number of housing units indicated in the 2009 Hazard Mitigation Plan. Like the rest of New England, housing starts and development has been very slow since 2008.

No significant industrial growth, other than one major sawmill, has occurred over the last 25 years. Businesses in Wentworth include King Forest Lumber Co. (wood & lumber products), Precision Lumber (wood & lumber), Shawnee's (small grocery store) and Burning Bush (small hardware store).

It appears South Wentworth may be the most likely area for growth because of the availability of easily developed land. As the overall economy of the region grows, the Town anticipates more requests for subdivisions. The Planning Board anticipates these requests to continue and will closely monitor future building requests, especially those requested in flood and wildfire urban interface zones. The Planning Board will follow town building and subdivision regulations to ensure that any building in hazardous areas will be built to minimize vulnerability to the hazards identified in this Plan. There is no zoning in Wentworth. No development since 2009 has occurred in hazard prone areas and no development since 2009 has impacted the Town's hazard vulnerability.

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. Although the likelihood of substantial development in Wentworth is low, Town officials will continue to monitor any new growth and development, including new critical facilities, with regards to potentially hazardous events.

TABLE 2.1: TOWN STATISTICS

Table 2.1 - Town Statistics			Updated:	9/19/2013
Census Population Data	2010	2000	1990	1980
Wentworth, NH - Census Population Data	911	797	631	527
Grafton County	89,118	81,826	74,998	65,806
<i>Elderly Population-% over 65 (Census 2010)</i>	19.9%			
<i>Median Age (ACS 2008-2012)</i>	50.3			
<i>Median Household Income (ACS 2008-2012)</i>	\$44,600			
<i>Individuals below the poverty level (ACS 2008-2012)</i>	3.7%			
<i>Change in Population-Summer Weekend (%)</i>	33%			
<i>Change in Population-Winter Weekend (%)</i>	15.7%			
Regional Coordination				
<i>County</i>	Grafton			
<i>Regional Planning Commission</i>	North Country Council			
<i>Tourism Region</i>	White Mountains			
Municipal Services & Government				
<i>Town Manager</i>	No			
<i>Board of Selectmen</i>	Yes; Elected - Three Member Board			
<i>Planning Board</i>	Yes; Elected			
<i>School Board</i>	Yes; Elected			
<i>Zoning Board of Adjustment</i>	No			
<i>Conservation Committee</i>	Yes; Appointed			
<i>Master Plan</i>	1986			
<i>Planning Board Regulations</i>	Yes; 1986/2007			
<i>Emergency Operation Plan (EOP)</i>	Yes; 2000			
<i>Hazard Mitigation Plan</i>	Yes; March 11, 2009			
<i>Zoning Ordinances</i>	No zoning			
<i>Subdivisions Regulations</i>	Yes; Updated in 2007			
<i>Capital Improvement Plan</i>	No			
<i>Capital Reserve Funds</i>	Yes			
<i>Building Permits Required</i>	No			
<i>Flood Ordinance</i>	Yes; in Subdivision Regulations			
Percent of Local Assessed Valuation by Property Type-2012 (NH Department of Revenue)				
<i>Residential Buildings</i>	85.5%			
<i>Commercial Land & Buildings</i>	7.2%			
<i>Other (including Utilities)</i>	7.3%			
Emergency Services				
<i>Emergency Warning System(s)</i>	Code Red			
<i>Police Department</i>	Four part-time including Chief			
<i>Police Mutual Aid</i>	Mutual Aid Agreement with Rumney and Warren			
<i>Fire Department</i>	12 Volunteer part-time including the Chief			
<i>Fire Mutual Aid</i>	Lakes Region Fire Mutual Aid			

Table 2.1 - Town Statistics		Updated: 9/19/2013
<i>Fire Stations</i>	One	
<i>Fire Warden</i>	Yes	
<i>Emergency Medical Services</i>	Warren-Wentworth Ambulance Service (WWAS)	
<i>Established EMD</i>	Yes	
<i>Nearest Hospital</i>	Speare Memorial Hospital, Plymouth, 16 miles, 25 beds	
Utilities		
<i>Highway Department</i>	Yes; Full-time Road Agent; 1 full-time; 1 part-time helper	
<i>Water Department</i>	No	
<i>Public Works Mutual Aid</i>	No	
<i>Water Supply</i>	All private wells	
<i>Waste Water Treatment Plant</i>	All private septic	
<i>Electric Supplier</i>	NH Electric Coop	
<i>Natural Gas Supplier</i>	No	
<i>Cellular Telephone Access</i>	Limited	
<i>Public Access Television Station</i>	Yes; Channel 3 & Channel 20	
<i>High Speed Internet</i>	Limited; some on Time warner	
<i>Telephone Company</i>	Fairpoint & Time warner	
Transportation		
<i>Primary Evacuation Routes</i>	Route 25; last plan	
<i>Nearest Interstate</i>	I-93; Exit 26, 16 miles	
<i>Nearest Airport</i>	Plymouth Regional Airport; 2,380' turf; No lights; No nav aids	
<i>Nearest Commercial Airport(s)</i>	Lebanon Municipal; Lebanon, NH; 40 miles	
	Manchester-Boston Regional Airport, Manchester, NH; 76 Miles	
<i>Public Transportation</i>	No	
<i>Railroad</i>	No	
Housing Statistics (2010 Census)		
<i>Total Housing Units</i>	533	
<i>Occupied Housing Units</i>	382	
<i>Owner Occupied Units</i>	328	
<i>Renter Occupied</i>	54	
<i>Vacant Housing Units</i>	151 (122 for seasonal, recreational or occasional use)	
Other		
<i>Elementary School(s)</i>	1 K-8 (59 enrolled); Wentworth Elementary School	
<i>Middle School(s)</i>	Pemi-Baker Cooperative School District; Plymouth Regional High School	
<i>High School(s)</i>		
<i>School Administrative Unit</i>	SAU 48	
<i>Web Site</i>	www.wentworth-nh.org	
<i>Emergency Page</i>	No	
<i>Local Newspapers</i>	Record Enterprise (Plymouth)	
<i>Assessed structure value (2012)</i>	\$66,365,400	
<i>National Flood Insurance Program</i>	4/18/1983	

Table 2.1 - Town Statistics		Updated: 9/19/2013
Conserved Land as a Percent of Total Land		
***Approximate USFS-Owned land (%)	13.78%	
***Approximate Municipality-Owned land (%)	0.70%	
***Approximate State-Owned Land (%)	1.46%	
***Approximate Private-Owned Land (%)	2.08%	
***Approximate Total Conserved Land %	18.01%	
Fire Statistics**		
Wildfire Fire Calls (12)	2 Wildfire Calls	
Grafton County Fire Statistics (12)	59 Fires; 96.5 Acres Burned	
State Forest Fires FY (12)	318 Fires; 206 Acres Burned	
<i>*Information derived using GIS Analysis</i>		
<i>**Information derived from the NH Division of Forests and Lands, Fire Warden & State Forest Ranger Report, November 2012; http://www.nhdfi.org/fire-control-and-law-enforcement/fire-statistics.aspx and from Town of Wentworth</i>		
<i>Information found in Table 2.1, unless otherwise noted, was derived from the Economic & Labor Market Information Bureau, NH Employment Security, 2014. Community Response Received 6/18/12; http://www.nh.gov/nhes/elmi/htmlprofiles/pdfs/Wentworth.pdf and from the Town of Wentworth.</i>		



Wentworth Fire Station
 Photo Credit: MAPS

Chapter 3: Hazard Identification

A. Description of the Hazards

The first step in hazard mitigation is to identify hazards; the Team determined that thirteen natural hazards have potential to affect the Community. The hazards listed below and in Table 3.1 were classified based upon their relative threat score (as calculated in Column F in Table 3.1) and separated into three categories using Jenks' Optimization, which is also known as natural breaks classification. "*The natural breaks classification process is a method of manual data classification that seeks to partition data into classes based upon natural groups within the data distribution.*"⁴ By using this grouping process, the plan demonstrates each hazard's likelihood of occurrence in combination with its potential effect on the Town of Wentworth. This process illustrates a comprehensive hazard statement and assists the town with understanding which hazards should receive the most attention. Strict determination of the probability of occurrence is contained within Column D in Table 3.1; hazards are assessed based upon their likelihood of the hazard's manifestation within a 25 year period.

Natural hazards **most** likely to affect Wentworth:

- | | |
|---|---------------------------------------|
| 1) Flooding (local, riverine & 100-year events) | 3) Severe Winter Weather (ice & snow) |
| 2) High Winds (windstorms) | |

Natural hazards **most** likely to affect Wentworth:

- | | |
|--------------------------------------|------------------------------|
| 4) Thunderstorms & Lightning | 7) Wildfire |
| 5) Hurricane & Tropical Storms | 8) Downburst (macro & micro) |
| 6) Extreme Temperatures (hot & cold) | |

Natural hazards **most** likely to affect Wentworth:

- | | |
|--|-------------|
| 9) Earthquake | 12) Drought |
| 10) Mudslide, Landslide, Erosion (Erosion) | 13) Tornado |
| 11) Hailstorm | |

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 occurrence (based on a 25-year window).

Based on this analysis, the most likely natural disaster threat to Wentworth is Riverine Flooding due to heavy rain and rapid snow melt. The second most likely threat is High Winds and the third is Severe Winter Weather. However, it should be noted that six human-caused hazards were discussed by the Team including Extended Power Outage, Hazardous Material-Transport, Dam Failure, Epidemic & Pandemic, Hazardous Material-Fixed Location and Terrorism.

In light of recent events (Hurricanes Irene & Sandy), it should be noted that hurricanes can cause significant damage in Wentworth as a result of both wind strength and flash flooding creating road closures and damage. The Team indicated hurricanes as "may affect Wentworth" although the likelihood of high winds and heavy rains extending to north-central New Hampshire in most hurricane events is rare, as is the likelihood of high category hurricanes occurring in New England in general.

⁴ ESRI, <http://support.esri.com/en/knowledgebase/GISDictionary/term/natural%20breaks%20classification>

TABLE 3.1: HAZARD THREAT ANALYSIS

Table 3.1 - Hazard Threat Analysis						
Most likely to affect Wentworth.	<i>A natural hazard is a source of harm or difficulty created by a meteorological, environmental, or geological event.</i>					
May affect Wentworth.						
Less likely to affect Wentworth.						
Column	A	B	C	D	E	F
Scoring Probability	Probability of death or injury	Probability of Physical losses and damages	Probability of Interruption of service	Probability of this occurring within 25 years	Average of Human, Property & Business Impact	Relative Threat
1 = Very Low (0-20%)					Columns	
2 = Low (21-40%)					Columns	
3 = Moderate (41-60%)					A+B+C/3	
4 = High (61-80%)					D x E	
5 = Very High (81-100%)						
Natural Hazards	Human Impact	Property Impact	Business Impact	Probability	Severity	Risk Severity x Probability
1) Flooding (local, riverine & 100-year events)	2.00	3.00	3.00	4.00	6.00	24.00
2) High Winds (windstorms)	2.00	2.00	2.00	4.00	4.67	18.67
3) Severe Winter Weather (ice & snow)	1.00	2.00	2.00	4.00	3.67	14.67
4) Thunderstorms & Lightning	2.00	2.00	2.00	3.00	4.67	14.00
5) Hurricane & Tropical Storms	2.00	2.00	2.00	3.00	4.67	14.00
6) Extreme Temperatures (hot & cold)	2.00	1.00	1.00	4.00	3.33	13.33
7) Wildfire	1.00	2.00	1.00	3.00	3.33	10.00
8) Downburst (macro & micro)	1.00	2.00	2.00	2.50	3.67	9.17
9) Earthquake	1.00	2.00	2.00	2.00	3.67	7.33
10) Mudslide, Landslide, Erosion (Erosion)	1.00	2.00	1.00	2.00	3.33	6.67
11) Hailstorm	1.00	2.00	1.00	2.00	3.33	6.67
12) Drought	1.00	1.00	1.00	2.00	2.33	4.67
13) Tornado	1.00	2.00	2.00	1.00	3.67	3.67
Human-caused Hazards	Human Impact	Property Impact	Business Impact	Probability	Severity	Risk Severity x Probability
1) Extended Power Outage	3.00	2.00	2.00	5.00	2.33	11.67
2) Hazardous Material - Transport	2.00	2.00	1.00	3.50	1.67	5.83
3) Dam Failure (4 dams)	2.00	4.00	2.00	2.00	2.67	5.33
4) Epidemic & Pandemic	3.00	1.00	1.00	2.00	1.67	3.33
5) Hazardous Material – Fixed Location	1.00	1.00	1.00	2.00	1.00	2.00
6) Terrorism	3.00	2.00	1.00	1.00	2.00	2.00

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, 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 all of 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 Wentworth, Grafton County and the State 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 a base-map of the Town, see *Appendix G: Map Documents, Map 1: Base Risk Analysis*

C. Wentworth National Flood Insurance Program (NFIP) Status

Wentworth has been a member of the National Flood Insurance Program since April 18, 1983. Wentworth has approximately 2.05 square miles of land in the 100-year floodplain, .50 square miles of which is inland water. The floodplain areas of Wentworth are primarily along the Baker River, the South Branch Baker River and Pond Brook; there are other small streams and brooks throughout the Town that may also experience flooding. According to the latest D-Firm, there is also a small 50-year flood zone within Wentworth.

According to the NH Office of Energy and Planning, a total of two claims have been paid for a total amount of \$8,839; there have been no repetitive losses in the Town of Wentworth.⁵ The location of structures that lie within the floodplain as well as the floodplain itself can be seen on *Map 3, Past & Potential Areas of Concern*, located in *Appendix G: Map Documents*, of this Plan.

Severe Repetitive Loss (SRL) Properties--NFIP-insured buildings that, on the basis of paid flood losses since 1978, meet either of the loss criteria described on page SRL 1. SRL properties with policy effective dates of January 1, 2007, and later will be afforded coverage (new business or renewal) only through the NFIP Servicing Agent's Special Direct Facility so that they can be considered for possible mitigation activities. Source: <http://www.fema.gov/national-flood-insurance-program/definitions#R>

Wentworth adopted the "Town of Wentworth Floodplain Management Ordinance" as part of the Town's Subdivision Regulations. The Floodplain Management Ordinance states "*This ordinance, adopted pursuant to authority of RSA 674:16, shall be known as the Town of Wentworth Floodplain Management Ordinance. The following regulations shall apply to all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its "Flood Insurance Study for the Town of Wentworth, N.H."* together with the associate Flood Insurance

⁵ NH Office of Energy & Planning; Jennifer Gilbert

Rate Maps, and Flood Boundary & Floodway Maps of the Town dated April 18, 1983, which are declared to be a part of this ordinance and are hereby incorporated by reference, and any subsequent revisions thereto.”⁶ The latest Flood Insurance Rate Maps for the Community were completed on February 20, 2008; the most recent Flood Insurance Study (FIS) was also completed on February 20, 2008.

The ordinance goes on to state in its “Purpose” that “Certain areas of the Town of Wentworth, New Hampshire, are subject to periodic flooding, causing serious damage to properties within these areas. Relief is available in the form of flood insurance as authorized by the National Flood Insurance Act of 1968. Therefore, the Town of Wentworth, New Hampshire, has chosen to become a participating community in the National Flood Insurance Program, and agrees to comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-488, as amended) as detailed in the Flood Management Ordinance. This Ordinance establishes a permit system and review procedure for development activities in the designated flood hazard areas of the Town of Wentworth, New Hampshire.”

In 1968, although well-intentioned government flood initiatives were already in place, Congress established the National Flood Insurance Program (NFIP) to address both the need for flood insurance and the need to lessen the devastating consequences of flooding. The goals of the program are twofold: to protect communities from potential flood damage through floodplain management, and to provide people with flood insurance.

For decades, the NFIP has been offering flood insurance to homeowners, renters and business owners, with the one condition that their communities adopt and enforce measures to help reduce the consequences of flooding. Source: http://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp

Other elements of the Wentworth Floodplain Management Ordinance include: Item I-Definitions, Item II-Permits, Item III-Construction Requirements, Item IV-Water and Sewer Systems, Item V-Certification, Item VI-Other Permits, Item VII-Watercourses, Item VIII-Special Flood Hazard Areas and Item IX-Variations and Appeals.

As a very small and close-knit community, the Wentworth Board of Selectmen and the Hazard Mitigation Planning Team are most always aware of new construction and/or substantial improvements that take place in town. Although Wentworth has a relatively small designated Special Flood Hazard Area, the Team felt that it is worthwhile to have NFIP brochures and information available at the Town Office for current homeowners and potential developers (see Mitigation Strategy #27, Tables 8.1 & 9.1).

The Town of Wentworth, through its Floodplain Management and other best practices, complies with the National Flood Insurance Program requirements. The Team also understands that

Planning Board Regulations Approved February 5, 2007
FEMA Regulations Approved March 13, 2007

SUBDIVISION REQUIREMENTS

PLANNING BOARDS IN NFIP PARTICIPATING COMMUNITIES MUST ADOPT THE FOLLOWING REQUIREMENTS AS PART OF THE BOARD SUBDIVISION REGULATIONS

Requirements for subdivisions having land designated as “Special Flood Hazard Areas” (SFHA) by the National Flood Insurance Program (NFIP)

- A. The Planning Board shall review the proposed development to assure that all necessary permits have been received from the government agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U. S. C. 1334.
- B. The Planning Board shall require that all subdivision proposals greater than 50 lots or 5 acres, which ever is the lesser, include Base Flood Elevation (BFE) data within such proposals (i.e. floodplain boundary and 100-year flood elevation).
- C. The Planning Board shall require the applicant to submit sufficient evidence (construction drawings, grading and land treatment plans) so as to allow a determination that:
 - (i) all such proposals are consistent with the need to minimize flood damage;
 - (ii) all public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize flood damage, and,
 - (iii) adequate drainage is provided so as to reduce exposure to flood hazards.

⁶ Town of Wentworth Floodplain Management Ordinance

the benefits of the NFIP also extend to structures that are not in the 100-year floodplain. The Town will continue to work with the Office of Energy and Planning and will carefully monitor its continued compliance with the NFIP.

D. Profile of Past, Present & Potential Wildfire/Structure Fire Events in Wentworth

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.

The Wentworth Planning Team noted that very few significant wildfires have occurred in Wentworth in the recent past but that many of the Community's residences are located in the Wildland Urban Interface (WUI). It was noted that if the right conditions were in place, a large wildfire could occur. Wentworth's forested lands include many of the factors associated with potential wildfire including steep terrain, a significant softwood forest and large areas where clear cuts and blow downs have occurred. In addition, there is a limited municipal water supply in Wentworth so the fire department must rely on static water sources to fight fires.

The Town reported "56 fire calls in 2013 ranging from several tree and wires down calls to motor vehicular accidents and fires"; none of these were significant wildfires.⁷

E. Probability of Future Potential Disasters

Due to Wentworth's geographic location, forested lands, steep hills, heavy snow pack and topography, there is always a possibility of future disasters in Wentworth. The Town of Wentworth has been impacted in the past by natural disasters, including flooding, river ice jams, lightning, severe winter storms, severe wind and tropical storms. In addition, the potential exists for tornado and earthquake damage although there is no record of these events striking the Town.

FLOODING (LOCAL, RIVERINE, 100-YEAR EVENTS)

Flooding from heavy rain is a common occurrence in Wentworth's, particularly along many of the Town's roadway. Using GIS analysis, it was determined that 39 structures fall within the FEMA flood zone (not including 16 CIKR which are either bridges, hydrants or landing zones), but equally, if not more important, are Wentworth's 45 miles of roads. Heavy rains, saturated ground and rapid snowmelt create overburdened culverts, road washouts and road closures. It is likely that the future will bring more riverine flooding along the Baker River and road flooding due to the large number of gravel roads (36 miles) and the number of culverts that are either undersized or aging.

HIGH WINDS (WINDSTORM)

High Winds as isolated events are also common as are high winds resulting from severe winter storms, downbursts, hurricanes and thunder and lightning storms. Wentworth's location in the White Mountains and the elevation and steepness of its terrain combined with the occurrence of high winds, can potentially create large areas of downed trees, blocked roads, structure damage, power outages and inaccessibility for emergency responders. The 1938 hurricane is remembered for structural damage although more for the downed trees and road blockages that resulted.

⁷ Town of Wentworth, NH, Annual Report 2013, Page 30

SEVERE WINTER STORMS (SNOW & ICE)

Severe winter weather events, particularly ice storms, are felt to pose a high risk to the people of Wentworth. It is not uncommon for snow storms to unload 2-3 feet of snow in a single storm; fortunately with this common occurrence also comes a vast knowledge of how to deal with the situation. In fact, large snowstorms with heavy accumulation are generally handled quite well by the Wentworth Highway Department and are often welcomed by outdoor winter recreationists.

Ice storms on the other hand pose a serious threat as they are unpredictable, can create a mass amount of damage and result in long-lasting power outages. Much of the Town is above 1,000 feet above sea level and therefore very susceptible to ice storms and the subsequent damage they can cause; elevations in Wentworth range from approximately 630' at the lowest point to 3,453' at the top of Carr Mountain. Fortunately, the ice storms of 1998 and 2008 had no significant impact in Wentworth, but the probability of future ice storms is good. Combined with a small number of access roads in and out of Town, ice storms create accessibility and isolation concerns for the citizens of Wentworth and make emergency response extremely difficult.

Any potential disaster in Wentworth is particularly impactful if combined with power failure, as would most likely be the case with severe winter storms, blizzards and ice storms. The food supply of individual citizens could become depleted quickly should a power failure last for a week or more. An outage during the winter months could result in frozen pipes and the lack of water and heat, a particular concern for the Town's elderly citizens (19.9% of the population). In addition, winter in New England commonly brings very low temperatures, while high temperatures can be experienced in the summer.

The road system which passes through Wentworth, with the exception of US Route 25, primarily consists of slow country roads and/or dirt roads. These dark, narrow, winding and bumpy roads are beautiful in the spring, fall and summer months, but when affected by flooding, winter snow conditions and ice they become treacherous. In these conditions, vehicular accidents, wildlife collisions and truck accidents involving hazardous materials are always a possibility.

Table 3.1, Table 3.2 and Chapter 5, Section B provide more information on past and potential hazards in Wentworth.

