

Enfield

Hazard Mitigation Plan Update 2022



This plan integrates the following:

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

**March 4, 2022
Final for ADOPTION**

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

**By
The Enfield 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 Photo: Mascoma Lake, The Town of Enfield

Photo Credit: <https://www.enfield.nh.us/home/slideshows/home-slideshow>

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Acknowledgments

This plan integrates elements to qualify it as a Community Wildfire Protection Plan (CWPP), according to the US Forest Service and the NH Department of Natural & Cultural Resources (DNCR). NH Homeland Security & Emergency Management (HSEM) provided grant funding for this plan. The following organizations have contributed invaluable assistance and support for this project:

- NH Homeland Security & Emergency Management (HSEM)
- Federal Emergency Management Agency (FEMA)
- NH Bureau of Economic Affairs (BEA/OSI)
- Mapping and Planning Solutions (MAPS)
- NH Forests & Lands (DNCR)

**This plan is an update to the most recent Enfield Hazard Mitigation Plan, approved in 2015.
This plan was funded under the Pre-disaster Mitigation Grant Program (PDM18)**

Approval Notification Dates for 2022 Update

Approved Pending Adoption (APA) March 4, 2022
 Jurisdiction Adoption: , 2022
 CWPP Approval: , 2022
***Plan Approval Date (HSEM): , 2022**
 Receipt of FEMA Letter , 2022
 Plan Distribution (MAPS): , 2022
**The start if the next five-year clock*

TOWN OF ENFIELD HAZARD MITIGATION PLANNING TEAM (HMPT)

The Town of Enfield would like to thank the following people for the time and effort spent to complete this plan. The following people have attended meetings and been instrumental in completing this plan:

- Charles Clark..... Enfield Energy Committee
- Diane Heed Enfield Director of Human Services
- James Taylor..... Enfield Public Works Director
- Roy Holland..... Enfield Police Chief & EMD
- Rob Taylor..... Enfield Planning & Zoning Admin.
- Phil Neily Enfield BI & HO (former)
- Ryan Aylesworth Enfield Town Manager (former)
- Scott Johnston..... Enfield Highway Supervisor
- Liam Ehrenzweig Enfield BI & HO
- Jack Wozmak..... Town Manager (Interim)
- Jennifer Gilbert..... NH OSI
- Kayla Henderson NH HSEM (former)
- Paul Hatch NH HSEM
- June Garneau MAPS
- Olin Garneau..... MAPS

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

Acronyms and abbreviations associated with the above list:

Admin. Administrator
 BI Building Inspector
 EMD Emergency Management Director
 HO Health Officer

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Executive Summary

The Enfield Hazard Mitigation Plan Update 2022 was compiled to assist the Town of Enfield in reducing and mitigating future losses from natural, technological or human-caused hazardous events. The plan was developed by the Enfield Hazard Mitigation Planning Team (HMPT), 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 2015 Enfield Hazard Mitigation Plan. To produce an accurate and current planning document, the planning team used the 2015 plan as a foundation, building upon that plan to provide more timely information.

This project was held virtually due to the Covid-19 pandemic. This plan's final writing will be completed during the Covid-19 outbreak; therefore, there are references to the virus, particularly in Chapter 5, Section C, Infectious Diseases.

Mitigation action items for natural hazards are the focus of this plan. However, this plan addresses technological and human-caused hazards in addition to natural hazards, as shown below.

NATURAL HAZARDS

- | | |
|--------------------------|--------------------------------------|
| 1) Severe Winter Weather | 7) Infectious Diseases |
| 2) Inland Flooding | 8) Tropical & Post-Tropical Cyclones |
| 3) Extreme Temperatures | 9) Wildfires |
| 4) High Wind Events | 10) Earthquakes |
| 5) Lightning & Hail | 11) Drought |
| 6) Landslide & Erosion | |

TECHNOLOGICAL HAZARDS

- | | |
|-----------------------------|------------------------|
| 1) Aging Infrastructure | 4) Hazardous Materials |
| 2) Dam Failure | 5) Conflagration |
| 3) Long Term Utility Outage | |

HUMAN-CAUSED HAZARDS

- | | |
|----------------------------|-------------------------|
| 1) Mass Casualty Incidents | 3) Terrorism & Violence |
| 2) Transport Accidents | 4) Cyber Events |

Some hazards listed in the 2018 New Hampshire Hazard Mitigation Plan were not included in this plan as the team felt they were unlikely to occur in Enfield or not applicable. An explanation of why these hazards are excluded from this plan can be seen in Chapter 3, Section A.

This plan also provides a list of Critical Infrastructure & Key Resources (CIKR) categorized as follows: Emergency Response Facilities (ERF), Non-Emergency Response Facilities (NERF), Facilities & Populations to Protect (FPP), and Potential Resources (PR). Also, this plan addresses the town's involvement in the National Flood Insurance Program (NFIP).

When faced with an array of hazards, some communities can cope with the impact of these hazards. For example, although severe winter weather is often a common hazard in New Hampshire, most New Hampshire communities handle two to three-foot snowstorms with little or no disruption of services. On the other hand, an unexpected ice storm can have disastrous effects on a community. Mitigation for sudden storms such as ice storms is difficult to achieve. Establishing warming and cooling centers, creating notification systems, providing public outreach, tree trimming, opening shelters, and perhaps burying overhead power lines are just a few action items that may be put in place.

In summary, finding mitigation action items for every hazard that affects a community can be difficult. With today's economic constraints, cities and towns are less likely to have the financial ability to complete some mitigation action items, such as burying power lines. In preparing this plan, the Enfield HMPT has considered a comprehensive list of mitigation action items that could diminish the impact of hazards and 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:

Enfield Hazard Mitigation Plan Update 2022	the plan or this plan
Enfield	the town or the community
Hazard Mitigation Planning Team.....	the team or HMPT
Hazard Mitigation Plan.....	HMP
Emergency Operations Plan	EOP
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 E: Acronyms

Mission Statement:

To make Enfield 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 Town of Enfield 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 Enfield Hazard Mitigation Plan Update 2022 was prepared following 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 Enfield Hazard Mitigation Planning Team (HMPT) 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 (MAPS). HSEM funded this plan through grants from the Federal Emergency Management Agency (FEMA). 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 the 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 aims to have all New Hampshire communities complete a local hazard mitigation plan to reduce future losses from natural hazards before they occur. HSEM outlined a process whereby communities throughout the state may be eligible for grants and other assistance upon completing this hazard mitigation plan.

The Enfield Hazard Mitigation Plan Update 2022 is a planning tool to reduce future losses from natural, technological 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 emphasis on local mitigation planning. It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition for receiving grants under the Hazard Mitigation Grant Program (HMGP). Local governments must review this plan 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 Enfield, NH.

D. SCOPE OF THE PLAN & FEDERAL & STATE PARTICIPATION

A community's hazard mitigation plan often identifies many 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 on Critical Infrastructure & 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 NH Homeland Security & Emergency Management (HSEM), the United States Department of Agriculture-Forest Service (USDA-FS), the NH Department of Natural & Cultural Resources (DNCR), and the NH Bureau of Economic Affairs (BEA/OSI) as well as routine notification of upcoming meetings to state and federal entities above. Designation as a CWPP may allow a community to gain federal funding for hazardous fuel reduction and other mitigation projects supported by the USDA-FS. By merging the two federal planning processes (hazard and wildfire), duplication is eliminated, and the town has access to a larger pool of resources for pre-disaster planning.

The Healthy Forest Restoration Act (HFRA) of 2003 includes statutory incentives for the US Forest Service to consider local communities as they develop and implement forest management and hazardous fuel reduction projects. However, 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 wildfires and all other hazards but also addresses the minimum requirements for a CWPP:

- ***Collaboration:*** *Local and state government representatives must collaboratively develop a CWPP 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 the 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) and its continued compliance with the program. As part of a 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 (see below). Community officials were urged to contact as many people as possible to participate in the planning process, including residents and officials and residents from surrounding communities. The Town of Enfield understands that natural hazards do not recognize political boundaries.

The team provided excellent public and stakeholder notification. Many interested citizens and stakeholders had the opportunity to become aware of the hazard mitigation planning in Enfield. A press release (see below) was posted on the town's website, in the monthly newsletter, and mentioned at Planning Board meetings. Meeting dates were also posted on the town's calendar (see the following page).

*Mapping and Planning Solutions
105 Union Street, Suite 1
Whitefield, NH 03598*

Press Release

FOR IMMEDIATE RELEASE

Updated: June 18, 2020

Contact: June Garneau
603-837-7122

TOWN OF ENFIELD COMMENCES HAZARD MITIGATION PLANNING

The Emergency Management Director of the Town of Enfield recently met with June Garneau, of Mapping and Planning Solutions and other team members from Enfield, to begin work on the required five-year update to the **2015 Enfield Hazard Mitigation Plan**. As a result of this meeting, Mapping and Planning Solutions is conducting a series of meetings on the Hazard Mitigation Plan over the next few months.

Through this series of public meetings, the team will address issues such as flooding, hurricanes, drought, landslides and wildfires, and determine efforts the town can undertake to mitigate the effects of both natural and human-caused hazards. The team will also examine potential shelter sites and the need for generators at those sites.

By examining critical infrastructure and key resources, along with past hazards, the team will establish priorities for future mitigation projects and steps that can be taken to increase public awareness of hazards in general.

As mandated by the Disaster Mitigation Act of 2000, all municipalities are required to complete a local Hazard Mitigation Plan in order to qualify for Federal Emergency Management Administration funding should a natural disaster occur. The planning processes are made possible by grants from FEMA.

The Hazard Mitigation Planning Team is currently being formed; Enfield citizens and any interested stakeholders are invited to participate. The next meeting is scheduled for **Monday, July 20, 2020 from 1:00-3:00 PM** via the "Zoom". The general public is encouraged to attend all meetings. Interested parties should contact Roy Holland, the Police Chief & Enfield Emergency Management Director, at 632-7501 if they wish to be included in the process. Additional Zoom meetings are scheduled for Monday, August 24th at 6:30 PM and Monday, September 21 at 1:00 PM.

More information on the hazard mitigation planning process is available from June Garneau at Mapping and Planning Solutions, 603-837-7122.

HAZARD MITIGATION POTENTIAL TEAM MEMBERS

FEDERAL

- USDA Forest Service

STATE


- Department of Transportation (DOT)
- Department of Natural & Cultural Resources (DNCR)
- Bureau of Economic Affairs (BEA)

LOCAL

- Select Board Member(s)
- Town Manager/Administrator
- Planning Board Member (s)
- Town Planner
- Police Chief
- Fire Chief
- Emergency Management Director
- Emergency Medical Services
- Education/School
- Recreation Director
- DPW Director or Road Agent
- Water & Waste Management
- Public Utilities
- Dam Operator(s)
- Major Employer(s)

OTHER OR SPECIAL INTEREST

- Land Owners
- Home Owners Association(s)
- Forest Management
- Developers & Builders
- GIS Specialists



TOWN OF

ENFIELD

New Hampshire

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July 2020

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Filter by Type: - Any -

Department/Board/Committee: Department/Board Home Page Administration / Town Manager

Apply

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	1 Old Home Days Committee Meeting - CANCELED 5:30pm	2 Conservation Commission Meeting - CANCELED 7:00pm	3 Enfield Town Offices Closed for 1	4 Transfer Station Closed for the 4 Town Offices & Library Closed
5	6 Board of Selectmen & Budget Committee Joint Meeting 6:00pm	7 Mascoma Lakeside Park Committee Meeting 6:30pm	8 Planning Board Work Session ***CANCELLED*** 7:30pm	9 Cemetery Trustees Meeting 6:00pm	10	11 2020 Town Meeting - Business Meeting 6:00am
12	13 Library Trustees Meeting 5:30pm Municipal Facilities Advisory Committee Meeting 6:30pm	14 Zoning Board of Adjustment 7:00pm	15 Old Home Days Committee Meeting	16	17	18
19	20 Enfield Hazard Mitigation Plan Update Meeting 1:00pm Board of Selectmen Meeting 6:00pm	21 Mascoma Lakeside Park Committee Meeting 6:30pm Trustees of Trust Funds Meeting 5:30pm	22	23 Conservation Commission Meeting 7:00pm Cemetery Trustees Meeting 6:00pm	24 Old Home Days	25
26 Old Home Days	27 Municipal Facilities Advisory Committee Meeting 6:30pm	28 Energy Committee meeting 6:00pm	29	30	31	1

Enfield Hazard Mitigation Plan Update Meeting

Event Date: Monday, July 20, 2020 - 1:00pm

Address

Virtual
United States
See map: [Google Maps](#)

Topic: Enfield Hazard Mitigation Plan Update
Time: Jul 20, 2020 01:00 PM Eastern Time (US and Canada)

Join Zoom Meeting
<https://zoom.us/j/91528996887?pwd=QUZkdM43UEZsVkpVJnhR3hmSUtIQT09>

Meeting ID: 915 2899 6887
Password: 984528


If you have trouble connecting call (603) 837-7122

July						
M	T	W	T	F	S	
		1	2	3	4	
6	7	8	9	10	11	
13	14	15	16	17	18	
20	21	22	23	24	25	
27	28	29	30	31		


Upcoming Meetings

Enfield Hazard Mitigation Plan Update Meeting
July 20, 2020 - 1:00pm

Lastly, the planner sent a monthly calendar to NH EMDs, Police Chiefs, Fire Chiefs, Rangers, and other state, federal and private officials, including stakeholders for the town (an example is shown below).