Ice Jam on the Baker River
Photo Credit: Town of Wentworth

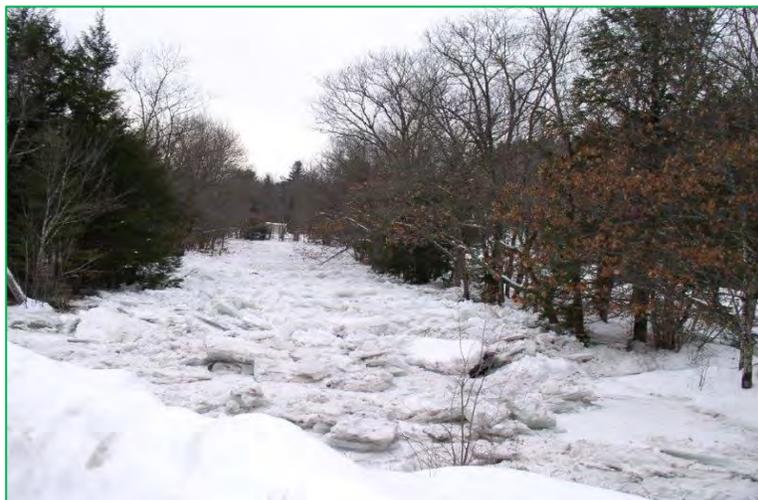


TABLE 3.2: HISTORIC HAZARD IDENTIFICATION

2009 HMPT = 2009 Hazard Mitigation Planning Team

2014 HMPT = 2014 Hazard Mitigation Planning Team

Type of Event	Date	Location	Impact	Source
<p>Past Flooding Hazards: Riverine flooding is the most common disaster event in the State of New Hampshire (aside from frequent inconveniences from rather predictable moderate winter storms). Significant riverine flooding impacts upon some areas in the State in less than ten year intervals. The entire State of New Hampshire has a high flood risk. Areas prone to flooding and road erosion are indicated on Map 3.</p>				
Flooding	1927	Wentworth	Flood damage resulted in permanently closed road at the Railroad Depot (currently King Lumber)	2014 HMPT
Severe Storms & Flooding	October 2005	Belknap, Cheshire, Grafton, Hillsborough, Merrimack & Sullivan	Presidential Disaster Declaration (DR-1610): To date, state and federal disaster assistance reached more than \$3 million to help residents and business owners in New Hampshire recover from losses resulting from the severe storms and flooding in October; no significant impact in Wentworth.	FEMA & 2014 HMPT
Severe Storms & Flooding	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	Presidential Disaster Declaration: DR-1643: Flooding in most of southern NH, May 12-23, 2006; "Mother's Day Flood"; no significant impact in Wentworth.	FEMA & 2014 HMPT
Nor'easter, Severe Storms & Flooding & Landslide	April 15, 2007	All Ten	Presidential Disaster Declaration (DR-1695): Flood damages; FEMA & SBA obligated more than \$27.9 million in disaster aid following the April nor'easter; in Wentworth, culverts were washed out; "Tax Day Flood".	FEMA & 2009 HMP
Severe Storms & Flooding	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	Presidential Declaration (DR-1787): Severe storms, tornado and flooding on July 24, 2008; no significant impact in Wentworth.	FEMA & 2014 HMPT
Severe Winter Storm, Rain & Flooding	February 23 - March 3, 2010	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Presidential Disaster Declaration (DR-1892): Flood and wind damage to most of southern NH including six counties; 330,000 homes without power; more than \$2 million obligated by June 2010; no significant impact in Wentworth.	FEMA & 2014 HMPT
Severe Storms & Flooding	May 26-30, 2011	Coos & Grafton County	Presidential Disaster Declaration (DR-4006): May Flooding Event, May 26th-30, 2011 in Coos & Grafton County; this severe rain and thunderstorm event dropped hail and several inches of rain throughout the North Country resulting in many road washouts; no significant impact in Wentworth.	FEMA & 2014 HMPT

Type of Event	Date	Location	Impact	Source
Flooding/Ice Jams	Past & Potential	North Wentworth Road, Rowentown Road area	Flooding as a result of ice jams on the South Branch Baker River has caused flooding on North Wentworth Road (Route 118) and in the Rowentown Road area; some properties were affected; culverts in the area underperform.	2014 HMPT
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. Wildfires that were in the 2009 Plan are indicated on Map 2.				
Wildfire	Oct-47	Ellsworth Hill Road & Johnson Road area	Wildfire in Ellsworth Hill Road/Johnson Road Area; class and cause unknown; fire lasted three weeks.	2009 HMPT
Wildfire	1990s	Multiple Locations	19 Class A Fires (11 of which were at the dump, 1 downed power line, 1 permitted debris burning, 3 unpermitted debris burning, 1 kids playing with rockets, 1 lightning strike, 1 unknown cause) & no Class B or higher Fires	2009 HMPT
Wildfire	2000s	Multiple Locations	2 Class Unknown Fires, 17 Class A Fires (3 miscellaneous cause, 4 downed power lines, 1 lightning strike which rekindled, 1 campfire, 1 ashes dumped from campfire, 1 ashes dumped from wood fire boiler, 1 cigarette side of road, 1 metal cutting, 1 out-of-control permitted fire, 1 permitted debris burning, 1 unpermitted debris burning) & 8 Class B fires (1 campfire, 1 arson/suspicious, 1 child playing with matches, 1 lightning strike, 1 cigarette, 2 permitted debris burning, 1 unpermitted debris burning)	2009 HMPT
No significant wildfires were reported by the 2014 Hazard Mitigation Planning Team				
Past or Potential High Wind Events: Hurricanes, Tropical Storms, Tornado, Downburst, Microburst & Windstorms: Tornadoes 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. These hazards were not mapped.				
Hurricane Katrina Evacuation	August 29-October 1, 2005	All Ten NH Counties	Presidential Emergency Declaration (EM-3258): Assistance to evacuees from the area struck by Hurricane Katrina and to provide emergency assistance to those areas beginning on August 29, 2005 and continuing; The President's action makes Federal funding available to the State and all 10 counties of the State of New Hampshire; no impact on Wentworth.	FEMA & 2014 HMPT
Hurricane Irene (Tropical Storm Irene when it reached Wentworth)	August 26-September 6, 2011	All Ten NH Counties	Presidential Disaster Declaration (DR-4026); Presidential Emergency Declaration (EM-3333): Presidential & Emergency Declaration for Tropical Storm Irene for in all ten counties; Tropical Storm Irene Aug 26th- Sept 6, 2011; Tropical storm Irene heavy rains, caused flooding and road closures; power outages; road washouts, Frescoln Road gone, Athletic Fields flooded and eroded and covered with silt deposit; major property damage; erosion issues on Baker River; every tributary in Town overflowing; Rowentown Road; Crossroad Bridge breached.	FEMA & 2014 HMPT

Type of Event	Date	Location	Impact	Source
Hurricane Sandy	October 26-31, 2012	All Ten NH Counties (EM) & Belknap, Carroll, Coos, Rockingham, Grafton & Sullivan (DR)	Presidential Disaster Declaration (DR-4095); Presidential Emergency Declaration (EM-3360): Hurricane Sandy came ashore in NJ and brought high winds, power outages and heavy rain to NH; all ten counties in the State of New Hampshire; The Presidential Declaration covers damage to property from the storm that spawned heavy rains, high winds, high tides and flooding over the period of October 26-November 8, 2012; high wind, trees downs, debris, power outages, no major flooding in Wentworth.	FEMA & 2014 HMPT
Tornado	July 2009	Wentworth	Tornado Watch given to Wentworth, a tornado however was not actually seen in town.	2014 HMPT
Past or Potential Severe Winter Weather Hazards: Severe winter weather in New Hampshire may include heavy snow storms, blizzards, Nor'easters and ice storms (particularly at elevations over 1,000 feet). 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 were not mapped.				
Snow	1968-69	Wentworth, NH, New England & New York	The winter of 1968-69 brought record amounts of snow to all of NH and to Wentworth; Pinkham Notch at the base of Mount Washington recorded more than 75" of snowfall in a four day period at the end of February 1969 in addition to snow that had already fallen; all of NH, including Wentworth, had difficulty with snow removal because of the great depths that had fallen from December 1968 to April 1969.	2014 HMPT
Snowstorm	March 5-7, 2001	Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Strafford	Presidential Emergency Declaration (EM-3166): Declaration covers jurisdictions with record and near-record snowfall from the late winter storm that occurred March 2001; no significant impact on Wentworth.	FEMA & 2014 HMPT
Snow	December 6-7, 2003	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan	Presidential Emergency Declaration (EM-3193): The declaration covers jurisdictions with record and near-record snowfall that occurred over the period of December 6-7, 2003; no significant impact on Wentworth.	FEMA & 2014 HMPT
Snow	January, 22-23; February 10-11 & March 11-12, 2005	Belknap, Carroll, Cheshire, Grafton, Hillsborough, Rockingham, Merrimack, Strafford & Sullivan	Presidential Emergency Declarations (EM-3207, EM-3208; EM-3208-002; EM-3211): The Federal Emergency Management Agency (FEMA) had obligated more than \$6.5 million to reimburse state and local governments in New Hampshire for costs incurred in three snow storms that hit the state earlier that year, according to disaster recovery officials. Total aid for all three storms is \$6,892,023.87 (January: \$3,658,114.66; February: \$1,121,727.20; March: \$2,113,182.01); no significant impact on Wentworth.	FEMA & 2014 HMPT

Type of Event	Date	Location	Impact	Source
Severe Winter Storm & Ice Storm	December 11, 2008	All Ten NH Counties	Presidential Declaration (DR-1812); Presidential Emergency Declaration (EM-3297): Damaging ice storms to entire state including all ten NH counties; fallen trees and large scale power outages; five months after December's ice storm pummeled the region, nearly \$15 million in federal aid had been obligated by May 2009; no significant impact on Wentworth.	FEMA & 2014 HMPT
Severe Winter Storm	March 2008	Wentworth	This severe late-winter storm brought additional heavy wet snow combined with rain to all of NH; three roofs collapsed on Rowentown Road in Wentworth;	2014 HMPT
Severe Storm	October 29-30, 2011	All Ten - check for DR number as well	Presidential Emergency Declaration (DR 4049); Emergency Declaration (EM-33344): Severe storm during the period of October 29-30, 2011. - All ten counties in the State of New Hampshire; "Snow-tober"; no significant impact on Wentworth.	FEMA & 2014 HMPT
<p>Past or Potential Earthquake Hazards: According to the NH State Hazard Mitigation Plan, New Hampshire is considered to lie in an area of "Moderate" seismic activity when compare to other areas of the United States and is bordered to the North and Southwest by areas of "Major" activity. Generally, earthquakes in NH cause little or no damage and have not exceeded a magnitude 5.5 since 1940. These hazards were not mapped.</p>				
Earthquakes	December 1940 (2)	Ossipee, NH	Magnitude 5.5 felt in two separate earthquakes	See References Below
Earthquakes	1947, 1951, 1957, 1962, 1973, 1982	New England	Small earthquakes felt in New England measuring from 4.2 to 4.7 magnitude	
Earthquakes	October 2012	Northern New England	An earthquake measuring 4.6 on the Richter Scale with an epic center in Hollis, ME (just over the NH line) was felt throughout New Hampshire and as far south as Rhode Island; buildings shook for 10-30 seconds but no damage was reported however the tremor was felt in Wentworth	2014 HMPT
<p>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 were not mapped.</p>				
Drought	1929-1936	Town & State Wide	Regional	See References Below
Drought	1939-1944	Town & State Wide	Most severe in southeast	
Drought	1947-1950	Town & State Wide	Moderate	
Drought	1960-1969	Town & State Wide	Regionally, longest recorded continuous spell of less than normal precipitation	
Drought	2001-2002	Town & State Wide	Third worst drought on record	

Type of Event	Date	Location	Impact	Source
<p>Other Past or Potential Hazards: Human-caused 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. These hazards are not mapped.</p>				
Thunderstorms & Lightning			<p>Although the Team did not identify specific examples of past occurrences of these natural hazards, it was felt worthwhile to list them as potential hazards to the Town. See Hazard Threat Matrix (Table 3.1) and Chapter 5 for more details on these hazards.</p>	
Extreme Temperatures				
Downbursts (macro & micro)				
Mudslide, Landslide, Erosion (Erosion)				
Hailstorm				

*Historic hazard events were derived from the following sources unless noted otherwise:

- Website for NH Disasters: <http://www3.gendisasters.com/mainlist/newhampshire/Tornadoes>
- FEMA Disaster Information: <http://www.fema.gov/disasters>
- The Tornado Project: <http://www.tornadoproject.com/alltorns/nhtorn.htm>
- The Tornado History Project: <http://www.tornadohistoryproject.com/>
- The Disaster Center (NH): <http://www.disastercenter.com/newhamp/tornado.html>
- <http://www.Earthquaketrack.com>

For more information on state & county-wide past events, see *Appendix D: Presidential Disaster and Emergency Declarations*.



Wentworth Flooding, Tropical Storm Irene
 Photo Credit: Town of Wentworth

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Chapter 4: Critical Infrastructure & Key Resources (CIKR)

With Team discussion and brainstorming, Critical Infrastructure and Key Resources (CIKR) within Wentworth were identified and mapped for this Plan. The “ID” number in the following lists is also represented as a CIKR in *Appendix G: Map Documents, Map 4: Critical Infrastructure and Key Resources*. Facilities located in adjacent towns were not mapped (NM). The Hazard Risk rating was based on a scale of 1-3 with 1 indicating little or no risk.

TABLE 4.1 - EMERGENCY RESPONSE FACILITIES (ERF) & EVACUATION

EMERGENCY RESPONSE FACILITIES (ERF)				
ERF'S are primary facilities and resources that may be needed during an emergency response.				
Map ID#	Facility	Type of Facility	Hazard Risk	
1	Town Offices	Records	All Hazards	1
	Police Station	Police Department		
2	Fire Station	Fire Department & Emergency Operations Center (EOC); Siren	All Hazards	1
3	Highway Public Works Garage	Heavy Equipment, Sand & Gravel	All Hazards & Flooding	2
4	Wentworth Elementary School	Primary Shelter	All Hazards	1
5	State DOT Garage (for 1st Responders, has generator)	Emergency Diesel & Gas	All Hazards	1
NM	Speare Memorial Hospital (Plymouth)	Hospital	All Hazards	1
NM	Dartmouth Hitchcock Medical Center(Lebanon)	Hospital (secondary)	All Hazards	1
NM	Warren/Wentworth Ambulance (Warren)	Emergency Medical Services	All Hazards	1
NM	Grafton County Dispatch (Police/911)	Communications	All Hazards	1
NM	Lakes Region Fire Mutual Aid	Communications	All Hazards	1
Hydrants (dry & live)				
6	Zoe Road	Dry Hydrant/Fire Pond	All Hazards	1
7	Cape Moonshine Road	Dry Hydrant	All Hazards	1
8	John King's Gravel Pit	Dry Hydrant	All Hazards & Flooding	3
9	King Forest Industries	Live Hydrant	All Hazards & Flooding	2
10	Precision Industries	Live Hydrant	All Hazards & Flooding	3
Helicopter Landing Zones				
Map ID#	Facility	Type of Facility	Hazard Risk	
11	Peterson Airport (Private)	Airstrip & Heli Landing Zone	All Hazards & Flooding	2
12	Hamilton Ball Field	Helicopter Landing Zone (official)	All Hazards & Flooding	3
13	Baker River Bible Church Parking Lot	Helicopter Landing Zone (official)	All Hazards	1
14	Nichols Hill (Sheller)	Helicopter Landing Zone (official)	All Hazards for inaccessibility	2
15	Legion's Speedway	Helicopter Landing Zone (unofficial)	All Hazards	1
16	Wentworth Elementary School	Helicopter Landing Zone (unofficial)	All Hazards & Flooding	2

EMERGENCY REPOSE FACILITIES (ERF)				
BRIDGES ON EVACUATION ROUTES				
Map ID#	Facility	Type of Facility	Hazard Risk	
17	Mountain Brook Bridge (East Side Road)	Bridge on Evacuation Route	All Hazards & Flooding	2
18	Town Line Bridge (Warren)	Bridge on Evacuation Route	All Hazards	1
19	Village Bridge over Baker River on Route 25	Bridge on Evacuation Route	All Hazards	1
20	Saunders Hill Bridge	Bridge on Evacuation Route	All Hazards & Flooding	2
21	Gove Falls Bridge	Bridge on Evacuation Route	All Hazards & Flooding	2
22	Route 25 by Turner Road	Bridge on Evacuation Route	All Hazards	1
23	Dufour Bridge	Bridge on Evacuation Route	All Hazards & Flooding	2
24	South Branch (Route 25)	Bridge on Evacuation Route	All Hazards	1
25	Thayer Bridge	Bridge on Evacuation Route	All Hazards	1
26	Rowen Town Bridge on South Branch	Bridge on Evacuation Route	All Hazards & Flooding	2
27	Evans Bridge	Bridge on Evacuation Route	All Hazards	1
28	Matava Bridge	Bridge on Evacuation Route	All Hazards	1
29	Smith Bridge (by Welch's)	Bridge on Evacuation Route	All Hazards & Flooding	3
30	Stevens Bridge (Buffalo Road)	Bridge on Evacuation Route	All Hazards	1
31	Nichols Hill Bridge	Bridge on Evacuation Route	All Hazards	1
32	Frescoln Bridge (culvert)	Bridge on Evacuation Route	All Hazards & Flooding	3
33	Culvert Route 25 and Beech Hill	Bridge on Evacuation Route	All Hazards & Flooding	2
34	Culvert (Buffalo and Turner)	Bridge on Evacuation Route	All Hazards & Flooding	2
EVACUATION ROUTES				
Evacuation Routes		Type of Facility	Hazard Risk	
Route 25/Mt. Moosilauke Highway		Primary Evacuation Route	All Hazards & Flooding	2
Route 25A		Primary Evacuation Route	All Hazards & Flooding	3
East Side Road		Secondary Evacuation Route	All Hazards & Flooding	2
Buffalo Road		Secondary Evacuation Route	All Hazards & Flooding	2
N. Wentworth Road		Secondary Evacuation Route	All Hazards & Flooding	2

TABLE 4.2 – NON- EMERGENCY RESPONSE FACILITIES (NERF)

NON-EMERGENCY RESPONSE FACILITIES (NERF)				
NERF'S are facilities, that although they are critical, they 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.				
Map ID#	Facility	Type of Facility	Hazard Risk	
4	Wentworth Elementary School	Secondary EOC	All Hazards	1
35	Baker River Bible Church	Secondary Shelter	All Hazards	1
36	Wentworth Transfer Station	Waste Removal	All Hazards & Flooding	1
NM	Fairpoint Switching Station (Warren)	Utilities	All Hazards	1
NM	Fairpoint Switching Station (Rumney)	Utilities	All Hazards	1

TABLE 4.3 – FACILITIES & POPULATIONS TO PROTECT (FPP)

FACILITIES & PEOPLE TO PROTECT (FPP)				
FPPs are facilities that need to be protected because of their importance to the Town and to residents who may need help during a hazardous event.				
Map ID#	Facility	Type of Facility	Hazard Risk	
4	Wentworth Elementary	School	All Hazards	1
35	Baker River Bible Church	Historical Building	All Hazards	1
37	Camp Pemigewasset (summer)	Summer Camp	All Hazards	1
38	Old Town Hall (1899)	Historical Building	All Hazards	1
39	Wentworth Meeting House (Congregational Meeting Place)	Historical Building	All Hazards	1
40	Wentworth Historical Society & Museum	Historical Building	All Hazards & Flooding	2
41	Atwell Hill Baptist Church	Historical Building	All Hazards	1

TABLE 4.4 – POTENTIAL RESOURCES (PR)

POTENTIAL RESOURCES (PR)				
PRs are potential resources that could be helpful for emergency response in the case of a hazardous event.				
Map ID#	Facility	Type of Facility	Hazard Risk	
42	King's Mill	Building Materials	All Hazards & Flooding	2
43	Precision Lumber	Building Materials	All Hazards & Flooding	2
44	Shawnee's General Store (generator)	Gas, Diesel & Food	All Hazards	1
NM	Burning Bush Hardware (Warren)	Home Supplies	All Hazards	1
NM	Tedeschi's Store (Warren)	Gas, Diesel & Food	All Hazards	1
NM	Bixby's Sand & Gravel (Warren)	Sand, Gravel & Equipment	All Hazards	1
For all other Potential Resources, please refer to the Wentworth Emergency Operations Plan				

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Chapter 5: Hazards Effects in Wentworth

A. Identifying Vulnerable Structures

Because damages from floods and wildfire/structure fires are more predictable than damages from other disasters, it is important to identify the critical facilities 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 zone 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). A total of seventeen CIKRs were found in the flood zone as seen in the chart to the right. Twelve of the CIKR found in the flood zone are expected to be at or near water (hydrants and bridges). Two CIKR are helicopter landing zones and the final three (Historical Society, King Forest Industries and Shawnee’s Store) could be compromised in a severe flooding event. Thirty-six non-CIKR structures were also identified and assumed to be private residences.

ID	ALL_HAZARD	Hazmit_Type	NAME
8	ERF	Dry Hydrant	Dry Hydrant-John King's Gravel Pit
9	ERF	Live Hydrant	King Forest Industries-Hydrant
11	ERFH	Airport & Heli LZ	Peterson Airport
12	ERFH	Heli LZ	Hamilton Ball Field-LZ
19	ERFB	Bridge	Bridge-Village Bridge (Rt 25) over Baker
20	ERFB	Bridge	Bridge-Saunders Hill Bridge
22	ERFB	Evac Bridge	Route 25/Turner Rd
23	ERFB	Bridge	Bridge-DuFour Bridge
26	ERFB	Bridge	Bridge-Rowen Town Bridge on So Branch
27	ERFB	Bridge	Bridge-Evans Bridge
28	ERFB	Bridge	Bridge-Matava Bridge
29	ERFB	Bridge	Bridge-Smith Bridge
31	ERFB	Bridge	Bridge-Nichols Hill Bridge
32	ERFC	Bridge	Bridge-Frescoln Bridge
40	FPP	Historical Structure to Protect	Historical Society, 15 East Side Rd
42	PR	Building Materials	King Forest Industries
44	PR	Retail Store	Shawnee's Gen. Store; 73 Mt. Moosilaukee

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 action items and prioritizing those action items; it is important to determine which Critical Infrastructure and Key Resources are most vulnerable to wildfire/structure fires and to estimate their potential loss.

ID	ALL_HAZARD	Hazmit_Type	NAME
4	ERF	Primary Shelter	Wentworth Elementary School
8	ERF	Dry Hydrant	Dry Hydrant-John King's Gravel Pit
11	ERFH	Airport & Heli LZ	Peterson Airport
13	ERFH	Heli LZ	Baker River LZ
16	ERFH	Heli LZ	Wentworth Elementary School Field
35	NERF	Religious Facility	Baker River Church/Shelter

Although seventy-four structures were found in the WUI, only six CIKR were found (chart to left). These include the Wentworth Elementary School, the Baker River Bible Church, one dry hydrant and three helicopter landing zones; the Wentworth Elementary School and the Baker

River Bible Church have ample defensible space to protect them from wildfires. The additional sixty-eight structures that were identified in the WUI are assumed to be private residences.

Table 3.1, The Hazard Threat Analysis, is used to evaluate the likelihood and potential impact of all other hazards besides flooding and wildfire.

B. Calculating the Potential Loss

It is difficult to ascertain the amount of damage that could be caused by a natural or human-caused 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 Wentworth’s structures, depending on the nature of the hazard and whether or not the hazard is localized.

Assessed Value of All Structures (only)			
	2013	1% damage	5% damage
Residential	\$52,354,500	\$523,545	\$2,617,725
Manufactured Housing	\$2,422,500	\$24,225	\$121,125
Commercial	\$5,444,200	\$54,442	\$272,210
Other	\$0	\$0	\$0
Tax Exempt	\$3,108,100	\$31,081	\$155,405
Utilities	\$5,482,700	\$54,827	\$274,135
Total	\$68,812,000	\$688,120	\$3,440,600
<small>**Town of Wentworth, Annual Report 2013</small>			

Based on this assumption, the potential loss from any of the identified hazards would range from **\$0 to \$688,120** or **\$688,120 to \$3,440,600** based on the 2013 Wentworth town valuations which lists the assessed value of all structures in Wentworth to be **\$68,812,000** 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.

C. Natural Hazards

Descriptions below represent the “**local impact**” to the Community for the hazards that were identified by the Team. For the “**extent**” of these hazards, please refer to *Appendix C, The Extent of Hazards*, which includes charts such as the Saffir-Simpson Hurricane Wind Scale, the Beaufort Wind Scale, the National Weather Service Heat Index, the Sperry-Piltz Ice Accumulation Index and the Fujita Scale for tornadoes.

(1) Flooding (local, riverine & 100-year events)\$1,575,319

FLOODING LOCAL (ROADS)

Heavy rain, rapid snowmelt and stream flooding often cause culverts to be overwhelmed and roads to wash out. Today, with changes in land use, aging roads, designs that are no longer effective and undersized culverts, the risk of flooding is a serious concern. Inadequate and aging storm water drainage systems create local flooding on many of Wentworth’s roads.



It is estimated that the Town experiences some sort of storm water problem whenever there are two or more inches of rain in a short period of time. Many of the roads in Wentworth are long and winding and subject to some of the most severe weather in the State. There are 45 miles of local roads in Wentworth, 36 of which are gravel; often these roads have aging or undersized culverts and poor engineering designs. The continuous erosion of roads makes for a daunting task of “up-keep” by the Town’s highway department. Fortunately, two of the Town’s major thoroughfares, NH Routes 25 and 25A, are the responsibility of the State.

Mitigation Action Item #31 calls for the development of a storm water maintenance program that will address both ditching and the condition of culverts in Town in order to mitigate flooding issues. In addition, Action Item #19 calls for the upgrade of two culverts on Rowentown Road. Other culverts will need replacement and/or improvements in the future.

The cost of road erosion is difficult to calculate and it cannot be based on the assessed value of structures in Wentworth. The expected loss value would be primarily on the economic impact on Community, the loss of accessibility and the time and cost of road repair which could be in the millions; however, based on the assumption that damage would not occur to structures, the structure loss value due to road flooding was not estimated.

RIVERINE & 100-YEAR FLOODING EVENTS

Flooding is often associated with tropical storms, heavy rains and rapid snowmelt in the spring. Based on the Grafton County Floodplain Map, Wentworth has a relatively small 100-year floodplain which follows along the banks of the Baker River, the South Branch Baker River and Pond Brook. Through GIS analysis, 39 structures were found to be in the flood zone including three CIKR but not including bridges, dams and helicopter landing zones.

Structures in the Floodplain	
Total Housing Units*	477
Total Assessed 2013**	\$68,812,000
Average Value	\$144,260
Number in 100-Year Floodplain***	39
Estimated Assessed Value	\$5,626,138
Medium Risk at 28%	0.28
Potential Loss Value	\$1,575,319
<i>*American Community Survey (2008-20012)</i>	
<i>**Town of Wentworth, Annual Report 2013</i>	
<i>***GIS Analysis by MAPS</i>	

Nearly every spring the banks of the Baker and South Branch Rivers overflow, at times causing the closure of some of the Town’s roads. Ice jams, particularly on the South Branch Baker River, have created flooding of Rowentown Road for as long as week, leaving livestock stranded and in need of rescue.