Upcoming Zoom Meetings
(Highlighted by "Counties" as of November 20, 2020)



Day	Date	Time	Town/Location	Plan Type	HSE/Field Rep	County
Monday	11/23/20	6:00 PM	Dummer Zoom Meeting	EOP	Heidi Lawton	Coos
Tuesday	11/24/20	10:00 AM	Bethlehem Zoom Meeting	HMP	Paul Hatch	Grafton
Tuesday	11/24/20	7:00 PM	Jefferson Zoom Meeting	HMP	N/A	Coos
Tuesday	12/1/20	10:00 AM	New Hampton Zoom Meeting	HMP	Julia Chase	Belknap
Wednesday	12/2/20	1:30 PM	Brentwood Zoom Meeting	HMP	Heidi Lawton	Rockingham
Thursday	12/3/20	1:00 PM	Greenland Zoom Meeting	HMP	Heidi Lawton	Rockingham
Monday	12/7/20	1:00 PM	Enfield Zoom Meeting	HMP	Paul Hatch	Grafton
Tuesday	12/8/20	1:00 PM	Milford Zoom Meeting	HMP	Liz Gilboy	Hillsborough

Team composition can be expected to be impacted in some communities due to lower population and because many people “wear more than one hat”. It is often very challenging to attract citizens to participate in town government - those who do generally hold full-time jobs and work as volunteers in various town positions. Depending on the population, the percentage of interested citizens in a town’s planning processes may be diminished. Due to the availability of jobs and other economic factors, Enfield has a relatively high elderly population and a dwindling number of young people interested in politics.

Enfield had excellent participation in the development of this plan. Along with the Emergency Management Director (EMD)/Police Chief, the Director of Public Works, the Highway Supervisor, and the Health Officer/Building Inspector participated in meetings. The Town Manager, a member of the Planning Board, a member of the Energy Committee, and the Director of Health Services also participated in meetings. Although the general public was informed about the planning meetings, no one from the general public attended Enfield’s meetings. Comments made by all team members were integrated into the narrative discussion and incorporated into the document's essence.

§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.

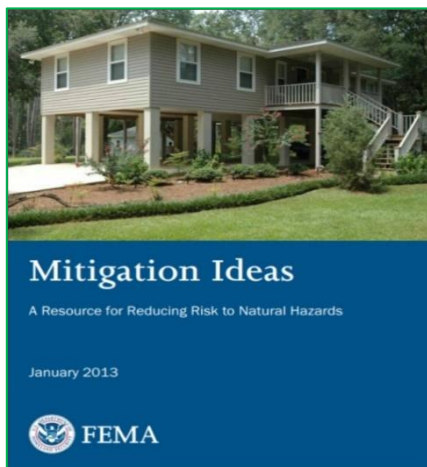
F. INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

The planning process included a complete review of the Enfield Hazard Mitigation Plan of 2015 for updates, development changes, and accomplishments. The team worked with the planner to identify pertinent information from the reviewed documents; this information was then added to the appropriate place in the plan. Also, as noted in the bibliography and footnotes throughout the plan, many other documents were used to create this mitigation plan. Some, but not all, of those plans and documents are listed below:

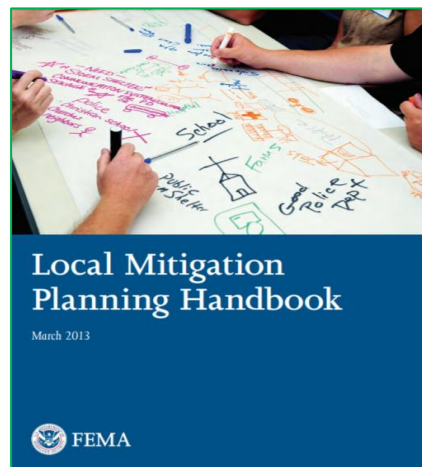
The Enfield Hazard Mitigation Plan of 2015	Compare & Contrast
Enfield Master Plan (2022*)	Community Information
Enfield Annual Reports (2020 & 2021)	Fire Report & Development
Other Hazard Mitigation Plans (Holderness, Woodstock, Bethlehem)	Formats & Mitigation Ideas
The Enfield Ordinance Subdivision Regulations (2017)	New Development Regulations
The Enfield Zoning Ordinance (2020)	Zoning Regulations
Flood Plain Development Ordinance (Part of Zoning)	Floodplain Regulations
Census 2020 Data	Population Data
The NH DRA Summary of Inventory of Valuation MS-1 2020 for Enfield	Structure Evaluation
The Economic & Labor Market Information Bureau Community Profile	Population Trends
Mitigation Ideas, FEMA, January 2013	Mitigation Strategies
The Department of Cultural & Natural Resources (DNCR)	DNCR Fire Report
The NH Bureau of Economic Affairs (BEA/OSI)	Flood Losses
Property Tax Valuation (Department of Revenue Administration)	Property Information

**The Enfield Master Plan is in the process of being updated as of March 1, 2022*

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



<https://www.fema.gov/media-library/assets/documents/30627>



<https://www.fema.gov/media-library/assets/documents/31598>

G. HAZARD MITIGATION GOALS

Before identifying new mitigation action items, the team reviewed and agreed to the goals in the State of New Hampshire Multi-Hazard Mitigation Plan, Update 2018. These goals are detailed below.

OVERARCHING GOALS

The following are the five overarching goals of this plan:

- *Minimize loss and disruption of human life, property, the environment, and the economy due to natural, technological and human-caused hazards through a coordinated and collaborative effort between federal, state, and local authorities to implement appropriate hazard mitigation measures.*
- *Enhance the protection of the general population, citizens, and community guests before, during, and after a hazard event through public education about disaster preparedness and resilience and expanded awareness of the threats and hazards that face the community.*
- *Promote continued comprehensive hazard mitigation planning at local levels to identify, introduce and implement cost-effective hazard mitigation measures.*
- *Address the challenges posed by climate change related to increasing the risk and impacts of the hazards identified within this plan.*
- *Strengthen Continuity of Operations and Continuity of Government at the local level to ensure the continuation of essential services*

NATURAL HAZARD OBJECTIVES

- *Reduce long-term flood risks through assessment, identification, and strategic mitigation of at-risk or vulnerable infrastructure (dams, stream crossings, roadways, coastal levees, etc.).*
- *Minimize illnesses and deaths related to events that present a threat to human and animal health.*
- *Assist communities with plan development, outreach, and public education to reduce the impact of natural disasters.*
- *Ensure mitigation strategies consider the protection and resiliency of natural, historical, and cultural resources.*

TECHNOLOGICAL HAZARD OBJECTIVES


- *Ensure technological hazards are responded to appropriately and mitigate the effect on citizens.*
- *Build upon state and local capabilities to identify and respond to emerging contaminants.*
- *Effectively collaborate between federal, state, and local agencies and private partners, Non-Governmental Organizations (NGOs), and Volunteer Organizations Active in Disaster (VOADs).*
- *Enhance public education of technological hazards to prevent and mitigate hazard impacts on the population.*

- *Ensure hazardous material (HazMat) teams are adequately equipped and trained to respond, contain and mitigate incidents involving technological hazards.*
- *Reduce the possibility of long-term utility outages by planning, training, and exercising on utility failure events.*
- *Lessen the effects of technological hazards on communications infrastructure by building more resilient voice and data systems.*

HUMAN-CAUSED HAZARD OBJECTIVES

- *Ensure that grant-related funding processes allow for reasonable and practical actions at the community and state levels.*
- *Identify Critical Infrastructure & Key Resources (CIKR) risks or vulnerabilities and protect or harden infrastructure against hazards.*
- *Improve the ability to respond and mitigate Cyber Events through increased training, exercising, improved equipment, and utilizing the latest technologies.*
- *Foster collaboration between federal, state, and local agencies on training, exercising, and preparing for mass casualty incidents and terrorism.*
- *Ensure that state and community assets (i.e., hospitals, state agencies, non-profits, universities, nursing homes, prisons, etc.) are prepared for all phases of emergency management, including training, reunification, and exercising.*

Did You Know?



On average,
\$1 spent on
HAZARD MITIGATION
provides the
NATION
approximately
\$4 IN FUTURE
BENEFITS

Money spent on reducing the risk of natural hazards is a wise investment. FEMA administers three grant programs that provide funding for eligible mitigation planning and projects: the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) Program, and the Pre-Disaster Mitigation (PDM) Program.

FEMA E-Brief, April 12, 2017

H. HAZARD MITIGATION PLANNING PROCESS & METHODOLOGY

The planning process consisted of twelve steps; some steps were accomplished independently while other areas were interdependent. Many factors affected the planning process's sequence, 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, technical, and human-caused hazards.



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, orientation, and goals

Step 02: Identify hazards and their risk and probability

Table 3.1 – Hazard Identification & Risk Assessment (HIRA)

Step 03: Profile and list past and potential hazards

Table 3.2 – Historic Hazard Identification

Step 04: Profile, list, and establish risk for Critical Infrastructure & Key Resources (CIKR)

Tables 4.1 to 4.4 – Critical Infrastructure & Key Resources

Step 05: Assess the community's participation in the National Flood Insurance Program (NFIP)

Chapter 3, Section D

Step 06: Prepare an introduction to the community, discuss emergency service capabilities and development trends and review statistical information about the town

Chapter 2, Sections A, B and C & Table 2.1, Town Statistics

Step 07: Review current plans, policies & mutual aid & brainstorm to identify improvements

Table 6.1 – Current Plans, Policies & Mutual Aid

Step 08: Examine the mitigation action items from the last plan

Table 7.1 – Accomplishments since the last Plan

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 an action plan

Table 9.1 – The Mitigation Action Plan

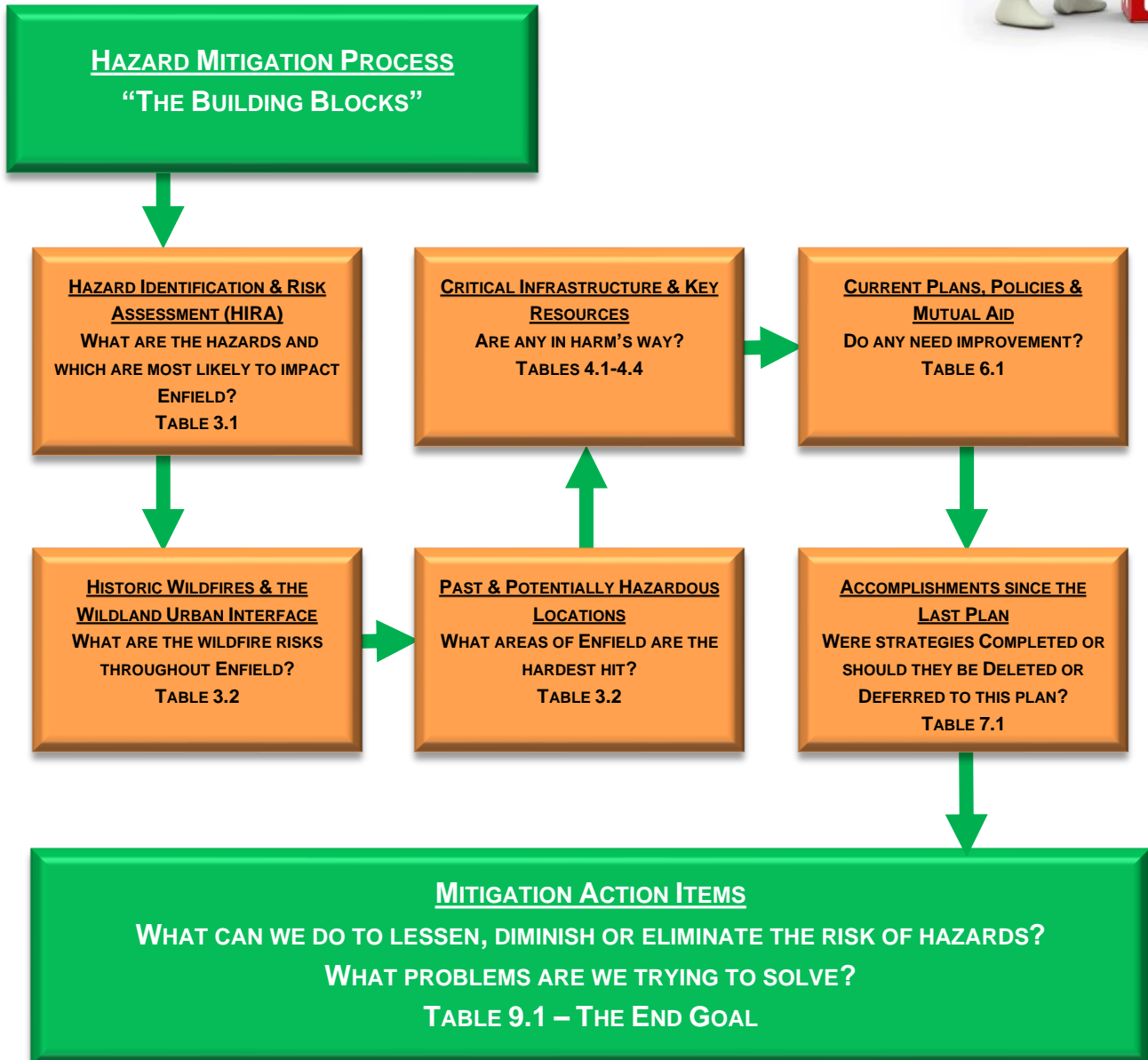
Step 11: Review the plan before submission to HSEM for APA (Approved Pending Adoption)

Step 12: Adopt and monitor the plan

I. HAZARD MITIGATION BUILDING BLOCKS & TABLES

Using a "building block" approach, the base, or foundation, for this mitigation plan was the prior plan. Each completed table had its starting point with the last hazard mitigation plan completed by the community.

Ultimately, the "building blocks" led to the final goal of developing prioritized mitigation "action items" that would lessen or diminish the impact of natural hazards on the town when put into an action plan.