Tropical Storm Irene, the remnants of Hurricane Irene, brought heavy rain and local flooding to Wentworth. More information on the impact of Tropical Storm Irene is detailed later in this chapter.

The table above shows the methodology used to determine the risk assessment for structures in the floodplain. By averaging the cost of all structures and multiplying it times the number found in the floodplain, the estimated assessed value for these structures becomes \$5,626,138. Then, assuming a medium risk of 28%, the final potential loss value for structures in Wentworth’s floodplain is \$1,575,319.

(2) High Winds (Windstorm)..... \$0 to \$688,120

Due to the geographic location of Wentworth and its location in the White Mountains of New Hampshire, isolated high winds and down drafts are common occurrences within the Town. Wind tends swoop down the mountain sides creating “wind tunnels” in parts of the Town. High winds have brought down trees and power lines and have caused power failures and road closures. Gusts of over 30 mph are not uncommon in the Town of Wentworth.

High wind events are unpredictable; winds of this magnitude could fall timber, which in turn could block roadways, down power lines and impair emergency response. Old-growth softwood is affected by these unexpected windstorms, particularly in the spring when the water table is high.

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) Severe Winter Weather (including Ice Storms) \$688,120 to \$3,440,600

SNOW STORMS

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 Wentworth in the past. All of these impacts are a risk to the Community, including isolation, particularly of the elderly and increased traffic accidents. Damage caused by severe winter snowstorms varies according to wind velocity, snow accumulation, duration and moisture content. Seasonal accumulation can also be as significant as an individual snowstorm. Heavy overall winter accumulations can impact the roof-load of some buildings.

Wentworth’s roads are often impacted by poor weather conditions and this combined with the steep terrain can make travel difficult. The topography of Wentworth, with large mountains and deep river valleys makes winter weather conditions that much more threatening. Severe winter snow storms or blizzards can shut all of Wentworth’s roads down at least temporarily and thus prevent many of the Town’s citizens from going to work and prevent visitors from arriving. Fortunately, in New England, most road crews are able to handle 2-3’ snow storms with a little time on their side.

ICE STORMS

Of more concern in Wentworth than 2-4’ snow storms are ice storms, though the probability of the occurrence of a major ice storm is lower than that of a major snowstorm. A significant ice storm can inflict several million dollars’ worth of damage to forests and structures. The 1998 Ice Storm inflicted some damage to the higher elevations of Wentworth causing ice on trees, downed power lines, closed roads, limited EMS access and power outages. Fortunately, the damage was not as severe as in other parts of New Hampshire. The 2008 Ice Storm did not impact Wentworth.

Due to the widespread nature of ice storms and the excessive damage this type of storm is able to produce, the potential loss value is estimated to be between 1% and 5% of the total assessed value of all structures in town.

(4) Severe Thunderstorms & Lightning \$0 to \$688,120

Severe lightning as a result of summer and mountain storms or as a residual effect from hurricanes and tornadoes has occurred in Wentworth. Some of the Town’s structures are older buildings and many structures 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 or injure or kill an individual, but the direct damage would not be widespread.

The Team noted that it appears that severe thunder and lightning storms are happening more often than in the past; several lightning strikes are documented each year. Lightning is a potential problem, but one who’s affects would be localized. Based on the localized nature of lightning strikes, the potential loss value was determined to be 0-1% of the total assessed structure value in Town.

(5) Hurricane & Tropical Storm..... \$0 to \$688,120

Wind damage due to hurricane is a consideration because of the forest and valley floors in Wentworth. 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 New Hampshire, but they should not be ruled out as potential hazards. In most cases, Hurricanes have been down-graded to Tropical Storms by the time they reach northern New Hampshire.



Tropical Storm Irene, the remnants of Hurricane Irene, brought heavy rain and local flooding to Wentworth. Several trees were downed as were some power lines. For most in Town, there was a brief loss of power; however some residents experienced power outages for three to four days. The heavy rains caused the Baker River and the South Branch of the Baker River to overflow their banks along Wentworth's floodplain.

Road closures and washouts, power outages and erosion issues on the Baker River were all caused by the torrential rains of Irene. In addition to there was damage on Rowentown Road and other roads in the Community; part of Frescoln Road was washed out. Even the Town's tennis courts and the athletic fields (Hamilton Field) were damaged; when the water receded, a layer of silt was left behind causing considerable damage. A 10" culvert at one campground was washed away causing campers to be temporarily stranded, some basements were flooded causing property damage and one resident had to be carried out of her home.

For the most part, the Town's bridges held up during Irene, however, one bridge abutment was damaged and required repair. The Town's dams also held up during Irene; although they were threatened by high water, there were no breaches. Washed-out roads and culverts did not hold up as well; the Town spent six weeks fixing and/or replacing culverts and received \$60,000 from FEMA (of a total of \$80,000) in reimbursements for the damage that was done.

Hurricane Sandy also impacted Wentworth but severe flooding was not an issue as it had been during Irene. The high winds of Sandy caused a dozen or more trees to fall causing power outages, keeping many residents of the Community in the dark for 3-5 days.

Although Tropical Storms Irene and Sandy had an impact in Wentworth, the probability that hurricanes remaining a Category 1 or better in this part of the State is low. Therefore, the potential loss value due to hurricanes was determined to be between 0% and 1% of the total assessed structure value.

(6) Extreme Temperatures (hot & cold) Structure loss value was not estimated

EXTREME COLD & EXTREME HEAT



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 able to cope with extreme cold.

Also of concern today are extreme heat conditions. Few residents, particularly the elderly and vulnerable populations, have air conditioners and are less able to cope with extreme heat.

Extreme temperatures when combined with power failure are of the most concern; power failure would 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.



The cost of extreme temperatures is difficult to calculate as it is not based on the loss of structures. The expected loss value would be primarily on the economic impact on Community and the time and cost of emergency response; based on the assumption that damage would not occur to structures, the structure loss value due to extreme temperatures was not estimated.

(7) Wildfire.....\$2,827,495

Due to the abundance of slash on the forest floor left by logging operations, blow downs and storms, there is potential for fast burning fuels. Burn permits are required in Wentworth, as they are throughout the state, but often burning takes place without the proper permits. The steep terrain and heavily forested areas of town are difficult to monitor, therefore the occasional unauthorized burn will take place. Currently available documentation on fires in Wentworth indicates that the majority of fires are human-caused. The Team noted that although many fires were listed in the previous hazard mitigation plan, many of those were of insignificant size (see Table 3.2) and that no significant wildfires have occurred in Wentworth since the completion of the last plan.

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 the WUI are generally assumed to be at some level of risk and therefore, vulnerable to wildfire (see Map 2). It should be noted that in communities that are heavily forested, like Wentworth, many Rangers feel that the entire community is in the WUI and therefore the extent of a wildfire could potentially be the entire community.

Structures in the Wildland Urban Interface (WUI)	
Total Housing Units*	477
Total Assessed 2013**	\$68,812,000
Average Value	\$144,260
Number in WUI***	70
Estimated Assessed Value	\$10,098,197
Medium Risk at 28%	0.28
Potential Loss Value	\$2,827,495
<i>*American Community Survey (2008-20012)</i>	
<i>**Town of Wentworth, Annual Report 2013</i>	
<i>***GIS Analysis by MAPS</i>	

Seventy structures, including two CIKR but not hydrants and helicopter landing zones, 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 \$10,098,197. Then, assuming a 28% (medium) risk for wildfire, the total potential loss value was estimated to be \$2,827,495 (refer to chart above).

- (8) Downburst (microburst or macroburst)..... \$0 to \$688,120**
- (13) Tornado \$0 to \$688,120**

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 or less, whereas a macroburst is a similar wind event that is greater than 2.5 miles wide and generally lasts longer than a microburst.

A tornado touched down in Carroll County in July 2008, but it did not reach Grafton County or Wentworth. In the past, Wentworth has experienced minor downbursts that resulted in isolated property damage. The high elevations in Wentworth, including Carr Mountain at 3,453', deter the occurrence of tornadoes, but can contribute to the formation of downbursts.

However, due to the rareness of these events in New Hampshire, the likelihood of a tornado or downburst is low and the affects would be localized. Therefore, the potential loss value was determined to be between 0% and 1% for both downbursts and tornadoes.

- (9) Earthquake \$0 to \$688,120**

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines and are often associated with landslides and flash floods. Four earthquakes occurred in New Hampshire between 1924-1989 having a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia and one near the Quebec border. It is well documented that there are fault lines running throughout New Hampshire, but high magnitude earthquakes have not been frequent in New Hampshire history.



In October 2012, an earthquake with its epicenter in Hollis, ME and a magnitude of 4.6 on the Richter Scale occurred. The tremor was felt through most of New England and in Wentworth, but no damage was reported.

Although historically earthquakes have been rare in New Hampshire, the potential does exist and depending on the location, the impact could be significant. The potential structure loss value due to earthquakes was determined to be between 0% and 1% of the total assessed structure value.

- (10) Mudslide, Landslide, Erosion (Erosion)..... Structure loss value was not estimated**

Erosion, landslides and mudslides are often associated with heavy rains, steep terrain and the overflow of river banks. Any one of these hazards, or a combination of them, could result in damage in New Hampshire communities.

Although mudslides and landslides are not of concern in Wentworth, erosion, particularly along the banks of the Baker River has been and continues to be worrisome. High water events, as was seen during Tropical Storm Irene, produce erosion and the subsequent loss of land along the riverbank. Changes in the course of the river and the undermining of nearby roads and bridges are also effects of riverbank erosion. During Tropical Storm Irene the

Town lost some land at Riverside Park to the river; fortunately the Town’s bridges and dams did not experience significant damage due to erosion.

River erosion is ongoing and although possible, no structure damage has resulted from river erosion in the past; therefore, no structure loss value was estimated.

(11) Hailstorm \$0 to \$688,120

Hailstorm events, although not common in Wentworth, can occur at any time. In recent years, other communities in northern New Hampshire have experienced hailstones as part of severe thunder and lightning storms, but fortunately, Wentworth has not experienced any damage.

Damage from hail could result in failed crops and structure and vehicular damage, thus creating an economic impact for individual citizens. Overall it was felt that a significant hailstorm event would be unlikely and would cause minimal damage; therefore the potential loss value is estimated at 0% and 1% of the assessed value.

(12) Drought..... Structure loss value was not estimated

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. Fortunately, significant droughts rarely occur in New Hampshire or Wentworth. According to the NH Department of Environmental Services, five significant droughts have occurred since 1929.⁸

The cost of drought in Wentworth is difficult to calculate as any cost would primarily result from an associated fire risk, diminished water supply and economic hardship. Based on the unlikelihood of a serious drought occurring in New Hampshire and because the hardship would be primarily economic, the structure loss value was not estimated.

D. Human-caused Hazards

The following human-caused hazards were also considered while developing this hazard mitigation plan. Though these hazards are not analyzed in more detail as part of this Plan, they are none-the-less worth mentioning as real and possible hazards that could occur in Wentworth.

1) Extended Power Failure

Extended power failure is a concern, particularly when combined with any of the natural hazards detailed above. Extended power outages of several days have occurred in Wentworth, 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 or handicapped. Tropical Storms Irene and Sandy caused power failures for 3-4 days.

The Team felt that many residents were somewhat self-sufficient; many residences are equipped with generators and many others have woodstoves. The biggest impact from on expended power failure would be the

⁸ NH DES; <http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf>

inconvenience caused by the inability to pump water for residents who rely on wells. It is also noted that Wentworth is a somewhat difficult place for senior citizens to live; not only is the driving difficult due to weather conditions and steep terrain, but virtually all services including pharmacies and major grocers are located out of town.

2) Hazardous Material Transport

The possibility of vehicular accidents involving hazardous materials is identified as potentially significant in Wentworth. The Town has one major road, NH Route 25, a major east-west corridor through New Hampshire. This road is well-travelled and is a major traffic route from Plymouth in the east to Haverhill in the west. Trucks using NH Route 25 carry hazardous materials such as a variety of chemicals and petroleum products through the Community. Other well-travelled routes include North Dorchester Road and US Route 25A.

3) Dam Failure

Four earthen dams are located in Wentworth and one cement dam on Pond Brook by the intersection of Cape Moonshine and Route 25A. The most populated area of the Town is located downstream from two of these dams, one on Beech Hill Road and one on the northerly end of Buffalo Road. No major breaches of any of the Town's dams have occurred in the past and it was determined that the risk of dam failure and resulting damaged has a low probability. Two flood-control dams outside of Town, the Hilldredth Dam in Warren and the South Branch Dam in Dorchester, could be potentially cut Wentworth off from emergency response and other out-of-town services.

4) Epidemic/Pandemic

Wentworth's unique geography provides hikers and summer and winter recreation enthusiasts many opportunities to visit the Town; this small Community's population shows a modest increase during both summer and winter months. In addition, Wentworth's middle and high school children attend school in the neighboring town of Plymouth. Because of these factors, the Team determined that an epidemic or pandemic could present a possible threat to Wentworth. With the occurrence of world-wide pandemics such as SARS, H1N1 and Avian Flu, Wentworth could be susceptible to an epidemic and subsequent quarantine.

5) Hazardous Material Fixed

Hazardous material in a fixed location is of some concern, particularly due to the natural gas pipeline which travels through parts of Wentworth. Although safety precautions are in place, a natural gas leak could occur and not be noticed as natural gas is odor free. It was reported that in the early 2000s just over the border in Canada, a natural gas leak in the pipeline blew the windows out of a farmhouse about a mile away. The blast from this explosion caused buildings in Wentworth Village (9-10 miles away) to shake.

6) Terrorism

Terrorism is a concern in Wentworth and in our nation in general, although there are no known targets in Wentworth. As with many small towns, the terrorism threat is minimal; if a terrorist incident were to occur, it would most likely be a home-grown terrorist event.

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Chapter 6: Current Policies, Plans & Mutual Aid

After researching historic hazards, identifying CIKR and determining potential hazards, the Team determined what is already being done in Town to protect its citizens and structures.

Once identified, the Team addressed each current policy or plan 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 mitigation action items for this Plan.



With the knowledge of what regulations Wentworth currently had in place, creating new action items was less difficult. This process was helpful in identifying current plans and policies that were working well and those that should be addressed as a new “action item” as well as the responsible departments. The table that follows, Table 6.1, Policies, Plans & Mutual Aid, shows the analysis that resulted from discussion with the Team.

TABLE 6.1: CURRENT POLICIES, PLANS & MUTUAL AID

KEY TO EFFECTIVENESS:

- Excellent**..... The existing program works as intended and is exceeding its goals.
- Good** The existing program works as intended and meets its goals.
- Average** The existing program does not work as intended and/or does not meet its goals.
- Poor** The existing program does not work as intended, often falls short of its goals, and/or may present unintended consequences.

Current Program or Activity	Description	Area of Town Covered	Enforcing Department	Effectiveness	Improvements or Changes Needed
Federal Building Codes	Federal and state regulations to ensure buildings meet energy efficiency codes	Town-wide	Federal and state building inspectors	Good	No Improvements Needed: The Fire Department inspects multi-family or public rental properties, commercial properties and public assembly buildings for safety and fire codes; when needed, the Fire Department will call on the State Fire Marshall for assistance when needed.
Road Design Standards	Standards and specifications for construction of roads: town will not assume ownership of substandard roads	Town-wide	NH Department of Transportation	Good	No Improvements Needed: Road standards are part of the Town's Subdivision Regulations; road standards are based on the State of NH road standards and new roads will not receive approval if the standards are not met. The Town will not assume ownership (vote at Town Meeting) of substandard roads that are not built to standards.

Current Program or Activity	Description	Area of Town Covered	Enforcing Department	Effectiveness	Improvements or Changes Needed
White Mountain National Forest 15-20 Year Plan	The White Mountain National Forest Land Management Plan is a 15-20 year Plan that identifies the land use within the Forest	Areas of town included in White Mountain National Forest	Select Board	Good	Improvements Needed: 1/4 of the Town is controlled by the National Forest; the WMNF has done major cuts in parts of town and they remove culverts when complete, thus disabling access to fire roads; the Town should participate in discussions about the method of departure from logging sites. Action Item #22
State Division of Forest and Lands/Fire Permits	State regulations for open burning	Town-wide	Fire Wardens	Good	No Improvements Needed: System that is in place with NH Forests & Lands and the local fire wardens work well; public is aware of fire permitting requirements.
Burning Index	New Hampshire Forests & Lands (DRED) has a burning index, which measures the risk for wildfires; how likely they are to start on a given day. It also evaluates the potential damages wildfires can create, the number of people that will be needed to fight it and the type of equipment that might be needed as well.	Town-wide	DRED	Good	No Improvements Needed: Program works well; administered by NH Forests & Lands (DRED).
Town: Master Plan (1986)	Includes goals, objectives and expectations for future development of the Town	Town-wide	Planning Board	Poor	Improvements Needed: The Wentworth Master Plan is scheduled to be created; the Planning Board will review this HMP at the same time and to consider incorporating some of the strategies into the new Master Plan. Action Item #17
Town: Emergency Operation Plan (2000)	This plan offers all members of the emergency management team a better understanding of procedures in case of a disaster	Town-wide	EMD	Average	Improvements Needed: The Wentworth EOP should be updated as soon as possible. Action Item #9
Capital Reserve Fund	A phased projection of major equipment and supply purchase/replacement	Town-wide	Select Board	Good	Improvements Needed: The purpose of the Capital Reserve Fund should be reviewed; some CRFs may be too specific, review whether to change or create/update new CRFs for alternative projects. Reevaluate needs and funding allocations. Action Item #23

Current Program or Activity	Description	Area of Town Covered	Enforcing Department	Effectiveness	Improvements or Changes Needed
School Emergency Response Plan	Insures preparedness and response for school personnel and town emergency personnel in the instance of a major disaster in the school	School	School Board	Good	Improvements Needed: The current School Emergency Response Plan is under review; deferred to this Plan to complete and keep updated. Action Item #24
Subdivision Regulations (2007)	Includes fire and emergency access, drainage, floodplain and bonding provisions	Town-wide	Planning Board	Good	No Improvements Needed: Land Subdivision Regulations are reviewed as appropriate; the regulations work well and are reviewed and/or adjusted as the need arises. See Table 7.1 for subdivision regulations in reference to fire suppression.
Town: Fire, Police and Ambulance Mutual Aid Agreements	Offers access to resources appropriate to the scope of the emergency	Town-wide	Fire Chief, Police Chief, Select Board	Good	No Improvements Needed: Lakes Region fire Mutual Aid provides immediate response from multiple departments; this mutual aid program works well and is very reliable.
Town: Warning Systems	Telephones	Town-wide	EMD	Good	Improvements Needed: CodeRED is an excellent warning system but it only stores resident phone numbers that are listed in the phone book; Town should provide public outreach to encourage residents to contact CodeRED to add cell numbers, unlisted numbers and emails and to verify information. Action Item #21
Radios/Pagers	Used for emergency communications	Town-wide	Fire and Police Chief	Good	No Improvements Needed: All emergency departments have interoperable communications capabilities and continue to use pagers as well.
Building Permits	The town complies with the National Residential Building Code and International Commercial Building Code which incorporates the IPC and NFPA. Currently there is a part-time code enforcement officer to enforce the standards.	Town Wide	Code Enforcement Officer	Good	No Improvements Needed: Compliance is met through adherence to state and national building codes; building permits are not required except for building in the floodplain; system has worked well for the Town.

Current Program or Activity	Description	Area of Town Covered	Enforcing Department	Effectiveness	Improvements or Changes Needed
State Health Department Public Health Plan	State plan, "Influenza, Pandemic, Public Health Preparedness and Response Plan" written by state health department to be prepared for any public health emergency; the Town is part of Central NH Public Health Region	Town Wide	Central NH Public Health Region	Good	No Improvements Needed: Public Health Plan does what it is meant to do; the Town participates in regional public health meetings whenever possible.
E-911	Markers at driveway entrances that identify residence locations in conjunction with the E-911 alerting system.	Town Wide	Fire Department	Good	Improvements Needed: Currently there is not an ordinance in place for the placement for E-911 signage, the Town as relied on public education; approximately 50% are not compliant; additional public education is needed; Police Department has some signs from the initial purchase; the Town should issue a flier, make announcements at Select Board meetings and/or solicit the help of special groups such as the Boy Scouts to get additional signage complete. Action Item #25
Emergency Generators	Facilities that currently have emergency generators are (portable at FS)	Town Wide	EMD	Fair	Improvements Needed: Generators are needed at the Town Hall, the Wentworth Elementary School & potential new Fire Station. Action Item #13, 14 & 16
NIMS & ICS Training	Ensure effective command, control and communications during emergencies.	Town Wide	EMD/Fire Chief	Fair	Improvements Needed: Not all of Wentworth's town officials have received NIMS & ICS training, although firefighters have; EMD should encourage all town officials to take NIMS 700 and ICS 100 and 200. Action Item #10

Chapter 7: Prior Mitigation Plan(s)

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

Wentworth has participated in the development of a prior Hazard Mitigation Plan, based on the Disaster Mitigation Act (DMA) of 2000, which received Final Approval by FEMA on March 11, 2009. This Plan, the “Wentworth Hazard Mitigation Plan Update 2014” is an update to the 2009 Plan.

Below are the action items that were identified in the 2009 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

NOTE: Items in **red** were extracted word-for-word from the 2009 Hazard Mitigation Plan and do not represent a timeframe for this plan.

Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(31) Obtain one town-wide frequency for all departments.	Select Board	Local	5/31/2008	Partially Completed & Deferred: The Town of Wentworth is in the process of finalizing the license; frequencies are in place; Town has interoperability; deferred to finalize the licensing. Action Item #1
(5) Establish a dry hydrant/fire pond construction and maintenance program that will include records kept of semi-annual or annual flow test on each hydrant and cleaning or maintenance dredging of fire ponds.	Fire Commissioners	Local	10/30/2008	Completed: The Fire Department keeps records of flow tests and maintains the hydrants as needed; dredging of fire ponds is left up to the landowner.
(14) Ensure the US Forest Service approves this wildfire plan as a Community Wildfire Protection Program.	North Country Council	N/A	9/30/2008	Deferred: Although the 2009 Hazard Mitigation Plan addressed wildfire fire issues and was planned to be a Community Wildfire Protection Plan, the Plan was never officially approved by DRED; this All Hazard Mitigation Plan will be approved as a CWPP. Action Item #2

Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(21) Conduct/run drills to ensure readiness for response to school emergencies.	School Board	Local	6/30/2008	Completed & Deferred: Since the development of the last Hazard Mitigation Plan, drills have been done in coordination with the School, Fire and Police Departments. These drills will continue on an annual basis. Action Item #3
(11) Implement program to provide training to fire personnel on wildland fire suppression, dry hydrant design, and site evaluations of water resources.	Fire Commissioners	Local	7/30/2008	Completed & Deferred: The Town's fire department participates in annual fire training sponsored by the Lakes Region Fire Mutual Aid Association and by the NH Fire Academy; this training continues on a regular basis and is part of emergency preparedness for the Town. Action Item #7
(25) Maintain and update mutual aid contracts as needed with Wentworth/EMS shared resources.	Select Board	Local	9/30/2008	Completed: Mutual aid agreements have been made and continue to be updated with the Lakes Region Fire Mutual Aid Association for the Wentworth Fire Department; the Police Department maintains written agreements with Rumney, Plymouth, Groton, Hebron, Orford, Piermont & Warren; ambulance service for the Town is provided by the Warren/Wentworth Ambulance Service.
(26) Integrate needs of all municipal departments in capital reserve fund process.	Select Board/Trustees of Trust Funds	Local	5/30/2008	Completed: Wentworth does not have a Capital Improvement Plan but does have Capital Reserve Funds that are set aside each year for equipment and other purchases for each department.
(18) Train emergency personnel on ICS, HAZMAT, NIMS and other appropriate training.	Fire Commissioners/Fire Department	Local	8/30/2008	Deferred: Training on HAZMAT continues as part of training provided by Lakes Region Fire Mutual Aid and the Fire Academy. Action Item #5

Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(15) Ensure people living in WUI areas outside of Class V roads are notified of FEMA pre-mitigation standards.	Select Board	Local	6/30/2008	Deleted: The Team decided that those people living on these roads are made aware of limited services and the possibility that they may not receive post-disaster FEMA funding.
(1) Gather information relevant for hydrant construction (seasonal water level, area available for apparatus, static lift) at South Wentworth Drive: Site WE 020.	Fire Commissioners	Local	10/30/2008	Deferred: Dry hydrant construction at North Wentworth Road (South Wentworth Drive) was not completed due to limited personnel, time, money and permitting issues; deferred to this plan. Action Item #6
(9) Encourage referral to Water Resource Plan and maps by Planning Board when reviewing subdivision proposals.	Planning Board	Local	6/30/2008	Deferred: This was not done due to oversight; this is deferred to this Plan; Town will get a copy of the WRP from NCRC&D. Action Item #7
(36) Tree growth may cause damage to emergency vehicles and may hinder movement of the vehicles.	Select Board	Local	10/31/2008	Completed & Deferred: The canopy of trees in some areas of Town has been reduced but more canopy reduction needs to take place. Action Item #8
39) Obtain free NFIP materials and have these materials (pamphlets, brochures, etc.) available at the Town Offices for all citizens of the community; to increase all citizens' knowledge of NFIP whether or not their properties are in the floodplain.	Select Board/Planning Board/EMD	Local	6/30/2009	Completed: The Town has received a supply of NFIP brochures from the NH Office of Energy and Planning; these brochures are provided to the public, those residents who are contemplating substantial improvements and to developers who are considering construction in the floodplain.
(22) Update EOP.	EMD	Local/Grants	12/31/2009	Deferred: The Wentworth EOP needs a recommended update as soon as possible. Action Item #9
(32) Develop annexes in EOP for all dam sites.	EMD	Local/Grants	12/31/2009	Deferred: The Wentworth EOP will include annexes for all dam sites in the Town. Action Item #9

Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(19) Train town officials and staff on ICS, NIMS, and other appropriate training.	Select Board	Local	6/30/2009	Completed & Deferred: Some of Wentworth's town officials have received NIMS & ICS training, although some have not; the EMD should encourage all town officials to take NIMS 700 and ICS 100 and 200. Action Item #10
(16) Ensure developers install cisterns, dry hydrants, or fire ponds in developments (when necessary).	Planning Board	Local	9/30/2009	Completed: Cisterns, dry hydrants and fire ponds have been and are addressed in the Town's subdivision regulations.
(13) Initiate a program to construct and maintain a series of dry hydrants and/or cisterns to upgrade current draft sites and/or augment the municipal hydrant system.	Fire Commissioners/Fire Department	Local	12/31/2009	Completed: The Wentworth Fire department maintains all current hydrants and dry hydrants on a regular basis and recommends improvements or upgrades as needed; funding these improvements when needed would be presented to the Town through the Town Warrant.
(6) Amend or include money in the Capital Improvement/Reserve Plan for water drafting, site development, and fire equipment.	Select Board	Local	4/30/2009	Deleted: Wentworth's Capital Reserve Funds (CRF) are set aside each year for equipment and other purchases for each department, including a CRF for the Fire Department; there is no CRF for water drafting, site development and fire equipment as money for these items can be placed on the Town Warrant.
(2) Gather information relevant for possible hydrant construction (seasonal water level, area available for apparatus, static lift) at Lower Baker Pond Draft Site: WE 011.	Fire Commissioners/Fire Department	Local/Grants	9/30/2009	Deleted: The Team felt that a hydrant is no longer necessary at the Lower Baker Pond Draft site; there is adequate water supply at this site for fire suppression.
(30) Ensure all police/fire/EMS/highway radios/cell phones are programmed for both analog and digital frequencies.	Select Board	Local/Grants	12/31/2009	Completed: The Town of Wentworth has improved communications systems for all emergency responders; all departments are now interoperable and the system includes all of the necessary digital and analog frequencies to communicate effectively.

Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(38) Bridges that need to be replaced/updated: Silver Bridge, Evans Bridge, Dufour Bridge.	Select Board	Local/Grants	12/31/2014	Completed & Deferred: The repair work to Silver Bridge was completed in 2011 using state, federal and local funds; Evans Bridge is anticipated to be completed during the Fall of 2013 using state and local funds; Dufour Bridge is slated for repair work in the Fall 2013 using state and local funds. Action Items #11 & 12
(7) Consider establishment of a Steep Slopes Ordinance to restrict and/or prohibit development in difficult to reach areas.	Select Board/Planning Board	Local	4/1/2012	Deleted: A steep slopes ordinance has not been created due to oversight, time and political issues. The Team felt that a steep slopes ordinance would not be welcomed by the Town's residents and that it may infringe upon their rights.
(37) Pave roads and/or "stone" ditches on Atwell Hill Road and Beech Hill Road to prevent washouts.	Select Board	Local/Grants	6/30/2013	Completed: Atwell Hill Road and Beech Hill Road have been improved to help prevent future washouts through paving and ditching projects.
(27) New or expanded town facilities should include provisions for emergency power generation (town office, fire station, elementary school, town garage).	Select Board	Local/Grants	9/30/2015	Deferred: Generators have not been installed since the last hazard mitigation plan due to budget constraints; generators are still needed at the Wentworth Elementary School (Primary Shelter), the Town Office (Records & Administration) and the Fire House (if a new fire house is built, current Fire House has a small portable generator). Action Items #13, 14 & 16
(33) Ensure town response to emergencies is increased through enhancing the centralized emergency operations center.	Select Board/EMD	Local/Grants	6/30/2012	Deferred: The Wentworth EOP needs an update as soon as possible and will address the Emergency Operations Center (EOC). Action Item #9
(28) Update sites to improve reception and coverage area for emergency response personnel who use pagers as a response system.	Select Board/EMD	Local/Grants	6/30/2010	Completed: The Town of Wentworth has improved communications systems for all emergency responders and all departments are now interoperable; pagers all also used as part of this system.

Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(12) Consider establishing driveway standards that address slope, width and access. Emergency response to residential homes in remote access areas is often hampered by design of driveways.	Select Board/ Road Agent	Local	6/30/2012	Deleted: A steep slopes ordinance has not been created for driveways although there is a requirement for driveway permits to insure the necessary visibility and appropriate entrance to the main road; the Team felt that a steep slopes ordinance for driveways would not be welcome by the Town's residents.
(17) Update Master Plan to reflect changing needs of the community and to maintain public health and safety. Next update planned to be completed by 2010.	Select Board/Planning Board	Local/Grants	9/30/2010	Deferred: The Master Plan has not been created; deferred to this Plan to be done. Action Item #17
(10) Map and assess water sites and other resources along woods-roads and trails for wildland firefighting.	Select Board/Fire Commissioners/Fire Department	Local/Grants	6/30/2013	Deleted: Not done because of time and personnel requirements to get the job done; still a worthwhile project but it is unlikely that it will be done; most of the emergency responders in Wentworth are familiar with the trails and roads in town, some have been mapped by 911 and the Town tax maps; the Team felt that because of the unlikelihood of this ever being done, that the strategy should be deleted.
(8) Review of current subdivision regulations to consider onsite water storage, minimum fire flow, and fire breaks in WUI.	Planning Board	Local	4/30/2010	Deferred: Not done because of time and personnel requirements to get the job done; still a worthwhile project to be considered when subdivision regulations are reviewed again. Action Item #18
(23) Implement road standards for non-subdivision single-family residential development.	Select Board/Road Agent	Local	4/30/2010	Deleted: This strategy was deleted because the 2014 Team did not understand the strategy nor see a reason for it.
(34) Upgrade/replace existing culverts (Rowentown Road at Smith Bridge).	Select Board/Road Agent	Local/Grants	6/30/2015	Deferred: Culverts (2) on Rowentown Road at Smith Bridge have been repaired, but they are not as efficient as they should be; the Road Agent has recommended that these culverts be replaced with a bridge or a single larger culvert. Action Item #19

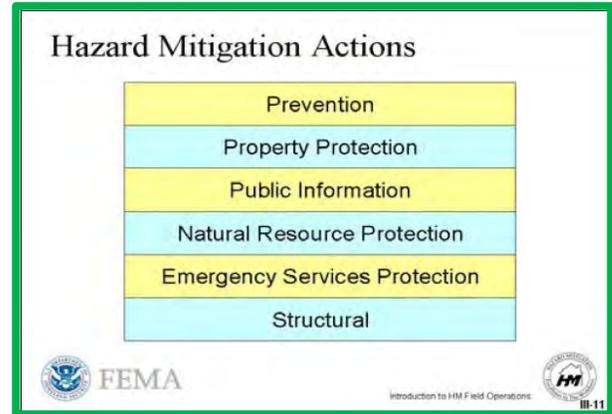
Project	Responsibility or Oversight	Funding & Support	Timeframe	Completed, Deleted, Deferred
(20) Integration of several different activities. Test town EOP.	EMD	Local/Grants	6/30/2011	Completed: The EOP has been tested, particularly during the events surrounding Hurricane Irene.
(4) Site and construct a cistern =/<30,000 gallons in area of strategic advantage (WE 001).	Fire Commissioners/Fire Department	Local/Grants	9/30/2016	Deferred: Time and money constraints have kept this from being done since the last plan, but a cistern is recommended at the Wentworth Elementary School. Action Item #20
(29) Investigate cell phone plan for town staff/emergency operations staff.	Select Board	Local/Grants	6/30/2016	Deleted: This is not applicable as a good part of the Town does not have dependable cell phone coverage.
(24) Investigate alternative warning systems that may be used in an emergency (i.e., dam breach, flood) such as reverse 911.	EMD	Local/Grants	9/30/2015	Improvements Needed: Code Red is an excellent warning system but it only stores resident phone numbers that are listed in the phone book; Town should provide public outreach about Code Red and to encourage residents to register with Grafton County Code Red to add cell numbers, email, unlisted numbers and to verify information; invite the Grafton County Sheriff's Department to come explain Code Red to the public. Action Item #21
(35) Review possible emergency roads for potential upgrade to fire lanes to provide for fire/emergency equipment response and accessibility.	Select Board	Local/Grants	9/30/2016	Deleted: The Team felt that the Class VI roads, if needed for an emergency, would be able to be opened up and become accessible.
(3) Gather information relevant for hydrant construction (seasonal water level, area available for apparatus, static lift) at Route 25A near Camp Pemi Draft Site (Boat Launch): WE 021.	Fire Commissioners/Fire Department	Local/Grants	9/30/2016	Deleted: The Team felt that this is no longer necessary; there is adequate water supply at this site for fire suppression.

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Chapter 8: New Mitigation Strategies & STAPLEE

A. Mitigation Strategies by Type

The following list of mitigation categories and comprehensive possible strategy ideas was compiled from a number of sources including the USFS, FEMA, other Planners and past 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 new ideas, better relationships and a more in depth knowledge of the Community.



Prevention

- Forest fire fuel reduction programs
- Special management regulations
- Fire Protection Codes NFPA 1
- Firewise landscaping
- Culvert and hydrant maintenance
- Planning and zoning regulations
- Building Codes
- Density controls
- Driveway standards
- Slope development regulations
- Master Plan
- Capital improvement program
- Rural Fire Water Resource Plan
- NFIP compliance

Public Education & Awareness

- Hazard information centers
- Public education and outreach programs
- Emergency website creation
- “Firewise” training
- NFIP awareness
- Public hazard notification
- Defensible space brochures

Emergency Service Protection

- Critical facilities protection
- Critical infrastructure protection
- Emergency training for town officials
- Ongoing training for first responders

Property Protection

- Current use or other conservation measures
- Transfer of development rights
- Firewise landscaping
- Water drafting facilities
- High risk notification for homeowners
- Structure elevation
- Real estate disclosures
- Flood proofing
- Building codes
- Development regulations

Natural Resource Protection

- Best management practices within the forest
- Forest and vegetation management
- Forestry and landscape management
- Wetlands development regulations
- Watershed management
- Erosion control
- Soil stabilization
- Open space preservation initiatives

Structural Projects

- Structure acquisition and demolition
- Structure acquisition and relocation
- Bridge replacement
- Dam removal
- Culvert up-size and/or realignment

B. Potential Mitigation Strategies by Hazard

In order to further promote the concept of mitigation, the Town was provided with a flier that was developed by Mapping and Planning Solutions and used to determine what additional mitigation action items might be appropriate for the Town. The mitigation action items from that flier are listed on the following two pages; each item from this comprehensive list of possible mitigation action items was considered by the Planning Team to determine if any of these action items could be put in place for Wentworth with special emphasis on new and existing buildings and infrastructure.

<u>Strategies that may apply to more than one hazard</u>	<u>Type of Project</u>
• Community Outreach and Education	Public Awareness
• Changes to Zoning Regulations	Prevention
• Changes to Subdivision Regulations	Prevention
• Steep Slopes Ordinance	Prevention
• Density Controls	Prevention
• Driveway Standards	Prevention
• Emergency Website Creation.....	Public Awareness
• Critical Infrastructure & Key Resources	Emergency Service Protection
• Emergency Training for Town Officials	Emergency Service Protection
• High Risk Notification to Homeowners	Property Protection
• Master Plan Update or Development	Prevention
• Capital Improvement Plan	Prevention
<u>Flood Mitigation Ideas</u>	<u>Type of Project</u>
• Storm Water Management Ordinances.....	Prevention
• Floodplain Ordinances	Prevention
• Updated Floodplain Mapping	Prevention
• Watershed Management	Natural Resource Protection
• Drainage Easements.....	Prevention
• Purchase of Easements	Prevention
• Wetland Protection	Natural Resource Protection
• Structural Flood Control Measures	Prevention
• Bridge Replacement.....	Structural Project
• Dam Removal.....	Structural Project
• NFIP Compliance	Prevention
• Acquisition, Demolition & Relocation	Structural Project
• Structure Elevation	Structural Project
• Flood Proofing	Property Protection
• Erosion Control.....	Natural Resource Protection
• Floodplain/Coastal Zone Management	Prevention
• Building Codes Adoption or Amendments	Prevention
• Culvert & Hydrant Maintenance	Prevention
• Culvert & Drainage Improvements	Structural Protection
• Transfer of Development Rights	Property Protection

Natural Hazard Mitigation Ideas

Type of Project

Landslide

- Slide-Prone Area Ordinance..... Prevention
- Drainage Control Regulations..... Prevention
- Grading Ordinances..... Prevention
- Hillside Development Ordinances..... Prevention
- Open Space Initiatives..... Prevention
- Acquisition, Demolition & Relocation..... Structural Project
- Vegetation Placement and Management..... Natural Resource Protection
- Soil Stabilization..... Natural Resource Protection

Thunderstorms & Lightning

- Building construction..... Property Protection

Tornado & Severe Wind

- Construction Standards and Techniques..... Property Protection
- Safe Rooms..... Prevention
- Manufactured Home Tie Downs..... Property Protection
- Building Codes..... Property Protection

Wildfire

- Building Codes..... Property Protection
- Defensible Space..... Prevention
- Forest fire fuel reduction..... Prevention
- Burning Restriction..... Property Protection
- Water Resource Plan..... Prevention
- Firewise Training & Brochures..... Public Awareness
- Woods Roads Mapping..... Prevention

Extreme Temperatures

- Warming & Cooling Stations..... Prevention

Winter Weather Snowstorms

- Snow load design standards..... Property Protection

Subsidence

- Open Space..... Natural Resource Protection
- Acquisition, Demolition & Relocation..... Structural Project

Earthquake

- Construction Standards and Techniques..... Property Protection
- Building Codes..... Property Protection
- Bridge Strengthening..... Structural Project
- Infrastructure Hardening..... Structural Project

Drought

- Water Use Ordinances..... Prevention

C. STAPLEE Methodology

Table 8.1, *Potential Mitigation Items & the STAPLEE*, reflects the newly identified potential hazard and wildfires mitigation action items as well as the results of the STAPLEE evaluation as explained below. It should also be noted that although some areas are identified as “All Hazards”, many of these would apply indirectly to wild fire response and capabilities. Many of these potential mitigation action items overlap.

The goal of each proposed mitigation action item is “to reduce or eliminate the long-term risk to human life and property from hazards”. To determine the effectiveness of each mitigation action item in accomplishing this goal, a set of criteria that was developed by FEMA, the STAPLEE method, was applied to each proposed action item.

The STAPLEE method analyzes the **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic and **E**nvironmental 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 action items discussed in Table 8.1.

Social: Is the proposed action item 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 action item work? Will it create more problems than it solves?

Administrative: Can the Community implement the action item? Is there someone to coordinate and lead the effort?

Political: Is the action item politically acceptable? Is there public support both to implement and to maintain the project?

Legal: Is the Community authorized to implement the proposed action item? Is there a clear legal basis or precedent for this activity?

Economic: What are the costs and benefits of this action item? Does the cost seem reasonable for the size of the problem and the likely benefits?

Environmental: How will the action item impact the environment? Will it need environmental regulatory approvals?

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

3 - Good 2 - Average 1 - Poor

An evaluation chart with total scores for each new action item is shown in Table 8.1.

The “Type” of Action Item was also considered to be (see section A of this chapter) for more reference):

- **Prevention**
- **Public Education & Awareness**
- **Emergency Service Protection**
- **Property Protection**
- **Natural Resource Protection**
- **Structural Projects**

D. Team’s Understanding of Hazard Mitigation Action Items

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 Table 8.1 and *Table 9.1, The Mitigation Action Plan*, are fundable under FEMA pre-mitigation guidelines. The Team determined that this Plan was in large part a management document designed to assist the Board of Selectmen and other town officials in all aspects of managing and tracking potential emergency planning action items. For instance, the Team was aware that some of these action items are more properly identified as preparedness or readiness issues. As there are no other established planning mechanisms that recognize some of these 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.

Also, it should be noted that the Town understands that the “Mitigation Action Items” for a town of 200 are not the same as the “Mitigation Action Items” for a town of 30,000. In addition, the “Mitigation Action Items” for a town in the middle of predominantly hardwood forests, are not the same as the “Mitigation Action Items” for a town on the Jersey Shore. Therefore the Town of Wentworth has accepted the “Mitigation Action Items” in Tables 8.1 and 9.1 as the complete list of “Mitigation Action Items” for this Town and hereby indicates that having carefully considered a comprehensive list of other possible mitigation action items (see sections A & B of this chapter) for this Plan, there are no additional “Mitigation Action Items” to add at this time.

TABLE 8.1: POTENTIAL MITIGATION ACTION ITEMS & THE STAPLEE

- **Potential mitigation action items in Table 8.1 on the following page are listed in numerical order and indicate if they were derived from prior tables in this Plan, i.e., (Table 7.1).**
- **Items in green such as (MU14) represent mitigation action items taken from Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013; see *Appendix E: Potential Mitigation Ideas*, for more information.**

Action Items are listed in numerical order.

Potential Mitigation Action Item	Affected Location	Type of Activity	TTL	S	T	A	P	L	E	E
Action Item #1: Obtain one town-wide frequency for all departments. (Table 7.1)	Town Wide	Emergency Service Protection	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #2: Get this Hazard Mitigation Plan approved as a Community Wildfire Protection Plan through DRED so that the Town may be able to work with the State and Federal governments on future wildfire mitigation projects such as the clearing of slash on the forest floor and the clearing of dangerous fuel loads. (WF9) (Table 7.1)	Town Wide	Property Protection & Natural Resource Protection	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #3: Conduct/run drills to ensure readiness for response to school emergencies. (Table 7.1)	Wentworth Elementary School	Emergency Service Protection	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #4: Implement program to provide training to fire personnel on wildland fire suppression, dry hydrant design, and site evaluations of water resources. (Table 7.1)	Town Wide	Emergency Service Protection	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #5: Continue to provide HazMat and other appropriate training for emergency personnel through Lakes Region Fire Mutual Aid and the Fire Academy to insure the best possible response at the time of a HazMat incident. (Table 7.1)	Town Wide	Emergency Service Protection	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #6: Gather information relevant for hydrant construction (seasonal water level, area available for apparatus, static lift). Site WE 020. (Rural Fire Water Resource Plan & Table 7.1)	North Dorchester Road	Prevention	19	3	3	3	3	3	2	2
				Economic: Budget Constraints Environmental: DES Approvals						
Action Item #7: During the next update of the Subdivision Regulation, review and incorporate concepts from this Hazard Mitigation Plan and from the Rural Fire Water Resource Plan. (WF2); encourage referral to the Rural Fire Water Resource Plan when reviewing subdivision proposals; obtain a copy of the Plan from NCRC&D. (Table 7.1)	Town Wide	Prevention	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #8: Develop and maintain program to cut tree and limbs near power lines and homes in an effort to lessen the impact of high wind events and to allow better access by emergency response vehicles. (Table 7.1)	Town Wide	Prevention & Emergency Service Protection	20	3	3	3	3	3	2	3
				Economic: Budget Constraints						

Potential Mitigation Action Item	Affected Location	Type of Activity	TTL	S	T	A	P	L	E	E
Action Item #9: Update the Wentworth Emergency Operations Plan, identify the Emergency Operations Center and include annexes for dam failure and dam sites in Town. (Tables 6.1 & Table 7.1)	Town Wide	Prevention & Emergency Service Protection	20	3	3	2	3	3	3	3
				Administrative: May be difficult to get the staff together this done						
Action Item #10: NIMS & ICS Training for Town Officials in order to have better trained individuals handling disaster events so that the effects of the event can be mitigated. (ICS 100 & 200; NIMS 700). (Tables 6.1 & Table 7.1)	Town Wide	Prevention & Emergency Service Protection	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #11: Complete the replacement of Evans Bridge using state and local funding to allow this bridge to be used for evacuation and so that it can withstand the effects of flooding. (MU13) (Table 7.1)	Evans Bridge on Evans Road	Structural Projects	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #12: To insure the safe passage of vehicular traffic including emergency response, upgrade, replace or retrofit Dufour Bridge using state and local funding. (MU13) (Table 7.1)	Dufour Bridge	Structural Projects	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #13: Obtain and install a generator at the Wentworth Town Office/Police Station. for the protection of this critical facility that is not only the Police Station but also the secondary EOC and important for continuity of government. (MU13) (Tables 6.1 & Table 7.1)	Wentworth Town Office/Police Station	Emergency Service Protection	19	3	3	3	2	3	2	3
				Political: Some may not see the need to spend the money; Economic: Budget Constraints						
Action Item #14: Obtain and install a generator at the Wentworth Elementary School for the protection of this critical facility as this is the designated Primary Shelter. (MU13) (Tables 6.1 & Table 7.1)	Wentworth Elementary School	Emergency Service Protection	17	3	3	3	1	3	1	3
				Political: Some may not see the need to spend the money; Economic: Budget Constraints						
Action Item #15: Build a new Fire Station to improve the Town's capability to respond to wildfires and other hazardous events.	Town Wide	Emergency Service Protection	18	3	2	3	3	3	1	3
				Technical: The Town will have to find and obtain land for this project Economic: Budget Constraints						
Action Item #16: Obtain and install a generator for the protection of this critical facility that is not only a Fire Station but also the designated Primary EOC; this would be for the new Wentworth Fire House when and if it is completed. (MU13) (Tables 6.1 & Table 7.1)	Town Wide	Emergency Service Protection	19	3	2	3	3	3	2	3
				Technical: The Town will have to find and obtain land for this project Economic: Budget Constraints						
Action Item #17: Update the Master Plan to reflect changing needs of the community and to maintain public health and safety; include elements from this Hazard Mitigation Plan in the Master Plan update; next update planned to be completed by 2018. (Tables 6.1 & Table 7.1)	Town Wide	Prevention	17	3	3	1	3	3	1	3
				Administrative: May be difficult to get the staff time to do this; Political: Some people may not want to see this project done Economic: Budget Constraints						

Potential Mitigation Action Item	Affected Location	Type of Activity	TTL	S	T	A	P	L	E	E
Action Item #18: Review and discuss the possibility of revising the current subdivision regulations to consider onsite water storage, minimum fire flow, and fire breaks in WUI. (WF2) (Table 7.1)	Town Wide	Prevention	20	3	3	3	2	3	3	3
				Political: People don't like change and regulations						
Action Item #19: Upgrade the two culverts on Rowentown Road at Smith Bridge with a new bridge or a single larger culvert in order to improve storm water management and to mitigate flooding. (F13) (Table 7.1)	Rowentown Road	Structural Projects	19	3	3	3	3	3	2	2
				Economic: Budget Constraints Environmental: DES Approvals						
Action Item #20: Site and construct a cistern =/<30,000 gallons at the Wentworth Elementary School which is the designated primary shelter to improve firefighting capabilities. (WF6) (Table 7.1)	Wentworth Elementary School	Structural Projects	18	3	3	3	2	3	1	3
				Political: May not get accepted by the Town Economic: Budget Constraints						
Action Item #21: Provide public outreach about CodeRED to encourage residents to register with Grafton County Code RED to add cell numbers, email, unlisted numbers and to verify information; invite the Grafton County Sheriff's Department to come to an open Town meeting to explain CodeRED to the public; use an emergency page on the Town's website or other means of outreach to continuously remind the public of the importance of CodeRED to improve household disaster preparedness (MU15). (Tables 6.1 & Table 7.1)	Town Wide	Prevention	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #22: Contact the White Mountain National Forest to discuss the method of departure from logging sites so that temporary culverts can remain in place thus allowing better access to forested lands for firefighting. (Table 6.1)	Areas of town included in White Mountain National Forest	Prevention	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #23: The Capital Reserve Funds should be reviewed to determine whether to change, create or update new CRFs for alternative projects; re-evaluate needs and funding allocations. (Table 6.1)	Town-wide	Prevention	19	3	3	3	2	2	3	3
				Political: Some may question why we are doing this Legal: Will need to be voted at Town Meeting through a warrant article						
Action Item #24: Complete the review and update of the School Emergency Response Plan. (Table 6.1)	Wentworth Elementary School	Prevention	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						

Potential Mitigation Action Item	Affected Location	Type of Activity	TTL	S	T	A	P	L	E	E
Action Item #25: The Town should issue a flyer, make announcements at Select Board meetings, post notice on the Town's website and/or solicit the help of special groups such as the Boy Scouts to get additional E-911 signage complete in an effort to provide information on all types of preparedness. (MU14). (Table 6.1)	Town Wide	Public Education & Awareness	20	3	3	3	2	3	3	3
				Political: Some residents may not want their 911 number posted						
Action Item #26: Develop an emergency information brochure and add an emergency page to the Town's website; Establish an interactive webpage for educating the public on hazard mitigation and preparedness measures (MU14) by adding a page to the Town's recently enhanced website that will include such information as emergency contacts, shelter locations, evacuation routes (SW7, WF11 & T3), methods of emergency alerting, 911 compliance, water saving techniques (D9), earthquake risk and mitigation activities that can be taken in residents' homes (EQ7), steps homeowners can take to protect themselves and their properties when extreme temperatures occur (ET1 & ET4), safety measures that can be taken during hail (HA3) and lightning storms (L2), mitigation techniques for property protection and links to available sources; educate homeowners regarding the risks of building in hazard zones and encourage homeowners to install carbon monoxide monitors and alarms (WW5).	Town Wide	Public Education & Awareness	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #27: Advise the public about the local flood hazard, flood insurance and flood protection measures (F10) by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Offices; give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether or not they are in the flood zone and provide appropriate links to the NFIP and Ready.gov on the Town's website.	Town Wide	Public Education & Awareness	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #28: Obtain and have available "Firewise" brochures to educate homeowners on methods to reduce fire risk around their homes (WF10); provide "Firewise" brochures to those residents seeking burn permits; advise residents of the importance of maintaining defensible space, the safe disposal of yard and household water and the removal of dead or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches and yards. (WF12)	Town Wide	Public Education & Awareness	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						

Potential Mitigation Action Item	Affected Location	Type of Activity	TTL	S	T	A	P	L	E	E
Action Item #29: Through Public Outreach and the Town's website, educate homeowners regarding the risks of building in the flood zone and measures that can be taken to reduce the chance of flooding; include information regarding the risks of driving on flooded roads, securing debris and keeping storm drains clear. (F22 & F23)	Town Wide	Public Education & Awareness	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #30: Advise residents who live on private roads of the importance of maintaining their roads for first responders; add information to the Town's website. (WF8)	Class VI & Private Roads	Public Education & Awareness	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #31: Prepare a stormwater drainage plan to assess ditch capacity in Town and seek funding to repair ditches that are not adequately directing the flow of rain water and snow melt; various areas of town. (F5)	Town Wide	Prevention	20	3	3	3	3	3	2	3
				Economic: Budget Constraints						
Action Item #32: Join NH Municipal Mutual Aid for Public Works.	Town Wide	Prevention	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						
Action Item #33: Mail or distribute "courtesy notifications" to resources that are mentioned in this plan as determined by the EMD.	Town Wide	Prevention	21	3	3	3	3	3	3	3
				No apparent difficulty with this action item.						