J. NARRATIVE DESCRIPTION OF THE PROCESS

Completion of this new hazard mitigation plan required significant planning preparation. The plan was developed with substantial local, state, and federal coordination. All meetings were geared to accommodate brainstorming, open discussion, and increased awareness of potentially hazardous conditions in the town.

The planning process included a complete review of the 2015 Enfield Hazard Mitigation Plan. Using the 2015 plan as a base, each element of the old plan was examined and revised to reflect changes that had taken place in development and the priorities of the community. In addition, referring to the 2015 plan, strategies from the past were reassessed and improved upon for the future.

The following narrative explains how the 2015 Enfield Hazard Mitigation Plan was used during each stage of the planning process to make revisions that resulted in this plan.

MEETING 1, JUNE 15, 2020

The first virtual meeting of the Enfield Hazard Mitigation Team was held on June 15, 2020. Meeting attendance included Charles Clark (Energy Committee), Diane Heed (Director of Human Services), James Taylor (Public Works Director), Roy Holland (Police Chief & EMD), Rob Taylor (Planning & Zoning Administrator), Phil Neily (Building Inspector & Health Officer), Ryan Aylesworth (Town Manager), Olin Garneau (Mapping and Planning Solutions), and June Garneau (Mapping & Planning Solutions).

To introduce the team to the planning process, the planner reviewed the evolution of hazard mitigation plans, the funding, the 12 Step Process (handout), the collaboration with other agencies, and the Goals (handout). The planner also explained the need to sign in, track time (handout), and provide public notice to encourage community involvement.

Work then began on *Table 2.1, Town Statistics*. Most of the work on this table was completed at this meeting except for a few items that the planner would either determine through GIS or get later. There was some discussion about the seasonal population change in Enfield; however, it was determined that Enfield does not have a significant influx of seasonal tourists.

Next on the Agenda were hazard identification and the completion of *Table 3.1, Hazard Identification & Risk Assessment (HIRA)*. Using the town's last HMP and the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018, the team assessed which hazards could affect the community.

Meeting 1 – June 15, 2020

1) Introduction

- a) Evolution of Hazard Mitigation Plans & Community Wildfire Protection Plans
- b) Reasons for Hazard Mitigation and Update
- c) Community involvement to solicit input on how to mitigate the effects 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 (HSEM, WMNF)

3) Meetings

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

4) Today's Topics

- a) Table 2.1, Town Information
- b) Table 3.1, Hazard Identification & Analysis
- c) Hazard Descriptions
- d) Table 4.1-4.4, Critical Infrastructure & Key Resources
- e) Table 3.2, Historic Hazard Identification (time allowing)

5) Homework

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

6) Future Meetings

- a) _____

After the hazards had been identified, the team then assessed the risk severity and probability by ranking each hazard on a scale of 1-5 (5 being very high or catastrophic) based on the following:

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

The rankings were then calculated to reveal the hazards which pose the most significant risks to the community. Eleven natural hazards, six technological hazards, and four human-caused hazards were identified. After analyzing these hazards in Table 3.1, Severe Winter Weather and Inland Flooding were designated “High Risk” natural hazards for the town.

Having completed Table 3.1, the team started working on descriptions of each hazard and how they could impact the community. To gain more knowledge of the impact of these hazards, the planner asked the team to describe each hazard as it relates explicitly to Enfield. 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 the loss of life?*
- *Are the elderly and functional 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?*
- *What mitigation actions can we take to eliminate the hazards or diminish their impact?*

In addition to bringing more awareness to the hazards, these questions also provided information to analyze their impact on the community. The planner noted that these descriptions would be used in Chapter 5.

With time running out before the hazard descriptions were completed, the planner advised the team that the remaining ones would be completed at the next meeting. The planner thanked the team for their work and assigned “homework” to team members, including requesting that the Public Works Director prepare a list of road/culvert projects that would need to be completed within the next five years. The planner also asked the team to think about Critical Infrastructure & Key Resources (CIKR) and past events that have affected the town. A second virtual meeting was scheduled for Monday, July 20, 2020.

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.

MEETING 2, JULY 20, 2020

Virtual meeting attendance included Charles Clark, Diane Heed, James Taylor, Roy Holland, Rob Taylor, Ryan Aylesworth, Olin Garneau, and June Garneau.

The meeting began with a review of the work done at the previous meeting. The planner reviewed *Table 2.1, Town Statistics*, to ensure that the town data was accurate, no changes were made. The planner then reviewed *Table 3.1, Hazard Identification & Risk Assessment (HIRA)*, to ensure the team felt the hazards were in the correct order for the town. The team felt that the list accurately represented the hazards that affect Enfield.

Next on the agenda was the completion of the hazard descriptions that were started at the previous meeting. While doing the hazard descriptions, development trends were also discussed.

With time running out, the planner reviewed what would occur at the next meeting and thanked the team. The next virtual meeting was set for August 24, 2020, but was later changed to September 21, 2020.

MEETING 3, SEPTEMBER 21, 2020

Virtual meeting attendance included Charles Clark, Diane Heed, James Taylor, Roy Holland, Rob Taylor, Ryan Aylesworth, Scott Johnson (Highway Supervisor), Olin Garneau, and June Garneau.

First, the team began work on *Table 3.2, Historic Hazard Identification*, which lists past and potentially hazardous locations and events. Next, they looked at the hazards listed in the last plan and determined which they would like to see kept in this plan. Next, the team examined the record of Major Disaster and Emergency Declarations that have taken place in recent years.

Next on the agenda were *Tables 4.1–4.4, Critical Infrastructure & Key Resources (CIKR)*. The Emergency Response Facilities, the Non-Emergency Response Facilities, the Facilities & Populations to Protect, and the Potential Resources from the 2015 plan were examined. 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 Critical Infrastructure & Key Resource was analyzed for their “Hazard Risk”. Time ran out before Tables 4.1–4.4 could be completed. The planner explained what would occur at the next meeting, which was set for October 26, 2020, and the meeting was adjourned.

Meeting 2 – July 20, 2020

1) Last Meeting

- a) Reviewed planning process, purpose, funding & collaboration.
- b) Reviewed of community involvement and stakeholders
- c) Worked on Table 2.1, Town Information
- d) Worked Table 3.1, Hazard Identification & Analysis
- e) Worked on Hazard Descriptions (Did not finish)

2) Today's Topics

- a) Review....
 - i) Table 2.1, Town Statistics
 - ii) Table 3.1, Hazard Identification & Analysis
- b) Finish Hazard Descriptions
- c) Work on....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 4.1-4.4, Critical Infrastructure & Key Resources
 - iii) Table 6.1, Current Plans, Policies & Mutual Aid (time allowing)
 - iv) Table 7.1, Accomplishments since the prior Plan (time allowing)

3) Homework

- a) Review materials sent by MAPS
- b) Digital Photos – contributions welcome

4) Future Meetings

- a) Monday, August 24, 2020 @ 6:30 PM
- b) Monday, September 21, 2020 @ 1:00 PM

Meeting 3 – September 21, 2020

1) Last Meeting

- a) Reviewed....
 - i) Table 2.1, Town Statistics
 - ii) Table 3.1, Hazard Identification & Analysis
- b) Worked on....
 - i) Hazard Descriptions

2) Today's Topics

- a) Work on....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 4.1-4.4, Critical Infrastructure & Key Resources
 - iii) Table 6.1, Current Plans, Policies & Mutual Aid (time allowing)
 - iv) Table 7.1, Accomplishments since the prior Plan (time allowing)

3) Homework

- a) Review materials sent by MAPS
- b) Digital Photos – contributions welcome

4) Future Meetings

- a) _____

MEETING 4 – OCTOBER 26, 2020

Virtual meeting attendance included Charles Clark, James Taylor, Roy Holland, Phil Neily, Ryan Aylesworth, Olin Garneau, and June Garneau.

First on the agenda was a review of the last meeting, including *Table 3.2, Historic Hazard Identification*. While reviewing Table 3.2, the planner took the opportunity to explain the Wildland Urban Interface (WUI); 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 wildfires. Enfield noted that the WUI, if determined using the 1,320-foot buffer method, would cover only the area along Class V roadways but that much of the town is forested. Therefore, the entire town was thought to be in the WUI. Mitigation strategies were discussed to protect structures and educate citizens about wildfire risk.

Meeting 4 – October 26, 2020

1) Last Meeting

- a) Worked on....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 4.1-4.4, Critical Infrastructure & Key Resources (did not finish)

2) Today's Topics

- a) Finish....
 - i) Table 4.1-4.4, Critical Infrastructure & Key Resources
- b) Work on....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid (time allowing)
 - ii) Table 7.1, Accomplishments since the prior Plan (time allowing)

3) Homework

- a) Review materials sent by MAPS
- b) Digital Photos – contributions welcome

4) Future Meetings

- a) December 7, 2020 @ 1:00 PM

The team then finished where they had left off on Tables 4.1-4.4. There was considerable talk about the dams in town and if they would affect the town.

The team then began working on *Table 6.1, Current Plans, Policies & Mutual Aid*; like other tables, this table was also pre-populated with information from the 2015 plan. Looking closely at the existing policies from the last plan and current mechanisms that are in place, the team determined if each plan, policy, or mutual aid system should be designated as “No Improvements Needed” or “Improvements Needed” based on the “Key to Effectiveness” found in Chapter 6.

It was explained to the team that those items that needed improvement would become new “Action Items” for this plan and be discussed again and re-prioritized when we got to our final table, *Table 9.1, The Mitigation Action Plan*.

The planner adjourned the meeting and promised to write statements to support the concepts and ideas that were expressed for Table 6.1. The next meeting was scheduled for December 7, 2020, but was later changed to January 28, 2021.

Link to explore:

FEMA Mitigation Ideas

https://www.fema.gov/media-library-data/20130726-1904-25045-0186/fema_mitigation_ideas_final508.pdf

MEETING 5 – JANUARY 28, 2021

Virtual meeting attendance included Charles Clark, James Taylor, Roy Holland, Rob Taylor, Liam Ehrenzweig (Health Officer & Building Inspector), Olin Garneau, and June Garneau.

The meeting began with an overall recap of the work that had already been done. The recap included a brief look at each of the following completed tables:

- *Table 2.1 – Town Statistics*
- *Table 3.1 – Hazard Identification & Risk Assessment (HIRA)*
- *Table 3.2 – Historic Hazard Identification*
- *Tables 4.1-4.4 – Critical Infrastructure & Key Resources*

The planner then took the team through a complete review of Table 6.1 to ensure that the comments and ideas expressed by the team were fully represented. Work on this table resulted in 18 new “Action Items” for this plan, some of which are also in Table 7.1.

Table 7.1, Accomplishments since the Last Plan, also pre-populated with data from the 2015 plan, was the next agenda item. The planner led the team through each strategy to determine which of these was “Completed” should be “Deleted” or should be “Deferred” to this plan as a new mitigation action item. Some of the action items from the 2015 plan had been completed or partially completed by the town. Some were deleted as they were no longer useful or considered emergency preparedness, not mitigation. Still, others were “deferred” for consideration as new “Action Items” for this plan.

To end the meeting, the planner suggested that the team look at a comprehensive list of possible mitigation action items (see Chapter 8, Section A & B, and Appendix F). The planner also encouraged team members to explore the link on the agenda for the FEMA Mitigation Idea booklet to see if any of the strategies in this book would be helpful in Enfield.

The next meeting was scheduled for March 4, 2021.

MEETING 6 – MARCH 4, 2021

Virtual meeting attendance included Charles Clark, James Taylor, Roy Holland, Rob Taylor, Liam Ehrenzweig, Olin Garneau, and June Garneau.

To begin the meeting, the planner walked the team through a complete review of Table 7.1. The planner translated the notes from the last meeting into paragraphs; the planner reviewed each item in Table 7.1 to see if the concepts and ideas of the team remained intact and to verify the accuracy of the information. A few changes were made with this review, leaving five additional items from Table 7.1 (that were not also in Table 6.1) deferred to become new mitigation action items for this plan. Although several strategies from the last plan were determined to be emergency preparedness and not mitigation, the team decided to keep them as reminders to complete these important action items.

Meeting 5 – January 28, 2021

1) Last Meeting

- a) Finished....
 - i) Tables 4.1-4.4, Critical Infrastructure & Key Resources
- b) Worked on....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid (did not finish)

2) Today's Topics

- a) Review....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid
- b) Work on....
 - i) Table 7.1, Accomplishments since the prior Plan

3) Homework

- a) Review materials sent by MAPS
- b) Digital Photos – contributions welcome

4) Future Meetings

- a) _____

In addition to the action items identified in Tables 6.1 and 7.1, the team then reviewed additional potential action items using a comprehensive list of mitigation strategies that were derived from several sources, including the FEMA document “Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards, January 2013” (see Chapter 8, Sections A & B and Appendix F).

Next, the team began work on *Table 8.1, Potential Mitigation Action Items & the STAPLEE*, and *Table 9.1, The Mitigation Action Plan*. The planner explained that these tables were combined for the meeting but would become separate tables in the final plan. Having pre-populated the tables with the action items that had been deferred from Tables 6.1 and 7.1, the team looked carefully at each “Action Item” to assign responsibility, the time frame for completion, the type of funding that would be required, and the estimated cost of the action (see Chapter 9, Section B).

Work on this table included the STAPLEE process, as shown in Chapter 8. Using handouts provided by the planner, the team was able to go through the STAPLEE process for the action items identified. The STAPLEE analysis would then become *Table 8.1, Potential Mitigation Action Items & the STAPLEE*. Most importantly, the STAPLEE process enabled the team to consider the cost-benefit of each action item.