Chapter 9: Implementation Schedule for Prioritized Action Items

A. Priority Methodology

After reviewing the finalized STAPLEE numerical ratings, the Team prepared to develop *Table 9.1, The Mitigation Action Plan*. To do this, team members created four categories into which they would place the potential mitigation action items.

- **Category 0** was to include those items which are being done and will continue to be done in the future.
- **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 to complete.
- **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 action item was placed in one of these four categories and then those action items were prioritized within each category according to cost-benefit, time frame and capability. Actual cost estimates were unavailable during the planning process, although using the STAPLEE process along with the methodology detailed above and a Low-High estimate (see following page) the Team was able to come up with a general consensus on cost-benefit for each proposed action item.

The Team also considered the following criteria while ranking and prioritizing each action item:

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

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

B. Who, When, How?

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

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 action items, *Table 9.1, The Mitigation Action 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 9.1: THE MITIGATION ACTION PLAN

Table 9.1, The Mitigation Action Plan, located on the next page, includes Problem Statements that were expressed by the Planning Team. These action items are listed in order of priority and indicate if they were derived from prior tables in this Plan.

The estimated cost was determined using the following criteria:

- **Low** (\$0 - \$1,000 or staff time only)
- **Medium** (\$1,000 - \$10,000)
- **High** (\$10,000 or more)



Items in green such as (MU14) represent mitigation action items taken from Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013; see *Appendix E: Potential Mitigation Ideas*, for more information.

Mitigation Action Items are listed in order of priority.

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
0-1	<p>Problem Statement: <i>Since the development of the last Hazard Mitigation Plan, drills have been done in coordination with the School, Fire and Police Departments. These drills will continue on an annual basis.</i></p> <p>Action Item #3: Conduct/run drills to ensure readiness for response to school emergencies. (Table 7.1)</p>	All Hazards	School Principal, Fire Chief & Police Chief	Local	Annually as recommended by the State, 2014-2019	Low (Staff Time)
0-2	<p>Problem Statement: <i>Some Capital Reserve Funds may be too specific and therefore may not be able to be used for some projects/purchases.</i></p> <p>Action Item #23: The Capital Reserve Funds should be reviewed to determine whether to change, create or update new CRFs for alternative projects; re-evaluate needs and funding allocations. (Table 6.1)</p>	All Hazards	Board of Selectmen	Local	During annual December budget review, 2014-2019	Low
0-4	<p>Problem Statement: <i>The Town's ditch system does not work effectively to drain and direct water flow during times of rapid snow melt or heavy rain.</i></p> <p>Action Item #31: Prepare a stormwater drainage plan to assess ditch capacity in Town and seek funding to repair ditches that are not adequately directing the flow of rain water and snow melt; various areas of town. (F5)</p>	Flooding	Board of Selectmen	Local	Program to be reviewed annually and ditch repairs made as needed, 2014-2019	Low
0-5	<p>Problem Statement: <i>A hazardous materials accident on Route 25 has the potential to create a significant hazardous materials event; local emergency responders, including new hires, need continued training to handle this type of event.</i></p> <p>Action Item #5: Continue to provide HazMat and other appropriate training for emergency personnel through Lakes Region Fire Mutual Aid and the Fire Academy to insure the best possible response at the time of a HazMat incident. (Table 7.1)</p>	Hazardous Material Fixed or Transport	Fire Chief	Local	Continuing education as recommended and as there are new hires, 2014-2019	Low

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
0-6	<p>Problem Statement: <i>Not all Town Officials (those who would respond at the time of an emergency) have been trained in ICS 100 & 200 and NIMS 700.</i></p> <p>Action Item #10: NIMS & ICS Training for Town Officials in order to have better trained individuals handling disaster events so that the effects of the event can be mitigated. (ICS 100 & 200; NIMS 700). (Tables 6.1 & Table 7.1)</p>	All Hazards	EMD	Local	Continuing and as recommended and as there are new hires or elected officials, 2014-2019	Low (Staff Time)
0-7	<p>Problem Statement: <i>The Town's fire department participates in annual fire training sponsored by the Lakes Region Fire Mutual Aid Association and by the NH Fire Academy; this training continues on a regular basis and is part of emergency preparedness for the Town.</i></p> <p>Action Item #4: Implement program to provide training to fire personnel on wildland fire suppression, dry hydrant design and site evaluations of water resources. (Table 7.1)</p>	Wildfires	Fire Chief	Local	Continuing education as recommended and as there are new hires, 2014-2019	Low
0-8	<p>Problem Statement: <i>High winds can create property damage from fallen trees, limbs and branches and can make any hazard worse by knocking down power lines.</i></p> <p>Action Item #8: Develop and maintain program to cut tree and limbs near power lines and homes in an effort to lessen the impact of high wind events and to allow better access by emergency response vehicles. (Table 7.1)</p>	All Hazards	Board of Selectmen	Local	Program to be reviewed annually and trim trimming to be done as needed, 2014-2019	High
0-3	<p>Problem Statement: <i>CodeRED is an excellent warning system but it only stores resident phone numbers that are listed in the phone book.</i></p> <p>Action Item #21: Provide public outreach about CodeRED to encourage residents to register with Grafton County Code RED to add cell numbers, email, unlisted numbers and to verify information; invite the Grafton County Sheriff's Department to come to an open Town meeting to explain CodeRED to the public; use an emergency page on the Town's website or other means of outreach to continuously remind the public of the importance of CodeRED to improve household disaster preparedness (MU15). (Tables 6.1 & Table 7.1)</p>	All Hazards	Police Chief	Local	Maintain a continuous campaign to have residents register with CodeRED, 2014-2019	Low

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
0-9	<p><i>Problem Statement: The Rural Fire Water Resource Plan was not referred to by the Planning Board when reviewing subdivision proposals.</i></p> <p>Action Item #7: During the next update of the Subdivision Regulation, review and incorporate concepts from this Hazard Mitigation Plan and from the Rural Fire Water Resource Plan. (WF2); encourage referral to the Rural Fire Water Resource Plan when reviewing subdivision proposals; obtain a copy of the Plan from NCRC&D. (Table 7.1)</p>	Wildfires	Planning Board	Local	By the Planning Board whenever there is a review if the Subdivision Regulations and new subdivision proposals, 2014-2019	Low
1-1	<p><i>Problem Statement: The Town's Highway Department may not have sufficient equipment to handle hazard events; the Town does not belong to the NH Municipal Mutual Aid for Public Works; this association will help the Highway Department get additional equipment if needed.</i></p> <p>Action Item #32: Join NH Municipal Mutual Aid for Public Works.</p>	All Hazards	Board of Selectmen & Highway Department	Local	12/31/2014	Low
1-2	<p><i>Problem Statement: Evans Bridge needs to be replaced as it is old and deteriorated and is "red-flagged".</i></p> <p>Action Item #11: Complete the replacement of Evans Bridge using state and local funding to allow this bridge to be used for evacuation and so that it can withstand the effects of flooding. (MU13) (Table 7.1)</p>	Flooding & Evacuation Issue	Board of Selectmen	Local & State	05/09/15	High
1-3	<p><i>Problem Statement: The Town of Wentworth is in the process of finalizing a town-wide license; frequencies are in place but the licensing is not complete.</i></p> <p>Action Item #1: Obtain one town-wide frequency for all departments. (Table 7.1)</p>	All Hazards	Board of Selectmen	Local	05/09/15	Medium

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
1-4	<p>Problem Statement: <i>The current School Emergency Response Plan is under review in light of recent events at the end of 2012 in Connecticut.</i></p> <p>Action Item #24: Complete the review and update of the School Emergency Response Plan. (Table 6.1)</p>	All Hazards	School Board & Fire & Police Chiefs	Local	12/31/2014	Low
1-5	<p>Problem Statement: <i>Approximately 50% of the Town's housing units are not compliant with E-911 signage thus making it difficult for emergency responders to locate homes.</i></p> <p>Action Item #25: The Town should issue a flyer, make announcements at Select Board meetings, post notice on the Town's website and/or solicit the help of special groups such as the Boy Scouts to get additional E-911 signage complete in an effort to provide information on all types of preparedness. (MU14). (Table 6.1)</p>	All Hazards	Police Chief	Local	7/15/2015	Low
1-6	<p>Problem Statement: <i>The current subdivision regulations have not included regulations for fire suppression.</i></p> <p>Action Item #18: Review and discuss the possibility of revising the current subdivision regulations to consider onsite water storage, minimum fire flow and fire breaks in WUI. (WF2) (Table 7.1)</p>	Wildfires	Planning Board & Board of Selectmen	Local	8/15/2015	Low
1-7	<p>Problem Statement: <i>Residents and builders may not be aware of flood regulations & the availability of flood insurance through the NFIP for all people, even if not in the flood zone.</i></p> <p>Action Item #27: Advise the public about the local flood hazard, flood insurance and flood protection measures (F10) by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Offices; give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether or not they are in the flood zone and provide appropriate links to the NFIP and Ready.gov on the Town's website.</p>	Flooding	Board of Selectmen & Fire and Police Chiefs	Local	6/30/2015	Low

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
1-8	<p><i>Problem Statement: Residents may not be aware of the steps they can take to reduce the risk of fire at their homes.</i></p> <p>Action Item #28: Obtain and have available "Firewise" brochures to educate homeowners on methods to reduce fire risk around their homes (WF10); provide "Firewise" brochures to those residents seeking burn permits; advise residents of the importance of maintaining defensible space, the safe disposal of yard and household water and the removal of dead or dry leaves, needles, twigs and combustible materials from roofs, decks, eaves, porches and yards. (WF12)</p>	Wildfires	Board of Selectmen & Fire and Police Chiefs	Local	3/31/2014	Low
1-9	<p><i>Problem Statement: Residents are not aware of emergency procedures or preventative mitigation techniques that can be done to protect their lives and property.</i></p> <p>Action Item #26: Develop an emergency information brochure and add an emergency page to the Town's website; Establish an interactive webpage for educating the public on hazard mitigation and preparedness measures (MU14) by adding a page to the Town's recently enhanced website that will include such information as emergency contacts, shelter locations, evacuation routes (SW7, WF11 & T3), methods of emergency alerting, 911 compliance, water saving techniques (D9), earthquake risk and mitigation activities that can be taken in residents' homes (EQ7), steps homeowners can take to protect themselves and their properties when extreme temperatures occur (ET1 & ET4), safety measures that can be taken during hail (HA3) and lightning storms (L2), mitigation techniques for property protection and links to available sources; educate homeowners regarding the risks of building in hazard zones and encourage homeowners to install carbon monoxide monitors and alarms (WW5).</p>	All Hazards including: Severe Wind, Drought, Earthquake, Extreme Temperatures, Hail, Lightning, Severe Winter Weather, Tornado & Wildfire	Board of Selectmen & Fire and Police Chiefs	Local	6/30/2015	Low

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
1-10	<p><i>Problem Statement: The Wentworth EOP has not been updated since 2000.</i></p> <p>Action Item #9: Update the Wentworth Emergency Operations Plan, identify the Emergency Operations Center and include annexes for dam failure and dam sites in Town. (Tables 6.1 & Table 7.1)</p>	All Hazards	EMD	Local/Grants	12/31/2014	Low
1-11	<p><i>Problem Statement: Residents may not be aware of the factors that impede emergency response.</i></p> <p>Action Item #30: Advise residents who live on private roads of the importance of maintaining their roads for first responders; add information to the Town's website. (WF8)</p>	Wildfire & All Hazards	Board of Selectmen & Fire and Police Chiefs	Local	6/30/2015	Low
1-12	<p><i>Problem Statement: Although the 2009 Hazard Mitigation Plan addressed wildfire fire issues and was planned to be a Community Wildfire Protection Plan, the Plan was never officially approved by DRED.</i></p> <p>Action Item #2: Get this Hazard Mitigation Plan approved as a Community Wildfire Protection Plan through DRED so that the Town may be able to work with the State and Federal governments on future wildfire mitigation projects such as the clearing of slash on the forest floor and the clearing of dangerous fuel loads. (WF9) (Table 7.1)</p>	Wildfires	Mapping & Planning Solutions & DRED	N/A	03/31/15	No Cost to Town
1-13	<p><i>Problem Statement: The WMNF have done major cuts in parts of town and they remove culverts when complete, thus disabling access to fire roads.</i></p> <p>Action Item #22: Contact the White Mountain National Forest to discuss the method of departure from logging sites so that temporary culverts can remain in place thus allowing better access to forested lands for firefighting. (Table 6.1)</p>	Wildfires	Board of Selectmen & Fire Chief/EMD	Local	6/30/2015	Low

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
1-14	<p>Problem Statement: Those entities mentioned in the Plan that are considered possible resources for food, water, gas, lodging, landing zones, etc. are not aware of the role they may have to play during an hazard event.</p> <p>Action Item #33: Mail or distribute "courtesy notifications" to resources that are mentioned in this plan as determined by the EMD.</p>	All Hazards	Police Chief	Local	3/31/2015	Low
1-15	<p>Problem Statement: Residents may not be aware of the risk of building in the floodplain and the steps they can take to reduce flooding and the damage associated with flooding.</p> <p>Action Item #29: Through Public Outreach and the Town's website, educate homeowners regarding the risks of building in the flood zone and measures that can be taken to reduce the chance of flooding; include information regarding the risks of driving on flooded roads, securing debris and keeping storm drains clear. (F22 & F23)</p>	Flooding	Board of Selectmen & Fire and Police Chiefs	Local	6/30/2015	Low
2-1	<p>Problem Statement: Dufour Bridge needs to be replaced as it is old and deteriorated and is "red-flagged".</p> <p>Action Item #12: To insure the safe passage of vehicular traffic including emergency response, upgrade, replace or retrofit Dufour Bridge using state and local funding. (MU13) (Table 7.1)</p>	Flooding & Evacuation Issue	Board of Selectmen	Local & State	9/1/2015	High
2-2	<p>Problem Statement: A generator has not been installed at the Wentworth Elementary School (Primary Shelter) since the last hazard mitigation plan due to budget constraints.</p> <p>Action Item #14: Obtain and install a generator at the Wentworth Elementary School for the protection of this critical facility as this is the designated Primary Shelter. (MU13) (Tables 6.1 & Table 7.1)</p>	All Hazards	School Board & EMD	Local/Grants	7/31/2016	High

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
2-3	<p>Problem Statement: A generator has not been installed at the Wentworth Town Office/Police Station (Records & Administration, Police & EOC) since the last hazard mitigation plan due to budget constraints.</p> <p>Action Item #13: Obtain and install a generator at the Wentworth Town Office/Police Station for the protection of this critical facility that is not only the Police Station but also the secondary EOC and important for continuity of government. (MU13) (Tables 6.1 & Table 7.1)</p>	All Hazards	Board of Selectmen & EMD	Local/Grants	6/30/2016	High
3-1	<p>Problem Statement: The last Master Plan was created in 1986 and has not had an update since.</p> <p>Action Item #17: Update the Master Plan to reflect changing needs of the Community and to maintain public health and safety; include elements from this Hazard Mitigation Plan in the Master Plan update; next update planned to be completed by 2018. (Tables 6.1 & Table 7.1)</p>	All Hazards	Planning Board	Local/Grants	12/31/2018	Medium
3-2	<p>Problem Statement: Water resources need to be improved near the Wentworth Elementary School.</p> <p>Action Item #20: Site and construct a cistern =/ < 30,000 gallons at the Wentworth Elementary School which is the designated primary shelter to improve firefighting capabilities. (WF6) (Table 7.1)</p>	Wildfires	School Board & EMD	Local/Grants	7/31/2016	High
3-3	<p>Problem Statement: The current Fire Station is old and deteriorated and does not have enough space.</p> <p>Action Item #15: Build a new Fire Station to improve the Town's capability to respond to wildfires and other hazardous events.</p>	All Hazards	Fire Chief/EMD	Local/Grants	7/31/2017	High

Rank	Problem Statement Mitigation Action Item	Type of Hazard	Responsibility or Oversight	Funding or Support	Timeframe	Estimated Cost
3-4	<p><i>Problem Statement: The Town is anticipating the construction of a new Fire House and it will need a permanent generator.</i></p> <p>Action Item #16: Obtain and install a generator for the protection of this critical facility that is not only a Fire Station but also the designated Primary EOC; this would be for the new Wentworth Fire House when and if it is completed. (MU13) (Tables 6.1 & Table 7.1)</p>	All Hazards	Fire Chief/EMD	Local/Grants	7/31/2017	High
3-5	<p><i>Problem Statement: Two culverts on Rowentown Road at Smith Bridge have been repaired, but they are not as efficient as they should be and consistently underperform.</i></p> <p>Action Item #19: Upgrade the two culverts on Rowentown Road at Smith Bridge with a new bridge or a single larger culvert in order to improve storm water management and to mitigate flooding. (F13) (Table 7.1)</p>	Flooding	Board of Selectmen	Local/Grants	4/30/2018	High
3-6	<p><i>Problem Statement: Dry hydrant construction at North Wentworth Road (South Wentworth Drive) was not completed due to limited personnel, time, money and permitting issues; this should still be completed.</i></p> <p>Action Item #6: Gather information relevant for hydrant construction (seasonal water level, area available for apparatus, static lift). Site WE 020. (Rural Fire Water Resource Plan & Table 7.1)</p>	Wildfires	Board of Selectmen & Fire Chief	Local & Grants	5/9/2018	High

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Chapter 10: Adopting, Monitoring, Evaluating and Updating the Plan

A. Hazard Mitigation Plan Monitoring, Evaluation and Updates

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 stages. A good plan will incorporate periodic monitoring and evaluation mechanisms to allow for review of successes and failures or even just simple updates. The Emergency Management Director is responsible for initiating Plan reviews and will consult with members of the hazard mitigation planning team identified in this Plan.

The Wentworth Hazard Mitigation Plan Update 2014 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 action items were successful. This review will focus on the assessment of the Plan's effectiveness, accuracy and completeness in monitoring of the implementation action item. The review will also address recommended improvements to the Plan as contained in the FEMA plan review checklist and address any weaknesses the Town identified that the Plan did not adequately address.
- Second, the Plan will be thoroughly updated every five years.
- 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.

In keeping with the process of adopting this hazard mitigation plan, the public and stakeholders will have the opportunity for future involvement as they will be invited to participate in any and all future reviews or updates of this Plan. Public notice before any review or update will be given by such means as: press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state and local organizations impacted by the Plan and posting notices in public places in the Town. This will ensure that all comments and revisions from the public and stakeholders will be considered. The Emergency Management Director insures that these actions will be done.

Concurrence forms to be used for post-hazard or annual reviews are available in Chapter 11 of this Plan. The Town is encouraged to use these forms to document any changes and accomplishments since the development of this Plan. Forms are available for years 1-4, with expectation that the five-year annual update will be in process during the fifth year.

B. Integration with Other Plans

This Plan will only enhance mitigation if balanced with all other town plans. Wentworth completed its last hazard mitigation plan in 2009 and has completed many of projects from that Plan. The Town was able to integrate these actions into other town activities, plans and mechanisms. Wentworth will continue to take the necessary steps to incorporate the mitigation action items and other information contained in this Plan with other town activities, plans and mechanisms, when appropriate. The Town will incorporate elements from this Plan into the following documents:

Wentworth Master Plan:

Traditionally, Master Plans are updated every 5 to 10 years and detail the use of capital reserves funds and capital improvements within the Town. Wentworth's Master Plan was created in 1986 and an update has not been done; following the recommended 10-year plan, Wentworth is well past the recommended date for an update of the Master Plan. Updating the Master Plan was discussed during meetings with the Hazard Mitigation Planning Team and it was suggested that an update be done in the near future. Future updates of the Master Plan will integrate concepts and ideas from this Hazard Mitigation Plan. **(Action Item #17)**

Wentworth Emergency Operations Plan 2014 (EOP):

The EOP is designed to allow the Town to respond more effectively to disasters as well as mitigate the risk to people and property; EOPs are generally reviewed after each hazardous event and updated on a five-year basis. The Wentworth EOP is currently in the process of being updated. The new EOP will include elements from this hazard mitigation plan. **(Action Item #9)**

Town Budget & Capital Reserve Funds:

The Town of Wentworth does not have a Capital Improvement Plan and has no intentions in the near future to establish one. However, the Town maintains Capital Reserve Funds for major expenditures; this fund is adjusted annually in coordination with the Board of Selectmen and the Town's department heads at budget time. The budget is then voted on at the annual Town Meeting. During the annual budget planning process, specific mitigation actions identified in this Plan that require Town fiscal support will be reviewed for incorporation into the budget. **Refer to those Action Items that require local money or match money in conjunction with state or federal grant.**

Ordinances & Subdivision Regulations:

As time goes by and the needs of the Town change, these ordinances will be reviewed and updated. In coordination with these actions, the Planning Board will review this Hazard Mitigation Plan and the Rural Water Fire Resource Plan and incorporate any changes that help mitigate the susceptibility of the Community and its citizens to the dangers of natural or human-caused disasters. An example of this integration can be seen in this Plan's mitigation action items. **(Action Items #7 &18)**

The local governments will modify other plans and actions as necessary to incorporate hazard and/or wildfire issues; the Board of Selectmen 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.