Although most of Tables 8.1 and 9.1 were complete, there were a few action items to discuss at the next meeting, as well as the “ranking” and “prioritizing” of each action item. The planner provided the team with one last handout that would be used during the next meeting, an explanation of the Ranking/Prioritizing (Chapter 9, Section A) method.

The next meeting was scheduled for April 8, 2021.

MEETING 7 – APRIL 8, 2021

Virtual meeting attendance included Charles Clark, James Taylor, Roy Holland, Rob Taylor, Olin Garneau, and June Garneau.

The meeting began where we had left off in Tables 9.1 & 8.1. After the team had considered each strategy forwarded from Tables 6.1 & 7.1, the team considered additional mitigation items, some the planner had suggested from other plans. After much discussion and a careful review, ultimately, the team settled on thirty-two “Mitigation Action Items” that they felt were achievable, which would help to diminish the impact of natural hazards in the future.

After all of the mitigation action items had been determined and the STAPLEE was completed, the team was now ready for the ranking & prioritizing of the action items that had been identified.

Meeting 6 – March 4, 2021

1) Last Meeting

- a) Reviewed....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid
- b) Worked on....
 - i) Table 7.1, Accomplishments since the prior Plan

2) Today's Topics

- a) Review....
 - i) Table 7.1, Accomplishments since the prior Plan
- b) Work on....
 - i) Table 9.1, Mitigation Action Plan
 - ii) STAPLEE

3) Homework

- a) Review materials sent by MAPS
- b) Digital Photos – contributions welcome

4) Future Meetings

- a) _____

Meeting 7 – April 8, 2021

1) Last Meeting

- a) Reviewed....
 - i) Table 7.1, Accomplishments since the prior Plan
- b) Worked on....
 - i) Table 9.1, Mitigation Action Plan (did not finish)
 - ii) STAPLEE (did not finish)

2) Today's Topics

- a) Finish....
 - i) Table 9.1, Mitigation Action Plan
 - ii) STAPLEE
- b) Work on....
 - i) Ranking & Priority

3) Homework

- a) Review materials sent by MAPS
- b) Digital Photos – contributions welcome

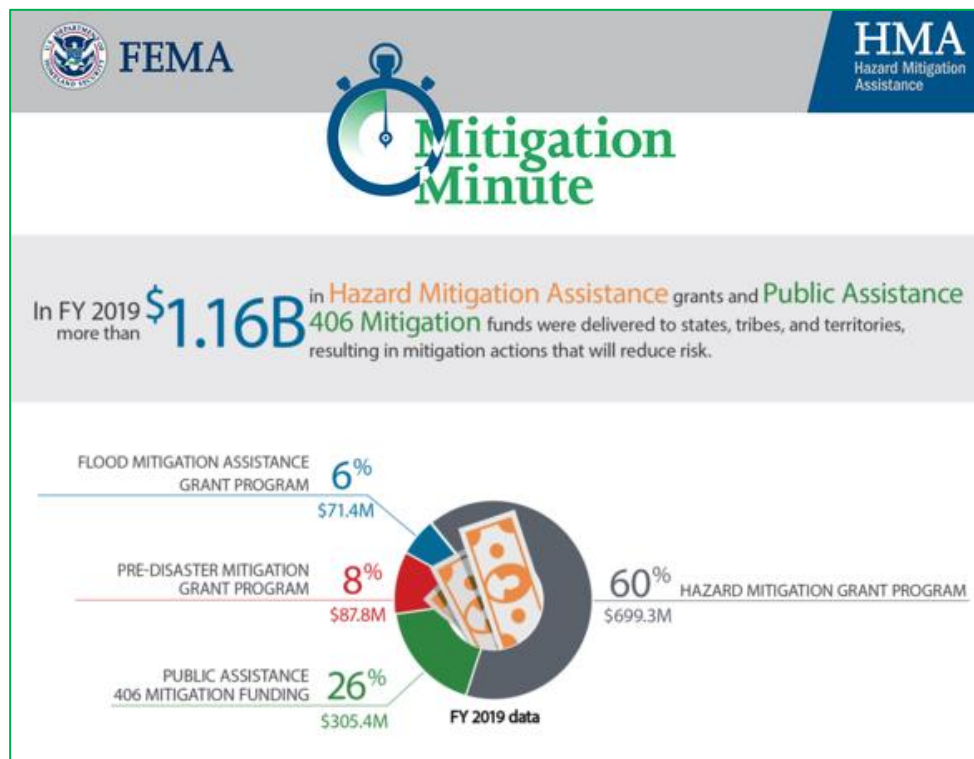
4) Future Meetings

- a) _____

Before the meeting, the planner had pre-ranked the action items based on the time frame, the town's authority to get the strategy accomplished, the type of strategy, and the STAPLEE score and placed them in four categories as shown in Chapter 9, Section A. A handout with all of the identified action items was made for the team. Using this handout, the team saw all of the action items clearly and determined any changes that needed to be made, including the "rank".

Then within each rank, the team assigned a priority. For example, if seven action items were ranked "1", the priority rank was 1-7. In this fashion, the team determined 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, except for the final review. No additional meeting was scheduled. The planner agreed to put the final "draft" plan together and email a copy for the town's review. The planner explained the process from this point forward and thanked the team for their hard work.



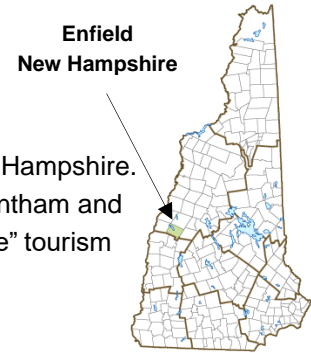
Mitigation Minute for January 15, 2020
Federal Emergency Management Agency (FEMA)

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Chapter 2: Community Profile

A. INTRODUCTION

Enfield is a beautiful community located in Grafton County in the midwestern part of New Hampshire. Enfield is bordered to the north by Canaan, to the east by Grafton, to the south by Grantham and Plainfield, and to the west by Lebanon. As a community in the “Dartmouth-Lake Sunapee” tourism region of New Hampshire, Enfield is located in the Upper Valley of New Hampshire.



TOWN GOVERNMENT

A three-member Select Board governs the Town of Enfield, with a Town Manager overseeing the day-to-day operations. The town's departments include, but are not limited to, Fire, Police, Public Works, Planning, Zoning, Recreation, and Conservation. The largest employer in Enfield is the Mascoma Regional School District, with 47+ employees, followed by Shaker Valley Auto and Keene Medical Supplies.

DEMOGRAPHICS & HOUSING

Over the last 30 years, the population of Enfield has increased. The population change from 1990 (3,983) to 2020 (4,465) showed an increase of 482 according to US Census 2020. This data represents a growth rate of approximately 12.10%.

The US Census 2020 estimates 2,468 total housing units; most are occupied (2,059) while vacant housing units total 409. The median household income is estimated to be \$79,327, and the median age is 45.3 years.⁴

EDUCATION & CHILD CARE

Students in grades K-4 attend Enfield Village School in Enfield, and students in grades 5-8 attend Indian River Middle School in the neighboring town of Canaan. Students in grades 9-12 attend Mascoma Valley Regional High School in Canaan. There are no colleges or universities in Enfield; however, there are five childcare facilities with an approximate capacity of 150 children.