C. Plan Approval & Adoption

The Plan was presented to the This Plan was completed in a series of open meetings beginning on November 14, 2012. The Plan was presented to the Town for review, submitted to FEMA for Conditional Approval (*APA, Approved Pending Adoption*), formally adopted by the Board of Selectmen and resubmitted to FEMA for Final Approval. Once Final Approval from FEMA was met, 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 Mapping and Planning Solutions (MAPS) in both digital and paper format.

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).

(Note: for the purposes of clarity, the above paragraph was written in future tense, noting that these actions have not yet transpired – this box will be deleted when final hard copy is distributed)



Wentworth Town Office
Photo Credit: MAPS

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Chapter 11: Signed Community Documents and Approval Letters

A. Planning Scope of Work & Agreement



PLANNING SCOPE OF WORK & AGREEMENT

HAZARD MITIGATION PLAN Date Revised

Parties to the Agreement

The Town of Wentworth, NH
Mapping and Planning Solutions

Date of the Agreement

November 14, 2012

This Agreement between the Town of Wentworth (the Town) or its official designee and Mapping and Planning Solutions (MAPS) outlines the Town’s desire to engage the services of MAPS to assist in planning and technical services in order to produce the 2013 Hazard Mitigation Plan Update (the Plan).

Agreement

This Agreement outlines the responsibilities that will ensure that the Plan is developed in a manner that involves community members and local, federal and state emergency responders and organizations. The Agreement identifies the work to be done by detailing the specific tasks, schedules and finished products that are the result of the planning process.

The goal of this Agreement is that the Plan and planning process be consistent with Town policies and that it accurately reflects the values and individuality of the community. This is accomplished by forming a working relationship between the Town’s citizens, the planning team and MAPS.

The Plan created as a result of this Agreement will be presented to the Town for adoption once conditional approval is received from FEMA. When adopted, the Plan provides guidance to the Town, commissions, and departments; adopted plans serve as a guide and do not include any financial commitments by the Town. Additionally, all adopted plans should address mitigation action items for reducing the risk of natural, man-made, and wildfire disasters on life and property and written so that they may be integrated within other community planning initiatives.

Scope of Work

MAPPING AND PLANNING SOLUTIONS’ RESPONSIBILITIES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

- MAPS will collect data that is necessary to complete the Plan and meet the requirements of the FEMA Crosswalk by working with the planning team and taking public input from community members.
- With the assistance of the planning team, MAPS will coordinate and facilitate meetings and provide any materials, handouts and maps necessary to provide a full understanding of each step in the planning process.
- MAPS will assist the Team in the development of goals, objectives and implementation action items and clearly define the processes needed for future Plan monitoring, educating the public and integrating the Plan with other Town plans and activities.
- MAPS will coordinate and collaborate with other federal, state and local agencies throughout the process.

- MAPS will explain and delineate the community’s Wildland Urban Interface (WUI) and, working with the Team, will establish a list of potential hazards and analyze the risk severity of each.
- MAPS will author, edit and prepare the Plan for review by the Team prior to submitting the Plan to FEMA for conditional approval. Upon conditional approval by FEMA, MAPS will assist the planning team as needed with presentation of the Plan to the Town Select Board and/or Planning Board and continue to work with the Town until final approval and distribution of the Plan is complete, unless extraordinary circumstances prevail.
- MAPS shall provide, at its office, all supplies and space necessary to complete the Town’s Hazard Mitigation Plan.
- After final approval is received from FEMA, MAPS will provide the Town with one copy of the Plan containing all signed documents, approvals and GIS maps along with a CD containing these same documents in digital form, for distribution by the Town as it sees fit. Additional copies of the Plan will be distributed by MAPS to collaborating agencies including, but not limited to, NH Homeland Security (HSEM) and FEMA.
- MAPS will provide Plan maintenance assistance on an annual basis leading up to the next five-year Plan update at no cost to the Town.

THE TOWN’S RESPONSIBILITIES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

- The Town shall insure that the planning team includes members who are able to support the planning process by identifying available community resources including people who will have access to and can provide pertinent data. The planning team should include, but not be limited to, such community members as the local Emergency Management Director, the Fire and Police Chiefs, representatives from the relative federal and state organizations, other local officials, property owners, and relevant businesses or organizations.
- The Town shall determine a lead contact to work with Mapping and Planning Solutions. This contact shall 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. In addition, this contact shall assist Mapping and Planning Solutions with organizing public meetings to develop the plan and offer assistance to Mapping and Planning Solutions in developing the work program which will produce the Plan.
- The Town shall gain the support of stakeholders for the recommendations found within the Plan.
- The Town shall provide public access for all meetings and provide public notice at the start of the planning process and at the time of adoption, as required by FEMA.
- The proposed Plan shall be submitted to the Town Select Board and/or Planning Board for consideration and adoption.
- After adoption and final approval from FEMA is received, the Town will:
 - *Distribute copies of the Plan as it sees fit throughout the local community.*
 - *Develop a team to monitor and work toward plan implementation.*
 - *Publicize the Plan to the Town and insure community awareness.*
 - *Urge the Planning Board to incorporate priority projects into the community’s Capital Improvement Plan (if available).*
 - *Integrate mitigation action items and priorities from the Plan into other town plans.*

Terms

- **Fees and Payment Schedule:** The contract price is limited to \$5,000. The payment procedure is as follows: MAPS will invoice the Town, the Town will forward the MAPS invoice along with an Invoice from the Town on Town letterhead to HSEM, HSEM will pay the Town, and the Town will pay MAPS for each occasion outlined below. No out-of-pocket money is required from the Town.
 - 1. Initial payment upon signing of this contract and receipt of first invoice\$2,400
 - 2. Second payment upon Plan submittal to FEMA for Conditional Approval and receipt of second invoice\$2,400
 - 3. Final payment upon project completion and receipt of final Plan copy and receipt of third invoice \$200

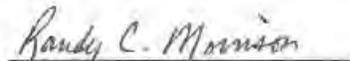
Total Fees..... \$5,000

- **Required Matching Funds:** The Town of Wentworth will be responsible to provide and document any and all resources to be used to meet the FEMA required matching funds. Matching funds are the responsibility of the Town of Wentworth, not MAPS. Mapping and Planning Solutions will however assist the Town with attendance tracking by asking meeting attendees to “sign in” at all meetings and to “log” any time spent outside of the meetings working on this project. MAPS will provide the Town with final attendance records in spreadsheet form at project’s end for the Town to use in its match fulfillment.
- **Project Period:** This project shall begin upon signing this Agreement by both parties and continue through September 9, 2013, at which time the planning process should be complete. The project period may be extended by mutual written Agreement between the Town and MAPS. The actual project end date is dependent upon timely adoptions and approvals which are outside of the control of Mapping and Planning Solutions and the Town in general.
- **Ownership of Material:** All maps, reports, documents and other materials produced during the project period shall be owned by the Town; each party may keep file copies of any generated work. MAPS shall have the right to use work products collected during the planning process; however, MAPS shall not use any data in such a way as to reveal personal or public information about individuals or groups which could reasonably be considered confidential.
- **Termination:** This Agreement may be terminated if both parties agree in writing. In the event of termination, MAPS shall forward all information prepared to date to the Town. MAPS shall be entitled to recover its costs for any work that was completed.
- **Limit of Liability:** MAPS agrees to perform all work in a diligent and efficient manner according to the terms of this Agreement. MAPS' responsibilities under this Agreement depend upon the cooperation of the Town of Wentworth. MAPS and its employees, if any, shall not be liable for opinions rendered, advice, or errors resulting from the quality of data that is supplied. Adoption of the Plan by the Town and final approval of the Plan by FEMA, relieve MAPS of content liability.
- **Amendments:** Changes, alterations or additions to this Agreement may be made if agreed to in writing between both the Town of Wentworth and Mapping and Planning Solutions.

➤ Contacts:	<p><u>Mapping and Planning Solutions</u> June Garneau Mapping and Planning Solutions P.O. Box 283, 91 Cherry Mountain Place Twin Mountain, NH 03595-0283 jgarneau@mappingandplanning.com (603) 846-5720; (603) 991-9664</p>	<p><u>Town of Wentworth</u> Jeffrey Ames Fire Chief & EMD P.O. Box 10 Wentworth, NH 03282 wentworth2@roadrunner.com (603) 764-9992</p>
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SIGNATURE BELOW INDICATES ACCEPTANCE OF AND AGREEMENT TO DETAILS OUTLINED IN THIS AGREEMENT

FOR THE TOWN OF WENTWORTH, NH


 Signature
 Select Board

11-20-12
 Date

FOR MAPPING AND PLANNING SOLUTIONS


 Signature
 June Garneau, Owner

November 14, 2012
 Date

Signature is a scanned facsimile; original signatures are on file.

B. Conditional Approval Letter from FEMA

Wentworth, NH Approval Pending Adoption

Hilliard, Marilyn <Marilyn.Hilliard@fema.dhs.gov>

Sent: Mon 11/17/2014 3:54 PM

To: Steve.davis@timken.com; jfredbones@yahoo.com; jgarneau@mappingandplanning.com

Cc: elizabethaminor@yahoo.com; Moore, Parker; NH MIT Plans; Ndikum-Nyada, Brigitte; Johnson, Nan; Lavallee, Denise

Congratulations!

FEMA Region I has completed its review of the Wentworth, NH Multi-Hazard Mitigation Plan and found it approvable pending adoption. With this approval, the jurisdiction meets the local mitigation planning requirements under 44 CFR 201 **pending FEMA's receipt of electronic copies of the adoption documentation and the final plan**. These items should be provided to your state's mitigation planning point of contact who will ensure they are forwarded to FEMA. Acceptable electronic formats include Word or PDF files and must be submitted to us via email at fema-r1-mitigationplans@fema.dhs.gov. Upon FEMA's receipt of these documents, a formal letter of approval will be issued, along with the final FEMA Checklist and Assessment.

The FEMA letter of formal approval will confirm the jurisdiction's eligibility to apply for Mitigation grants administered by FEMA and identify related issues affecting eligibility, if any. If the plan is not adopted within one calendar year of FEMA's Approval Pending Adoption, the jurisdiction must update the entire plan and resubmit it for FEMA review. If you have questions or wish to discuss this determination further, please contact me at marilyn.hilliard@fema.gov or 617-956-7536.

Thank you for submitting Wentworth's Multi-Hazard Mitigation Plan and congratulations again on your successful community planning efforts.

marilyn.hilliard@fema.dhs.gov
Mitigation Division, FEMA Region I
99 High St., 6th fl., Boston, MA 02110
617-956-7536 phone
617-956-7574 fax

Signature is a scanned facsimile; original signatures are on file

C. SIGNED CERTIFICATE OF ADOPTION

CERTIFICATE OF ADOPTION

WENTWORTH, NH

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE TOWN OF WENTWORTH, HAZARD MITIGATION PLAN UPDATE 2014

WHEREAS, the Town of Wentworth has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in this plan, resulting in loss of property and life, economic hardship and threats to public health and safety; and

WHEREAS, the Town of Wentworth has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2014 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between November 14, 2012 and May 30, 2013 regarding the development and review of the Hazard Mitigation Plan Update 2014 and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for the Town of Wentworth; and

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

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

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Wentworth;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;

Wentworth, Hazard Mitigation Plan Update Certificate of Adoption, page two

- 3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution;
- 4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by the Emergency Management Director.

Adopted this day, the 23 of December, 2014



Steve Davis
Chairman of the Board of Selectmen



Peter Santom
Member of the Board of Selectmen



David McMullen
Member of the Board of Selectmen



Jeffrey Ames
Emergency Management Director & Fire Chief

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Wentworth on this day, Dec 23, 2014



Notary

10-20-2015

Expiration

12-23-2014

Date

CATHERINE L. STOVER, Notary Public
My Commission Expires October 20, 2015

Signatures are scanned facsimile; original signatures are on file.

D. Final Approval Letter from FEMA

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INSERTION OF FINAL APPROVAL LETTER FROM
FEMA WHEN RECEIVED.

PAGE LEFT INTENTIONALLY BLANK FOR
INSERTION OF FINAL APPROVAL LETTER
(PAGE 2) FROM FEMA WHEN RECEIVED.

Signatures are scanned facsimile; original signatures are on file

E. CWPP Approval Letter from DRED

**Wentworth, NH
A Resolution Approving the
Wentworth Hazard Mitigation Plan Update 2014
As a Community Wildfire Protection Plan**

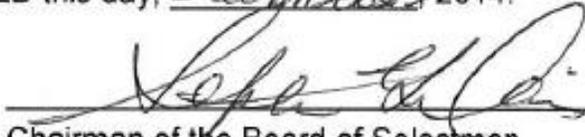
Several public meetings and committee meetings were held between November 14, 2012 and May 30, 2013 regarding the development and review of the Wentworth Hazard Mitigation Plan Update 2014. The Wentworth Hazard Mitigation Plan Update 2014 contains potential future projects to mitigate hazard and wildfire/structure fire damage in the Town of Wentworth.

The Fire Chief along with the Board of Selectmen 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.

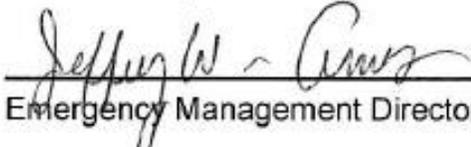
The Board of Selectmen, EMD and the Wentworth Fire Chief approve the Wentworth Hazard Mitigation Plan Update 2014 and understand that with approval by DRED, this Plan will also serve as a Community Wildfire Protection Plan.

For the Town of Wentworth

APPROVED and SIGNED this day, December 23 2014.



Chairman of the Board of Selectmen



Emergency Management Director & Fire Chief

For the Department of Resources and Economic Development

APPROVED and SIGNED this day, _____, 2014.

Forest Ranger – NH Division of Forest and Lands, DRED

APPROVED and SIGNED this day, _____, 2014.

Director – NH Division of Forest and Lands, DRED

Signature is a scanned facsimile; original signatures are on file

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F. Annual Review or Post Hazard Concurrence Forms

YEAR ONE

Check all that apply

- Annual Review & Concurrence - **Year One**: _____ (Date)
- Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)
- Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Wentworth, NH shall execute this page annually by the members of the Town’s governing body and the Town’s designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state local organizations impacted by the Plan posting notices in public places in the Town.

Wentworth, NH
Hazard Mitigation Plan Update

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Chairman of the Select Board

Changes and notes regarding the 2014 Hazard Mitigation Plan Update

Please use reverse side for additional notes 

YEAR TWO

Check all that apply

- Annual Review & Concurrence - **Year Two**: _____ (Date)
- Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)
- Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Wentworth, NH shall execute this page annually by the members of the Town’s governing body and the Town’s designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state local organizations impacted by the Plan posting notices in public places in the Town.

Wentworth, NH
Hazard Mitigation Plan Update

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Chairman of the Select Board

Changes and notes regarding the 2014 Hazard Mitigation Plan Update

Please use reverse side for additional notes 

YEAR THREE

Check all that apply

Annual Review & Concurrence - **Year Three**: _____ (Date)

Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Wentworth, NH shall execute this page annually by the members of the Town’s governing body and the Town’s designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state local organizations impacted by the Plan posting notices in public places in the Town.

Wentworth, NH
Hazard Mitigation Plan Update

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Chairman of the Select Board

Changes and notes regarding the 2014 Hazard Mitigation Plan Update

Please use reverse side for additional notes 

YEAR FOUR

Check all that apply

Annual Review & Concurrence - **Year Four**: _____ (Date)

Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Wentworth, NH shall execute this page annually by the members of the Town’s governing body and the Town’s designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state local organizations impacted by the Plan posting notices in public places in the Town.

Wentworth, NH
Hazard Mitigation Plan Update

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Chairman of the Select Board

Changes and notes regarding the 2014 Hazard Mitigation Plan Update

Please use reverse side for additional notes 

Chapter 12: Appendices

- APPENDIX A: BIBLIOGRAPHY
- APPENDIX B: TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION
 - *Hazard Mitigation Grant Program (HMGP)*
 - *Pre-Disaster Mitigation (PDM)*
 - *Flood Mitigation Assistance (FMA)*
 - *Repetitive Flood Claims (RFC)*
 - *Severe Repetitive Loss (SRL)*
- APPENDIX C: THE EXTENT OF HAZARDS
- APPENDIX D: PRESIDENTIAL DISASTER & EMERGENCY DECLARATIONS
- APPENDIX E: POTENTIAL MITIGATION IDEAS
- APPENDIX F: ACRONYMS
- APPENDIX G: MAP DOCUMENTS
 - *Map 1 – Base Risk Analysis*
 - *Map 2 – Historic Fires & the Wildland Urban Interface (WUI)*
 - *Map 3 – Past & Potential Areas of Concern*
 - *Map 4 – Critical Infrastructure & Key Resources*

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Appendix A: Bibliography

Documents

- **Local Hazard Mitigation Planning Review Guide**, FEMA, October 2011
- **Local Hazard Mitigation Planning Handbook**, FEMA, March 2013
- **Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards**, FEMA, January 2013
- **Hazard Mitigation Unified Guidance**, FEMA, July 12, 2013
- **Wentworth Annual Report, Year Ending December 31, 2013**
- **All Hazards Mitigation Plans**
 - Wentworth Hazard Mitigation Plan, 2009
 - Littleton Hazard Mitigation Plan, 2012
 - Sandwich Hazard Mitigation Plan, 2013
- **NH State Multi-Hazard Mitigation Plan**, 2013
 - <http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf>
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 - <http://www.nhdfi.org/fire-control-and-law-enforcement/fire-statistics.aspx>
- **Disaster Mitigation Act (DMA) of 2000**, Section 101, b1 & b2 and Section 322a
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- **Economic & Labor Market Information Bureau**, NH Employment Security, February 2014; Community Response for Wentworth, Received, 6/18/12, Census 2000 and Revenue Information derived from this site; <http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/wentworth.htm>
- **Photos**: Photos taken by MAPS unless otherwise noted.

Additional Websites

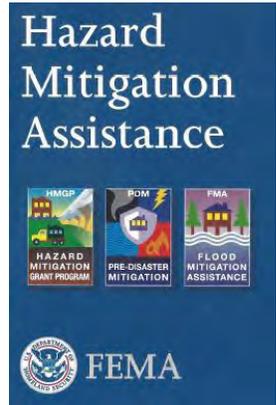
- US Forest Service; <http://www.fs.fed.us>
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- US Department of Agriculture Wildfire Programs: <http://www.wildfireprograms.usda.gov/>
- Firewise; <http://www.firewise.org/>
- NH Homeland Security & Emergency Management; <http://www.nh.gov/safety/divisions/hsem/>
- US Geological Society; <http://water.usgs.gov/ogw/subsidence.html>
- Department Environmental Services; <http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf>
- 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, National Weather Service; <http://www.nws.noaa.gov/glossary/index.php?letter=w>
- NOAA, Storm Prediction Center; <http://www.spc.noaa.gov/faq/tornado/beaufort.html>
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- National Weather Service; <http://www.nws.noaa.gov/om/windchill/>
- Center for Disease Control; <http://www.bt.cdc.gov/disasters/winter/guide.asp>
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- Slate; <http://www.slate.com/id/2092969/>
- Home Pro Inspections; How Radon Enters a House; www.homeprocanada.ca/radon/HP_radon.htm
- NH Office of Energy and Planning; <http://www.nh.gov/oep/planning/programs/fmp/join-nfip.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>
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Appendix B: Technical & Financial Assistance for 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 programs⁹:

- 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 subapplications developed and submitted to them by subapplicants. These subapplications are submitted to FEMA for consideration of funding.

Prospective subapplicants 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.

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.

Table 3: Eligible Activities by Program

Eligible Activities	HMGP	PDM	FMA
1. Mitigation Projects	√	√	√
Property Acquisition and Structure Demolition	√	√	√
Property Acquisition and Structure Relocation	√	√	√
Structure Elevation	√	√	√
Mitigation Reconstruction			√
Dry Floodproofing of Historic Residential Structures	√	√	√
Dry Floodproofing of Non-residential Structures	√	√	√
Minor Localized Flood Reduction Projects	√	√	√
Structural Retrofitting of Existing Buildings	√	√	
Non-structural Retrofitting of Existing Buildings and Facilities	√	√	√
Safe Room Construction	√	√	
Wind Retrofit for One- and Two-Family Residences	√	√	
Infrastructure Retrofit	√	√	√
Soil Stabilization	√	√	√
Wildfire Mitigation	√	√	
Post-Disaster Code Enforcement	√		
Generators	√	√	
5 Percent Initiative Projects	√		
Advance Assistance	√		
2. Hazard Mitigation Planning	√	√	√
3. Management Costs	√	√	√

Eligibility Chart taken from Hazard Mitigation Assistance Unified Guidance, July 12, 2013, FEMA

⁹ Information in Appendix B is taken from the following website and links to specific programs unless otherwise noted; <http://www.fema.gov/government/grant/hma/index.shtm>

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 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/hmgrp/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

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

Up to \$10 million is available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP).

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.

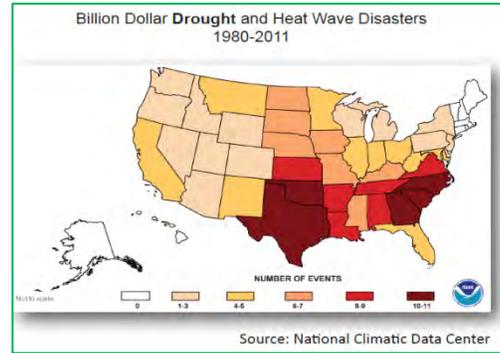
Appendix C: The Extent of Hazards

Hazards indicated with an asterisk * are included in this Plan.

***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.



NEW HAMPSHIRE DROUGHT HISTORY

Dates	Area Affected	Recurrence Interval Yrs	Remarks
1929-1936	Statewide	10 to > 25	Regional
1939-1944	Statewide	10 to > 25	Severe in southeast and moderate elsewhere
1947-1950	Statewide	10 to 25	Moderate
1960-1969	Statewide	> 25	Regional longest recorded continuous spell of less than normal precipitation
2001-2002	Statewide	Not yet determined	Third worst drought on record, exceeded only by the drought of 1956-1966 and 1941-1942

NH DES;
<http://des.nh.gov/organization/divisions/water/dam/drought/documents/hist>

***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 widely determined by the use of two scales, the more commonly used Richter Scale (measures strength or magnitude) and the Mercalli Scale (measures intensity or severity). The chart to the right shows the two scales relative to one another. The Richter Scale measures earthquakes starting at 1 as the lowest with each successive unit being about 10 times stronger and more severe than the previous one.¹⁰

Modified Mercalli Scale		Richter Magnitude Scale
I	Detected only by sensitive instruments	1.5
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	2
III	Felt noticeably indoors, but not always recognized as earthquake; standing autos rock slightly, vibration like passing truck	2.5
IV	Felt indoors by many, outdoors by few, at night some may awaken; dishes, windows, doors disturbed; autos rock noticeably	3
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.5
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.5
VIII	Panel walls thrown out of frames; fall of walls, monuments, chimneys; sand and mud ejected; drivers of autos disturbed	5
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	5.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	6
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	6.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up in air	7

¹⁰ Modified Mercalli Scale/Richter Scale Chart; MO DNR, http://www.dnr.mo.gov/geology/geosrv/geores/richt_mercalli_relation.htm

Four earthquakes occurred in New Hampshire between 1924-1989 having a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia and one near the Quebec border. It is well documented that there are fault lines running throughout New Hampshire, but high magnitude earthquakes have not been frequent in New Hampshire history.

***EROSION, MUDSLIDE & LANDSLIDE**

Erosion is the wearing away of land, such as loss of riverbank, beach, shoreline or dune material. It is measured as the rate of change in the position or displacement of a riverbank or shoreline over a period of time. Short-term erosion typically results from periodic natural events, such as flooding, hurricanes, storm surge and windstorms but may be intensified by human activities. Long-term erosion is a result of multi-year impacts such as repetitive flooding, wave action, sea level rise, sediment loss, subsidence and climate change. Death and injury are not typically associated with erosion; however, it can destroy buildings and infrastructure.¹¹

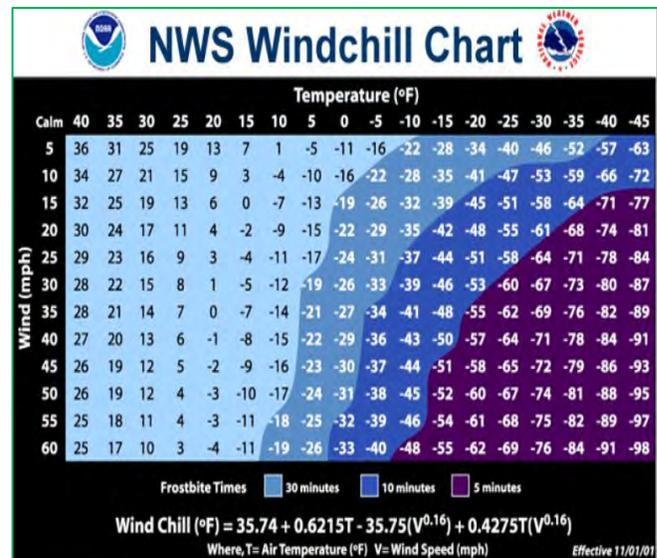
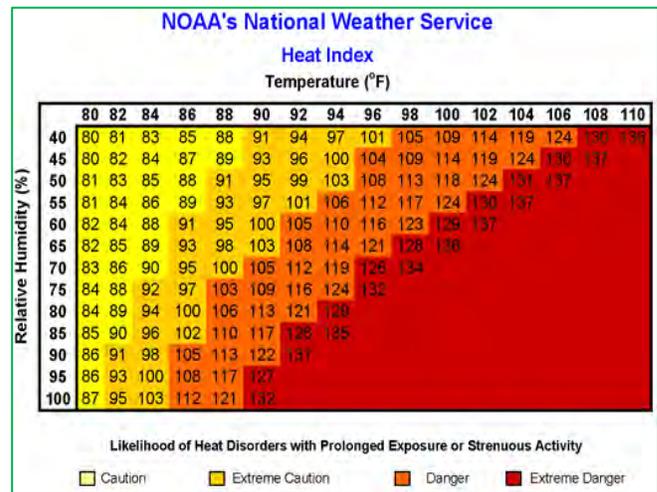
***EXTREME TEMPERATURES**

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 over-exercised 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."¹² The chart above explains the likelihood of heat disorders that may result from high heat.¹³



¹¹Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013

¹² NOAA, Index/Heat Disorders; <http://www.srh.noaa.gov/ssd/html/heatwv.htm>

¹³ NOAA; <http://www.nws.noaa.gov/os/heat/index.shtml>

EXTREME COLD

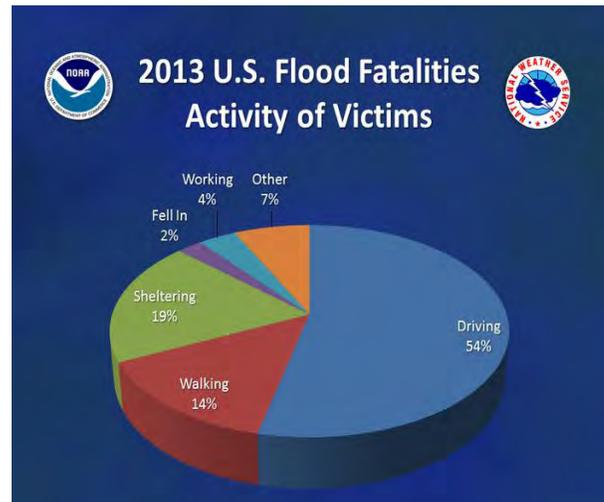
What constitutes extreme cold and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered “extreme cold.” Whenever temperatures drop decidedly below normal and as wind speed increases, heat can leave your 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.¹⁴ The National Weather Service Chart (previous page) shows windchill as a result of wind and temperature.¹⁵

***FLOODING**

GENERAL FLOODING CONDITIONS

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage and water supply contamination. Floods can also disrupt travel routes on roads and bridges.

Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to go; warm temperatures and heavy rains cause rapid snowmelt producing prime conditions for flooding. In addition, 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.



FLOODING (LOCAL, ROAD EROSION)

Heavy rain, rapid snowmelt and stream flooding often cause culverts to be overwhelmed and roads to wash out. Today, with changes in land use, aging roads, designs that are no longer effective and undersized culverts, the risk of flooding is a serious concern. Inadequate and aging storm water drainage systems create local flooding on both asphalt and gravel roads.

FLOODING (RIVERINE)

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. Flooding is often associated with hurricanes, heavy rains, ice jams and rapid snowmelt in the spring.

¹⁴ CDC; <http://www.bt.cdc.gov/disasters/winter/guide.asp> f

¹⁵ National Weather Service; <http://www.nws.noaa.gov/om/windchill/>

FLOODING (DAM FAILURE)

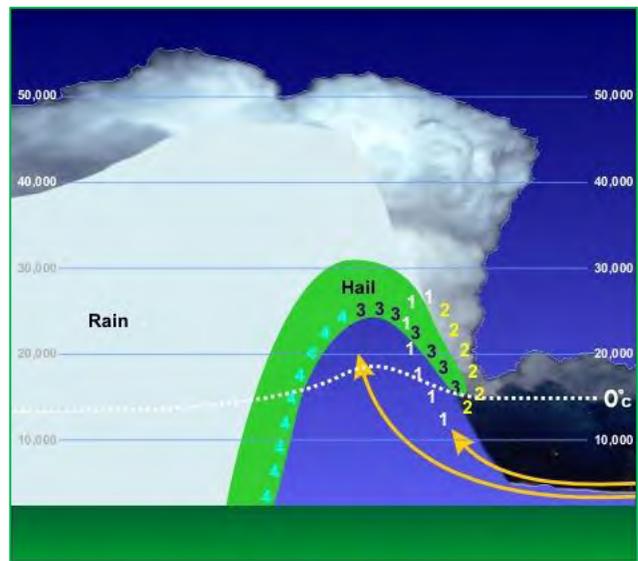
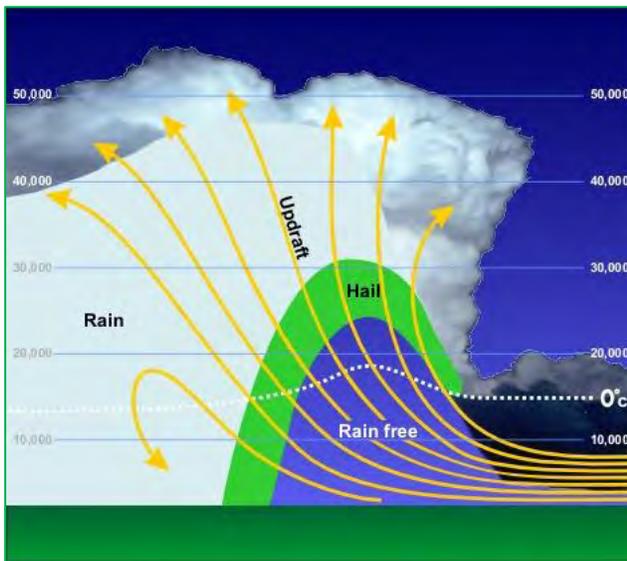
Flooding as a result of dam failure can be small enough to only affect the immediate area of the dam, or large enough to cause catastrophic results to cities, towns and human life that is below the dam. The extent of flooding depends largely on the size of the dam, the amount of water that is being held by the dam, the size of the breach, the amount of water flow from the dam and the amount of human habitation that is downstream.

***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 supercooled water, water at a below-freezing temperature that is not yet ice. The supercooled water droplets freeze into balls of ice and grow to become hailstones. 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. "The largest hailstone recovered in the US fell in Vivian, SD on June 23, 2010 with a diameter of 8 inches and a circumference of 18.62 inches. It weighed 1 lb. 15 oz."¹⁶

Dime/Penny	0.75	
Nickel	0.88	
Quarter	1.00	
Half Dollar	1.25	
Ping Pong	1.50	
Golf Ball	1.75	
Hen Egg	2.00	
Tennis Ball	2.50	
Baseball	2.75	
Tea Cup	3.00	
Grapefruit	4.00	
Softball	4.50	

Details of how hailstones grow are complicated, but the results are irregular balls of ice that can be as large as baseballs. The chart above shows the relative size differences and a common way to "measure" the size of hail based on diameter.¹⁷ The charts below show how hail is formed.¹⁸



¹⁶ NOAA National Severe Storms Laboratory; <https://www.nssl.noaa.gov/education/svrwx101/hail/>

¹⁷ <http://www.pinterest.com/pin/126171227030590678/>

¹⁸ <http://oceanservice.noaa.gov/education/yos/resource/JetStream/tstorms/hail.htm#hail>

***HIGH WIND (WINDSTORM)**

As stated by NOAA (National Oceanic & Atmospheric Administration), 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.¹⁹

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.²⁰

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

¹⁹ NOAA; <http://www.nws.noaa.gov/glossary/index.php?letter=w>

²⁰ NOAA, Storm Prediction Center, <http://www.spc.noaa.gov/faq/tornado/beaufort.html>

***HURRICANE & TROPICAL STORM**

HURRICANES

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.

“The Saffir-Simpson Hurricane Wind Scale” (to the right²¹) is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph.”²²

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.

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	Devastating damage will occur: Well-built frame homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	Catastrophic damage will occur: Well-built frame homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	96-110 mph 83-95 kt 154-177 km/h	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

TROPICAL STORMS

A tropical depression becomes a tropical storm when its maximum sustained winds are between 39-73 mph. Although tropical storms have winds of less than 74 miles per hour, like hurricanes, they can do significant damage. The damage most felt by tropical storms is from the torrential rains they produce which cause rivers and streams to flood and overflow their banks.

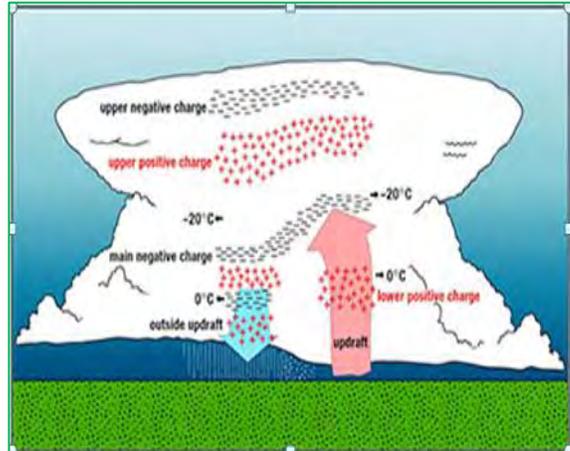
Rainfall from tropical storms has been reported at rates of up to 6 inches per hour; 43 inches of rain in a 24 hour period was reported in Alvin, TX as a result of Tropical Storm Claudette.²³

²¹ National Hurricane Center; <http://www.nhc.noaa.gov/aboutsshws.php>
²² National Hurricane Center, NOAA; <http://www.nhc.noaa.gov/aboutsshws.php>
²³ http://www.wpc.ncep.noaa.gov/research/mcs_web_test_test_files/Page1637.htm

*SEVERE THUNDER & LIGHTNING STORM

As stated by the NOAA National Severe Storms Laboratory (NSSL) "Lightning is a giant spark of electricity in the atmosphere between clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When the opposite charges build up enough, this insulating capacity of the air breaks down and there is a rapid discharge of electricity that we know as lightning. The flash of lightning temporarily equalizes the charged regions in the atmosphere until the opposite charges build up again."²⁴

Thunder, a result of lightning, is created when the "lightning channel heats the air to around 18,000 degrees Fahrenheit..."²⁵ thus causing the rapid expansion of the air and the sounds we hear as thunder. 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.



"A conceptual model shows the electrical charge distribution inside deep convection (thunderstorms), developed by NSSL and university scientists. In the main updraft (in and above the red arrow), there are four main charge regions. In the convective region but outside the out draft (in and above the blue arrow), there are more than four charge regions."- NOAA

Although thunderstorms and their associated lightning can occur any time of year, in New England they are most likely to occur in the summer months and during the late afternoon or early evening hours and may even occur during a winter snowstorm. Trees, tall buildings and mountains are often the targets of lightning because their tops are closer to the cloud; however, lightning is unpredictable and does not always strike the tallest thing in the area.

"Lightning strikes the ground somewhere in the U.S. nearly every day of the year. Thunderstorms and lightning occur most commonly in moist warm climates. Data from the National Lightning Detection Network shows that over the continental U.S. an average of 20,000,000 cloud-to-ground flashes occur every year. Around the world, lightning strikes the ground about 100 times each second, or 8 million times a day.

In general, lightning decreases across the U.S. mainland toward the northwest. Over the entire year, the highest frequency of cloud-to-ground lightning is in Florida between Tampa and Orlando. This is due to the presence, on many days during the year, of a large moisture content in the atmosphere at low levels (below 5,000 feet), as well as high surface temperatures that produce strong sea breezes along the Florida coasts. The western mountains of the U.S. also produce strong upward motions and contribute to frequent cloud-to-ground lightning. There are also high frequencies along the Gulf of Mexico coast, the Atlantic coast and in the southeast United States. US Regions along the Pacific west coast have the least cloud-to-ground lightning."²⁶

²⁴NOAA National Severe Storms Laboratory, <https://www.nssl.noaa.gov/education/svrwx101/lightning>

²⁵Ibid

²⁶Ibid

***SEVERE WINTER SNOW & ICE STORM**

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

SNOW STORMS

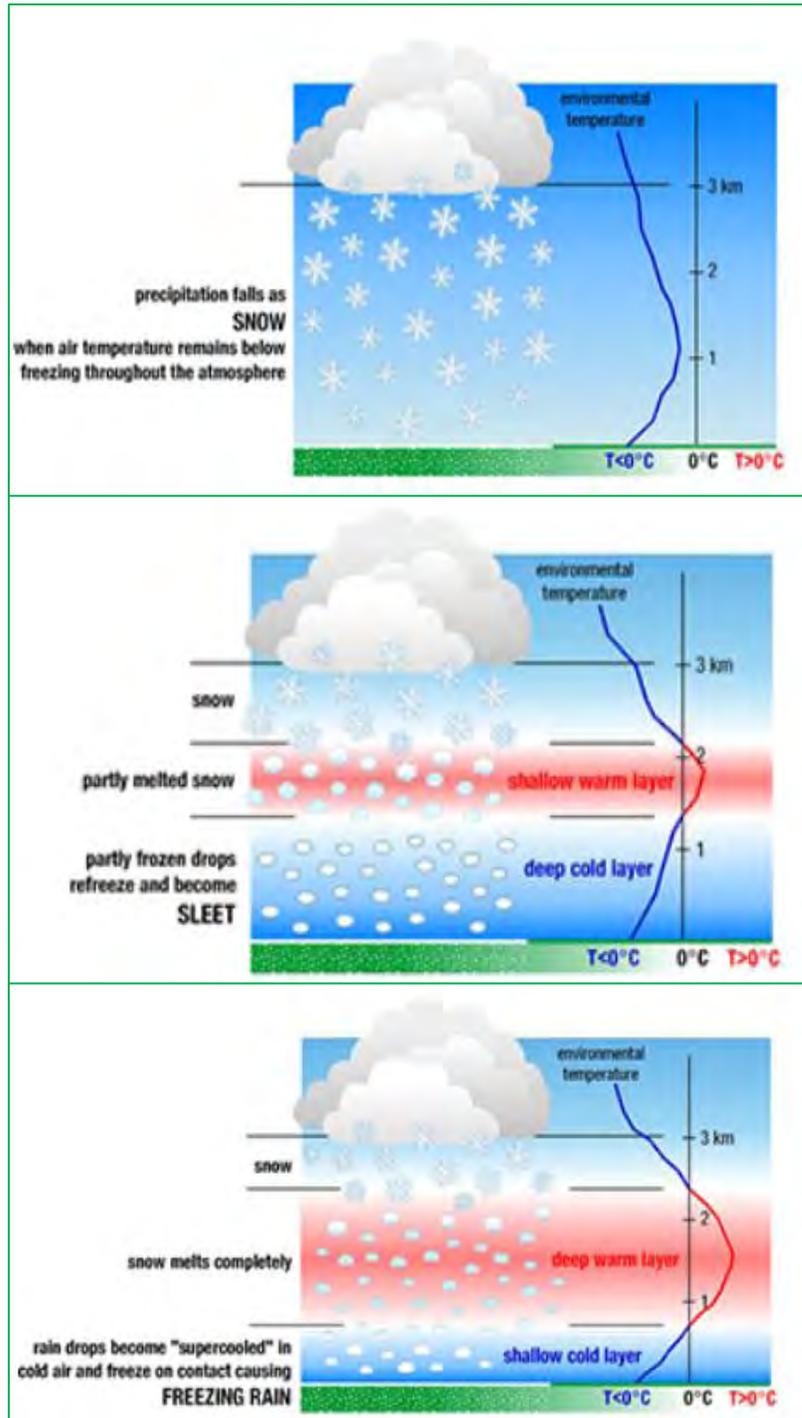
A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.

SLEET

Snowflakes melt as they fall through a small band of warm air and later refreeze when passing through a wider band of cold air. These frozen rain drops then fall to the ground as “sleet”.

FREEZING RAIN & ICE STORMS

Snowflakes melt completely as they fall through a warm band of air then fall through a shallow band of cold air close to the ground to become “supercooled”. These supercooled raindrops instantly freeze upon contact with the ground and anything else that is below 32 degrees Fahrenheit. This freezing creates accumulations of ice on roads, trees, utility lines and other objects resulting in what we think of as an “Ice Storm”. “Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects.”²⁷



*Types of Severe Winter Weather
NOAA – National Severe Storms Laboratory*

²⁷ NOAA, National Severe Storms Laboratory, <https://www.nssl.noaa.gov/education/svrwx101/winter/types/>

The Sperry-Piltz Ice Accumulation Index (SPIA) (below) is designed to help utility companies better prepare for predicated ice storms.²⁸

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) <small>*Revised-October, 2011</small>	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 – 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 – 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 – 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 – 35	
	0.50 – 0.75	15 – 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 – 35	
	0.75 – 1.00	15 – 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

SNOW AVALANCHE

According to the National Snow & Ice Data Center “An avalanche is a rapid flow of snow down a hill or mountainside. Although avalanches can occur on any slope given the right conditions, certain times of the year and certain locations are naturally more dangerous than others. Wintertime, particularly from December to April, is when most avalanches tend to happen. However, avalanche fatalities have been recorded for every month of the year.”²⁹



“All that is necessary for an avalanche is a mass of snow and a slope for it to slide down...A large avalanche in North America might release 230,000 cubic meters (300,000 cubic yards) of snow. That is the equivalent of 20 football fields filled 3 meters (10 feet) deep with snow. However, such large avalanches are often naturally released, when the snowpack becomes unstable and layers of snow begin to fail. Skiers and recreationalists usually trigger smaller, but often more deadly avalanches.”

There are three main parts to an avalanche (see image above). The first and most unstable is the “starting zone”, where the snow can “fracture” and slide. “Typical starting zones are higher up on slopes. However, given the right conditions, snow can fracture at any point on the slope.”³⁰

²⁸ The Weather Channel, <http://www.weather.com/news/weather-winter/rating-ice-storms-damage-sperry-piltz-20131202>

²⁹ Copyright Richard Armstrong, NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>

³⁰ NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>; image credit: Betsy Armstrong

The second part is the “avalanche track”, or the downhill path that the avalanche follows. The avalanche is evident where large swaths of trees are missing or where there are large pile-ups of rock, snow, trees and debris at the bottom of an incline.

The third part of an avalanche is the “runout zone”. The runout zone is where the avalanche has come to a stop and left the largest and highest pile of snow and debris.

“Several factors may affect the likelihood of an avalanche, including weather, temperature, slope steepness, slope orientation (whether the slope is facing north or south), wind direction, terrain, vegetation and general snowpack conditions. Different combinations of these factors can create low, moderate, or extreme avalanche conditions. Some of these conditions, such as temperature and snowpack, can change on a daily or hourly basis.”³¹

When the possibility of an avalanche is evident, an “avalanche advisory” is issued. This preliminary notification warns hikers, skiers, snowmobilers and responders that conditions may be favorable for the development of avalanches. The chart below shows avalanche danger as determined by likelihood, size & distribution.³²

North American Public Avalanche Danger Scale				
Avalanche danger is determined by the likelihood, size and distribution of avalanches.				
Danger Level		Travel Advice	Likelihood of Avalanches	Avalanche Size and Distribution
5 Extreme		Avoid all avalanche terrain.	Natural and human-triggered avalanches certain.	Large to very large avalanches in many areas.
4 High		Very dangerous avalanche conditions. Travel in avalanche terrain <u>not</u> recommended.	Natural avalanches likely; human-triggered avalanches very likely.	Large avalanches in many areas; or very large avalanches in specific areas.
3 Considerable		Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.	Natural avalanches possible; human-triggered avalanches likely.	Small avalanches in many areas; or large avalanches in specific areas; or very large avalanches in isolated areas.
2 Moderate		Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern.	Natural avalanches unlikely; human-triggered avalanches possible.	Small avalanches in specific areas; or large avalanches in isolated areas.
1 Low		Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features.	Natural and human-triggered avalanches unlikely.	Small avalanches in isolated areas or extreme terrain.

Safe backcountry travel requires training and experience. You control your own risk by choosing where, when and how you travel.

³¹ Copyright Richard Armstrong, NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>

³² <http://www.avalanche.ca/cac/bulletins/danger-scale>

***TORNADO & DOWNBURST**

TORNADO

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.

“Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale (F-Scale) to provide estimates of tornado strength based on damage surveys. Since it’s practically impossible to make direct measurements of tornado winds, an estimate of the winds based on damage is the best way to classify a tornado. The new Enhanced Fujita Scale (EF-Scale) addresses some of the limitations identified by meteorologists and engineers since the introduction of the Fujita Scale in 1971. The new scale identifies 28 different free standing structures most affected by tornadoes taking into account construction quality and maintenance. The

range of tornado intensities remains as before, zero to five, with 'EF-0' being the weakest, associated with very little damage and 'EF-5' representing complete destruction, which was the case in Greensburg, Kansas on May 4th, 2007, the first tornado classified as 'EF-5'. The EF scale was adopted on February 1, 2007.”³³ The chart (above), adapted from wunderground.com, shows a comparison of the Fujita Scale to the Enhanced Fujita Scale.

Tornadoes are relatively uncommon natural hazards in New Hampshire; on average, about six tornadoes 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.

EF SCALE	OLD F-SCALE	TYPICAL DAMAGE
EF-0 (65-85mph)	F0 (65-73 mph)	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1 (86-110 mph)	F1 (74-112 mph)	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2 (111-135 mph)	F2 (113-157 mph)	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off
EF-3 (136-165 mph)	F3 (158-206 mph)	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4 (166-200 mph)	F4 (207-260 mph)	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars through and small missiles generated.
EF-5 (>200 mph)	F5 (261-318 mph)	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yards); high-rise buildings have significant structural deformation; incredible phenomena will occur.
EF No rating	F6-F12 (319 mph to speed of sound)	Inconceivable damage. Should a tornado with the maximum wind speed in excess of EF5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage on structures.

³³ Enhance Fujita Scale, http://www.wunderground.com/resources/severe/fujita_scale.asp

DOWNBURST

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.³⁴

***WILDFIRE**

As stated by the National Wildfire Coordinating Group (NWCG), wildfires are designated in seven categories as seen in the top chart to the right.³⁵ For the purpose of statistical analysis, the US Forest Service recognizes the cause of fires according to the bottom chart to the right.³⁶

The definition according to the International Wildland-Urban Interface Code of wildfire is "an uncontrolled fire spreading through vegetative fuels exposing and possibly consuming structures". In addition, the IWUIC goes on to define the wildland urban interface area as "that geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels."³⁷

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 wildfire 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.

Class	Acres Burned
Class A	0 to 25 acres
Class B	26 to 99 acres
Class C	100 to 299 acres
Class D	300 to 999 acres
Class E	1,000 to 4,999 acres
Class F	5,000 acres or more
Class G	
Code	Statistical Cause
1	Lightning
2	Equipment Use
3	Smoking
4	Campfire
5	Debris Burning
6	Railroad
7	Arson
8	Children
9	Miscellaneous

³⁴ NOAA - <http://www.erh.noaa.gov/cae/svrwx/downburst.htm>

³⁵ <http://www.nwcg.gov/pms/pubs/glossary/s.htm>

³⁶ <http://www.fs.fed.us/im/directives/fsh/5109.14/5109.14.20.txt>

³⁷ International Wildland-Urban Interface Code, 2012, International Code Council, Inc.

Appendix D: NH Presidential Disaster & Emergency Declarations

NH Presidential Disaster Declarations (DR) since 1953				
Number	Description	Date of Event	Counties	Description
DR-4139	Severe Storms, Flooding	July 9-10, 2013	Cheshire, Sullivan & Grafton	Presidential Emergency Declaration DR-4139: Severe storms, flooding and landslides during the period of June 26 to July 3, 2013 in Cheshire, Sullivan and southern Grafton Counties.
DR-4105	Severe Winter Storm	February 8, 2013	All Ten NH Counties	Presidential Emergency Declaration DR-4105: Nemo; heavy snow in February 2013.
DR-4095	Hurricane Sandy	October 26- November 8, 2012	Belknap, Carroll, Coos, Grafton & Sullivan	Presidential Disaster Declaration DR-4095: The declaration covers damage to property from the storm that spawned heavy rains, high winds, high tides and flooding over the period of October 26-November 8, 2012.
DR-4065	Severe Storm & Flooding	May 29-31, 2012	Cheshire	Presidential Disaster Declaration DR-4065: Severe Storm and Flood Event May 29-31, 2012 Cheshire County.
DR-4049	Severe Storm & Snowstorm	October 29-30, 2011	Hillsborough & Rockingham	Presidential Disaster Declaration DR-4049: Severe Storm and Snowstorm Event October 29-30, 2011 Hillsborough and Rockingham Counties.
DR-4026	Tropical Storm Irene	August 26- September 6, 2011	Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	Presidential Disaster Declaration DR-4026: Tropical Storm Irene Aug 26th- Sept 6, 2011 Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan Counties.
DR-4006	Severe Storms & Flooding	May 26-30, 2011	Coos & Grafton County	Presidential Disaster Declaration DR-4006: May Flooding Event, May 26th-30th 2011 Coos & Grafton County. (aka: Memorial Day Weekend Storm)
DR-1913	Severe Storms & Flooding	March 14-31, 2010	Hillsborough & Rockingham	Presidential Disaster Declaration DR-1913: Flooding to two NH counties including Hillsborough and Rockingham counties.
DR-1892	Severe Winter Storm, Rain & Flooding	February 23 - March 3, 2010	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Presidential Disaster Declaration: DR-1892: Flood and wind damage to most of southern NH including six counties; 330,000 homes without power; more than \$2 million obligated by June 2010.
DR-1812	Severe Winter Storm & Ice Storm	December 11-23, 2008	All Ten NH Counties	Presidential Declaration DR-1812: Damaging ice storms to entire state including all ten NH counties; fallen trees and large scale power outages; five months after December's ice storm pummeled the region, nearly \$15 million in federal aid had been obligated by May 2009.
DR-1799	Severe Storms & Flooding	September 6-7, 2008	Hillsborough	Presidential Declaration: DR-1799: Severe storms and flooding beginning on September 6-7, 2008.
DR-1787	Severe Storms & Flooding	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	Presidential Declaration DR-1787: Severe storms, tornado and flooding on July 24, 2008.
DR-1782	Severe Storms, Tornado, & Flooding	July 24, 2008	Belknap, Carroll, Merrimack, Strafford & Rockingham	Presidential Declaration DR-1782: Tornado damage to several NH counties.

NH Presidential Disaster Declarations (DR) since 1953

DR-1695	Nor'easter, Severe Storms & Flooding	April 15-23, 2007	All Ten NH Counties	Presidential Disaster Declaration DR-1695: Flood damages; FEMA & SBA obligated more than \$27.9 million in disaster aid following the April nor'easter. (aka: Tax Day Storm)
DR-1643	Severe Storms & Flooding	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	Presidential Disaster Declaration DR-1643: Flooding in most of southern NH, May 12-23, 2006. (aka: Mother's Day Storm)
DR-1610	Severe Storms & Flooding	October 7-18, 2005	Belknap, Cheshire, Grafton, Hillsborough, Merrimack & Sullivan	Presidential Disaster Declaration DR-1610: To date, state and federal disaster assistance has reached more than \$3 million to help residents and business owners in New Hampshire recover from losses resulting from the severe storms and flooding in October.
DR-1489	Severe Storms & Flooding	July 21-August 18, 2003	Cheshire & Sullivan	Presidential Disaster Declaration DR-1489: Floods stemming from persistent rainfall and severe storms that caused damage to public property occurring over the period of July 21 through August 18, 2003.
DR-1305	Tropical Storm Floyd	September 16-18, 1999	Belknap, Cheshire & Grafton	Presidential Disaster Declaration DR-1305: The declaration covers damage to public property from the storm that spawned heavy rains, high winds and flooding over the period of September 16-18.
DR-1231	Severe Storms & Flooding	June 12-July 2, 1998	NA	Presidential Disaster Declaration DR-1231:
DR-1199	Ice Storms	January 7-25, 1998	NA	Presidential Disaster Declaration DR-1199:
DR-1144	Severe Storms/Flooding	October 20-23, 1996	NA	Presidential Disaster Declaration DR-1144:
DR-1077	Storms/Floods	October 20-November 15, 1995	NA	Presidential Disaster Declaration DR-1077:
DR-923	Severe Coastal Storm	October 30-31, 1991	NA	Presidential Disaster Declaration DR-923:
DR-917	Hurricane Bob, Severe Storm	August 18-20, 1991	NA	Presidential Disaster Declaration DR-917:
DR-876	Flooding, Severe Storm	August 7-11, 1990	NA	Presidential Disaster Declaration DR-876:
DR-789	Severe Storms & Flooding	March 30-April 11, 1987	NA	Presidential Disaster Declaration DR-789
DR-771	Severe Storms & Flooding	July 29-August 10, 1986	NA	Presidential Disaster Declaration DR-771:
DR-549	High Winds, Tidal Surge, Coastal Flooding & Snow	February 16, 1978	NA	Presidential Disaster Declaration DR-549: Blizzard of 1978
DR-411	Heavy Rains, Flooding	January 21, 1974	NA	Presidential Disaster Declaration DR-411:
DR-399	Severe Storms & Flooding	July 11, 1973	NA	Presidential Disaster Declaration DR-399:
DR-327	Coastal Storms	March 18, 1972	NA	Presidential Disaster Declaration DR-327:
DR-11	Wildfire	July 2, 1953	NA	Presidential Disaster Declaration DR-11:

Emergency Declarations (EM) since 1953

Number	Description	Date of Event	Counties	Description
EM-3360	Hurricane Sandy	October 26-31, 2012	All Ten	Presidential Emergency Declaration EM-3360: Hurricane Sandy came ashore in NJ and brought high winds, power outages and heavy rain to NH; all ten counties in the State of New Hampshire.
EM-3344	Severe Snow Storm	October 29-30, 2011	All Ten	Presidential Emergency Declaration EM-3344: Severe storm during the period of October 29-30, 2011; all ten counties in the State of New Hampshire. (aka: Snowtober)
EM-3333	Hurricane Irene	August 26-September 6, 2011	All Ten	Presidential Emergency Declaration EM-3333: Emergency Declaration for Tropical Storm Irene for in all ten counties.
EM-3297	Severe Winter Storm	December 11, 2008	All Ten	Presidential Emergency Declaration EM-3297: Severe winter storm beginning on December 11, 2008.
EM-3258	Hurricane Katrina Evacuation	August 29-October 1, 2005	All Ten	Presidential Emergency Declaration EM-3258: Assistance to evacuees from the area struck by Hurricane Katrina and to provide emergency assistance to those areas beginning on August 29, 2005 and continuing; The President's action makes Federal funding available to the State and all 10 counties of the State of New Hampshire.
EM-3211	Snow	March 11-12, 2005	Carroll, Cheshire, Hillsborough, Rockingham & Sullivan	Presidential Emergency Declaration EM-3211: March snowstorm; more than \$2 million has been approved to help pay for costs of the snow removal; Total aid for the March storm is \$2,112,182.01 (Carroll: \$73,964.57; Cheshire: \$118,902.51; Hillsborough: \$710,836; Rockingham: \$445,888.99; Sullivan: \$65,088.53; State of NH: \$697,501.41)
EM-3208	Snow	February 10-11, 2005	Carroll, Cheshire, Coos, Grafton & Sullivan	Presidential Emergency Declaration EM-3208: FEMA had obligated more than \$1 million by March 2005 to help pay for costs of the heavy snow and high winds; Total aid for the February storm was \$1,121,727.20 (Carroll: \$91,832.72; Cheshire: \$11,0021.18; Coos: \$11,6508.10; Grafton: \$213,539.52; Sullivan: \$68,288.90; State of NH: \$521,536.78) EM 3208-002: The Federal Emergency Management Agency (FEMA) had obligated more than \$6.5 million to reimburse state and local governments in New Hampshire for costs incurred in three snow storms that hit the state earlier this year, according to disaster recovery officials. Total aid for all three storms was \$6,892,023.87 (January: \$3,658,114.66; February: \$1,121,727.20; March: \$2,113,182.01)
EM-3207	Snow	January, 22-23, 2005	Belknap, Carroll, Cheshire, Grafton, Hillsborough, Rockingham, Merrimack, Strafford & Sullivan	Presidential Emergency Declaration EM-3207: JANUARY STORM DAMAGE: More than \$3.5 million had been approved to help pay for costs of the heavy snow and high winds; Total aid for the January storm was \$3,658,114.66 (Belknap: \$125,668.09; Carroll: \$52,864.23; Cheshire: \$134,830.95; Grafton: \$137,118.71; Hillsborough: \$848,606.68; Merrimack: \$315,936.55; Rockingham: \$679,628.10; Strafford: \$207,198.96; Sullivan: \$48,835.80; State of NH: \$1,107,426.59)

NH Presidential Disaster Declarations (DR) since 1953				
EM-3193	Snow	December 6-7, 2003	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan	Presidential Emergency Declaration EM-3193: The declaration covers jurisdictions with record and near-record snowfall that occurred over the period of December 6-7, 2003
EM-3177	Snowstorm	February 17-18, 2003	Cheshire, Hillsborough, Merrimack, Rockingham & Strafford	Presidential Emergency Declaration EM-3177: Declaration covers jurisdictions with record and near-record snowfall from the snowstorm that occurred February 17-18, 2003
EM-3166	Snowstorm	March 5-7, 2001	Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Strafford	Presidential Emergency Declaration EM-3166: Declaration covers jurisdictions with record and near-record snowfall from the late winter storm that occurred March 2001
EM-3101	High Winds & Record Snowfall	March 13-17, 1994	NA	Presidential Emergency Declaration EM-3101:
EM-3073	Flooding	March 15, 1979	NA	Presidential Emergency Declaration EM-3073:

Source:

Disaster Declarations for New Hampshire

http://www.fema.gov/disasters/grid/state-tribal-government/33?field_disaster_type_term_tid_1=All

Appendix E: Potential Mitigation Ideas³⁸

Drought

- D1 Assess Vulnerability to Drought Risk
- D2 Monitoring Drought Conditions
- D3 Monitor Water Supply
- D4 Plan for Drought
- D5 Require Water Conservation during Drought Conditions
- D6 Prevent Overgrazing
- D7 Retrofit Water Supply Systems
- D8 Enhance Landscaping & Design Measures
- D9 Educate Residents on Water Saving Techniques
- D10 Educate Farmers on Soil & Water Conservation Practices
- D11 Purchase Crop Insurance

Earthquake

- EQ1.... Adopt & Enforce Building Codes
- EQ2.... Incorporate Earthquake Mitigation into Local Planning
- EQ3.... Map & Assess Community Vulnerability to Seismic Hazards
- EQ4.... Conduct Inspections of Building Safety
- EQ5.... Protect Critical Facilities & Infrastructure
- EQ6.... Implement Structural Mitigation Techniques
- EQ7.... Increase Earthquake Risk Awareness
- EQ8.... Conduct Outreach to Builders, Architects, Engineers and Inspectors
- EQ9.... Provide Information on Structural & Non-Structural Retrofitting

Erosion

- ER1.... Map & Assess Vulnerability to Erosion
- ER2.... Manage Development in Erosion Hazard Areas
- ER3.... Promote or Require Site & Building Design Standards to Minimize Erosion Risk
- ER4.... Remove Existing Buildings & Infrastructure from Erosion Hazard Areas
- ER5.... Stabilize Erosion Hazard Areas
- ER6.... Increase Awareness of Erosion Hazards

Extreme Temperatures

- ET1 Reduce Urban Heat Island Effect
- ET2 Increase Awareness of Extreme Temperature Risk & Safety
- ET3 Assist Vulnerable Populations
- ET4 Educate Property Owners about Freezing Pipes

Hailstorm

- HA1 Locate Safe Rooms to Minimize Damage
- HA2 Protect Buildings from Hail Damage
- HA3 Increase Hail Risk Awareness

Landslide

- LS1.... Map & Assess Vulnerability to Landslides
- LS2.... Manage Development in Landslide Hazard Areas
- LS3.... Prevent Impacts to Roadways
- LS4 Remove Existing Buildings & Infrastructure from Landslide

Lightning

- L1..... Protect Critical Facilities
- L2..... Conduct Lightning Awareness Programs

Flood

- FT1 Incorporate Flood Mitigation in Local Planning
- FT2 Form Partnerships to Support Floodplain Management
- FT3 Limit or Restrict Development in Floodplain Areas
- FT4 Adopt & Enforce Building Codes and Development Standards
- FT5 Improve Stormwater Management Planning
- FT6 Adopt Policies to Reduce Stormwater Runoff
- FT7 Improve Flood Risk Assessment
- FT8 Join or Improve Compliance with NFIP
- FT9 Manage the Floodplain beyond Minimum Requirements
- FT10 .. Participate in the CRS
- FT11 .. Establish Local Funding Mechanism for Flood Mitigation
- FT12 .. Remove Existing Structures from Flood Hazard Areas
- FT13 .. Improve Stormwater Drainage System Capacity
- FT14 .. Conduct Regular Maintenance for Drainage Systems & Flood Control Structures
- FT15 .. Elevate or Retrofit Structures & Utilities
- FT16 .. Floodproof Residential & Non-Residential Structures
- FT17 .. Protect Infrastructure
- FT18 .. Protect Critical Facilities
- FT19 .. Construct Flood Control Measures
- FT20 .. Protect & Restore Natural Flood Mitigation Features
- FT21 .. Preserve Floodplains as Open Space
- FT22 .. Increase Awareness of Flood Risk & Safety
- FT23 .. Educate Property Owners about Flood Mitigation Techniques

Severe Wind

- SW1 ... Adopt & Enforce Building Codes
- SW2... Promote or Require Site & Building Design Standards to Minimize Wind Damage
- SW3 ... Assess Vulnerability to Severe Wind
- SW4... Protect Power Lines & Infrastructure
- SW5... Retrofit Residential Buildings
- SW6... Retrofit Public Buildings & Critical Facilities
- SW7... Increase Severe Wind Awareness

Severe Winter Weather

- WW1.. Adopt & Enforce Building Codes
- WW2.. Protect Buildings & Infrastructure
- WW3.. Protect Power Lines
- WW4.. Reduce Impacts to Roadways
- WW5.. Conduct Winter Weather Risk Awareness Activities
- WW6.. Assist Vulnerable Populations

Tornado

- T1 Encourage Construction of Safe Rooms
- T2 Require Wind-Resistant Building Techniques
- T2 Conduct Tornado Awareness Activities

³⁸ Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013

Wildfire

- WF1 ... Map & Assess Vulnerability to Wildfire
- WF2 ... Incorporate Wildfire Mitigation in the Comprehensive Plan
- WF3 ... Reduce Risk through Land Use Planning
- WF4 ... Develop a Wildland Urban Interface Code
- WF5 ... Require or Encourage Fire-Resistant Construction Techniques
- WF6 ... Retrofit At-Risk Structure with Ignition-Resistant Materials
- WF7 ... Create Defensible Space around Structures & Infrastructure
- WF8 ... Conduct Maintenance to Reduce Risk
- WF9 ... Implement a Fuels Management Program
- WF10 . Participate in the Firewise Program
- WF11 . Increase Wildfire Awareness
- WF12 . Educate Property Owners about Wildfire Mitigation Techniques

Multi-Hazards

- MU1 ... Assess Community Risk
- MU2 ... Map Community Risk
- MU3 ... Prevent Development in Hazard Areas
- MU4 ... Adopt Regulations in Hazard Areas
- MU5 ... Limit Density in Hazard Areas
- MU6 ... Integrate Mitigation into Local Planning
- MU7 ... Strengthen Land Use Regulations
- MU8 ... Adopt & Enforce Building Codes
- MU9 ... Create Local Mechanisms for Hazard Mitigation
- MU10 . Incentivize Hazard Mitigation
- MU11 . Monitor Mitigation Plan Implementation
- MU12 . Protect Structures
- MU13 . Protect Infrastructure & Critical Facilities
- MU14 . Increase Hazard Education & Risk Awareness
- MU15 . Improve Household Disaster Preparedness
- MU16 . Promote Private Mitigation Efforts

Appendix F: Acronyms

**Hazard Mitigation Planning
List of Acronyms**

ACS.....	American Community Survey (Census)
BFE.....	Base Flood Elevation
BOCA.....	Building Officials and Code Administrators International
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 Agency
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
NCRC&D.....	North Country Resource Conservation & Development Council
NOAA.....	National Oceanic and Atmospheric Association
NSSL.....	National Severe Storms Laboratory (NOAA)
MAPS.....	Mapping and Planning Solutions
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

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Appendix G: Map Documents

The following 11" x 17" maps are included in hard copy plans:

Map 1 – Base Risk Analysis

Map 2 – Historic Wildfires & Wildland Urban Interface

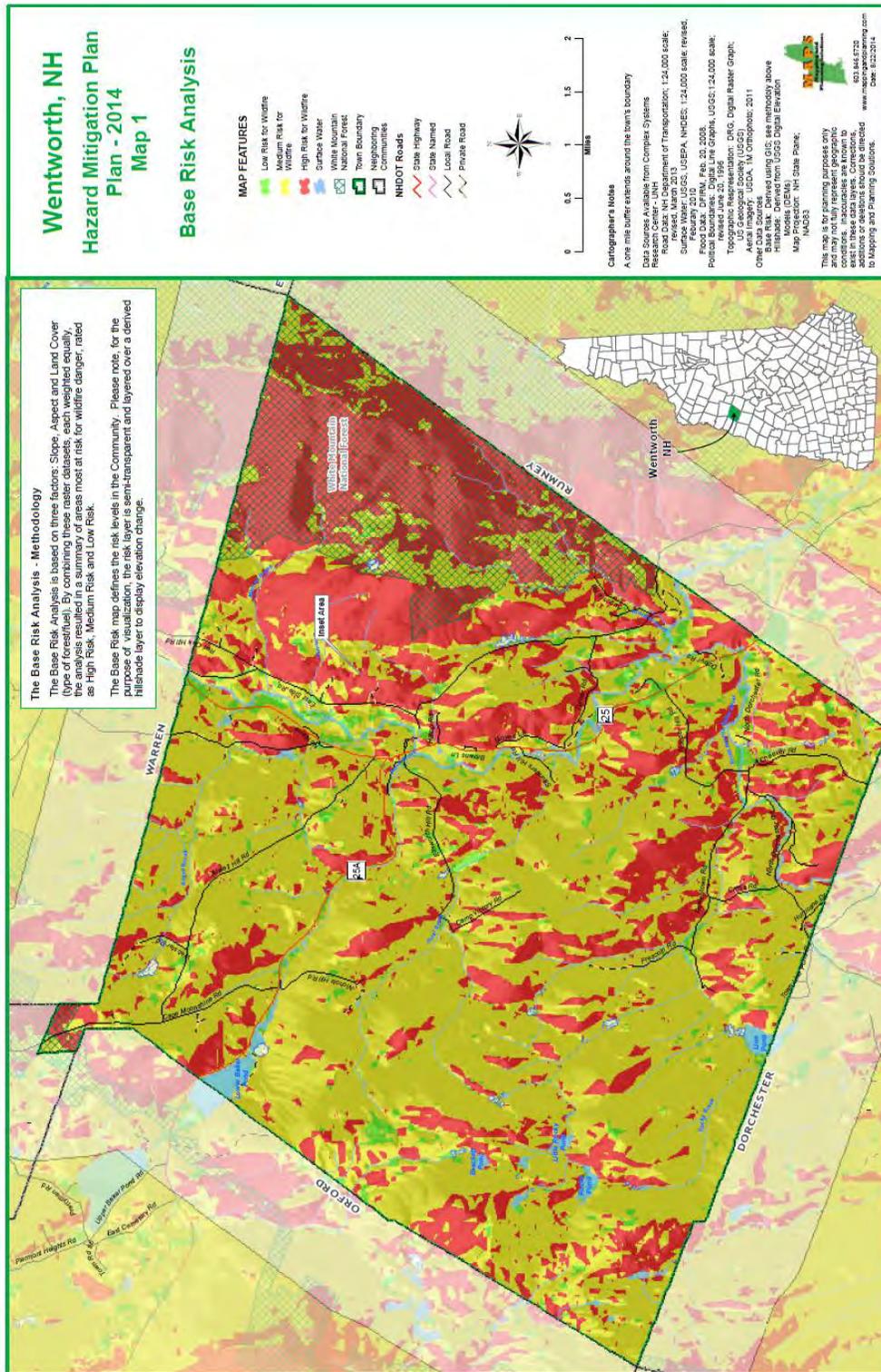
Map 3 – Past & Potential Areas of Concern

Map 4 – Critical Infrastructure & Key Resources

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MAP 1 – BASE RISK ANALYSIS

To be replaced with 11" x 17" map in final hard copy.

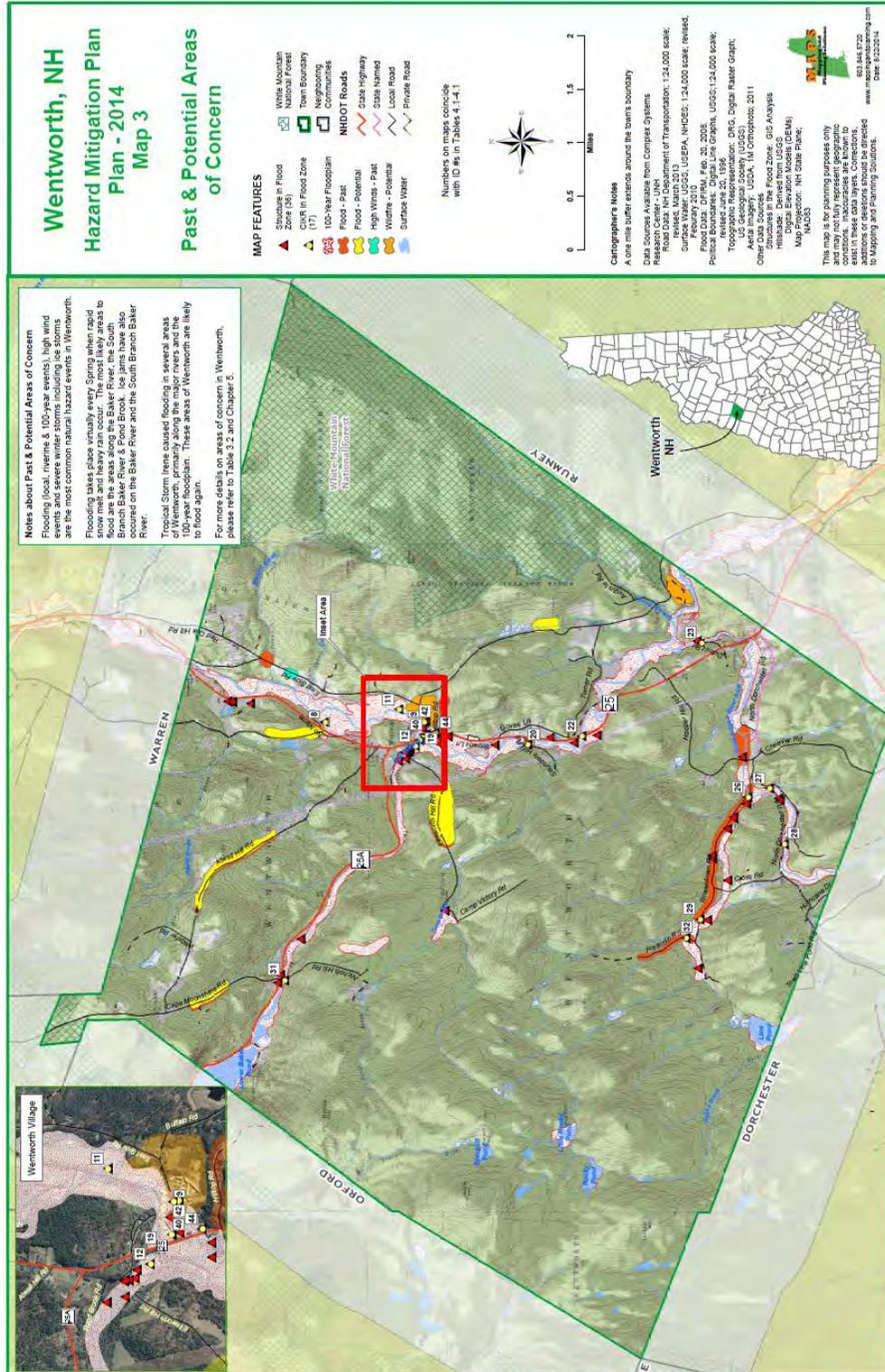


PLACE HOLDER FOR MAP 1

PLACE HOLDER FOR MAP 2

MAP 3 – PAST & POTENTIAL AREAS OF CONCERN

To be replaced with 11" x 17" map in final hard copy.



PLACE HOLDER FOR MAP 3

PLACE HOLDER FOR MAP 4

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*Wentworth Flooding, Tropical Storm Irene
Photo Credit: Town of Wentworth*

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