Incorporated: 1761

Origin: This territory was first granted in 1761 to settlers from Enfield, Connecticut, as Endfield. In 1766, Governor John Wentworth regranted it as Relhan to honor Dr. Anthony Relhan. The doctor was a promoter of sea-bathing as a curative, making Brighton a fashionable English resort. The legislature incorporated the town as Relhan in 1788. After the Revolution, the legislature repealed the incorporation as Relhan, and the town's name reverted to Enfield. Enfield was the site of a Shaker community from 1793 to 1923; those buildings are now occupied by the La Salette Brotherhood of Montreal.

Villages and Place Names: Eastman, Enfield Center, Lower Shaker Village, Upper Shaker Village

Population, Year of the First Census Taken: 724 residents in 1790

Population Trends: Population change for Enfield totaled 2,675 over 57 years, from 1,867 in 1960 to 4,542 in 2017. The largest decennial percent change was between 1970 and 1980, when the population increased by 35 percent. The 2017 Census estimate for Enfield was 4,542 residents, which ranked 81st among New Hampshire's incorporated cities and towns.

Population Density and Land Area, 2017 (US Census Bureau): 112.7 persons per square mile of land area. Enfield contains 40.3 square miles of land area and 2.9 square miles of inland water area.

Source: Economic & Labor Market Information Bureau, NH Employment Security, January 2021; Received 8/14/2020

⁴ US Census 2020

NATURAL FEATURES

The Town of Enfield covers approximately 40.3 square miles of land area and 2.9 square miles of inland water. The community is dominated by the lakes, rivers, and streams of central New Hampshire. The highest peak is Prospect Hill, at 2,100' above sea level. The lowest elevation in town is 751' above sea level at Mascoma Lake.

Vegetation is typical of northern New England, including deciduous and conifer forests, open fields, swamps, and riverine areas. The terrain lends itself to an abundance of small ponds, streams, and rivers, notably Mascoma Lake, Crystal Lake, Spectacle Pond, and Smith Pond.

TRANSPORTATION

Three major routes run through Enfield; Interstate 89 runs north-south, US Route 4 in the far north corner runs east-west, and NH Route 4A runs north-south. Other more minor and less traveled roadways lend access to other areas of the town.

B. EMERGENCY SERVICES

EMERGENCY OPERATIONS CENTER & EMERGENCY MANAGEMENT DIRECTOR

The Town of Enfield has a designated Emergency Management Director (EMD). The EMD maintains an Emergency Operations Center (EOC) as part of the town's emergency preparedness program. The EOC is where the EMD, department heads, government officials, and volunteer agencies gather to coordinate their response to a significant emergency or disaster event. In Enfield, the designated EOC is the Police Station.

ENFIELD FIRE DEPARTMENT & EMS

The Enfield Fire Department is an on-call fire department providing quality fire services to the residents and visitors of Enfield 24 hours a day, 365 days a year. The department staffs a part-time call Chief, 30 part-time call firefighters and operates two stations within the community. The Enfield Fire Department participates in the Upper Valley Regional Emergency Services Association and area departments. Enfield FAST Squad provides emergency medical services and transportation.

ENFIELD POLICE DEPARTMENT

The Police Department staffs seven full-time sworn officers, including a full-time Chief, two part-time sworn officers and several non-sworn personnel. Enfield Police Officers are well-trained in delivering police services in an atmosphere of regional cooperation. They 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 Enfield. The Enfield Police Department has mutual aid agreements with their bordering towns.

The Enfield Police Department is a full-time department providing quality law enforcement services to the residents and visitors of Enfield. The department staffs a full-time Chief, six full-time and three part-time officers, and two supporting staff. The Enfield Police Department has mutual aid with the NH State Police, the Grafton County Sheriff's Office, and surrounding towns.

ENFIELD DEPARTMENT OF PUBLIC WORKS (DPW)

The Enfield Department of Public Works (DPW) operates on a year-round, 24-hour basis as needed. The department staffs a full-time Director, 15 full-time and five part-time employees. The DPW's mission is to support the citizens of Enfield through the safe operation, proper maintenance, and future development of highways, supporting infrastructure and utilities in a cost-conscious manner without sacrificing quality. The DPW belongs to the NH Public Works Mutual Aid Association.

MEDICAL FACILITIES

Enfield's closest medical facility is Dartmouth-Hitchcock Medical Center in Lebanon (10 miles; 396 beds). An alternative medical facility is Alice Peak Day Memorial Hospital in Lebanon (8 miles, 24 beds) if the need arises.

EMERGENCY SHELTER(S)

The primary shelter is where evacuees are directed at the time of an emergency. In Enfield, the designated primary shelter is the Enfield Community Building which offers a large sleeping area, restrooms, and kitchen facilities. The Community Building has a permanent generator. The designated secondary shelter for the town is the Enfield Village School.

C. ENFIELD'S CURRENT & FUTURE DEVELOPMENT TRENDS

Between 2008 and 2019, development in Enfield was consistent with development trends in the rest of New Hampshire. Nearly every New Hampshire community experienced a significant drop in new home construction after the Great Recession of 2008. Enfield was no exception, as shown in the chart to the right from City-Data.com⁵. This trend has begun to change in Enfield, and the rest of the state, mainly since Covid-19 arrived in New England.

As reported by the Enfield Building Inspector in the 2020 Annual Report, 2020 ended "...with a total of 142 permits. This is about a 15% increase from the previous year." In the same report, the Zoning Board of Adjustment states, "...hearings were held (or continued) for 4 variance applications and 3 special exception applications. The Land Use and Community Development Administrator investigated and took action on four (4) Zoning Violations...."⁶

The newly issued 2021 Annual Report contains further evidence that Enfield's building, home improvements, and new construction projects are increasing. 2021 turned out as predicted by the Building Inspector in the 2020 Annual Report when he stated, "The start of 2021 indicates that this (increase in permits) will continue."

Single-family new house Construction building permits

1997: 15 buildings, average cost: \$90,000
1998: 14 buildings, average cost: \$110,000
1999: 15 buildings, average cost: \$150,000
2000: 23 buildings, average cost: \$218,200
2001: 25 buildings, average cost: \$204,200
2002: 27 buildings, average cost: \$153,200
2003: 21 buildings, average cost: \$130,200
2004: 30 buildings, average cost: \$205,700
2005: 22 buildings, average cost: \$251,600
2006: 20 buildings, average cost: \$224,800
2007: 17 buildings, average cost: \$277,900
2008: 13 buildings, average cost: \$242,300
2009: 9 buildings, average cost: \$219,800
2010: 7 buildings, average cost: \$282,900
2011: 10 buildings, average cost: \$240,500
2012: 5 buildings, average cost: \$249,000
2013: 6 buildings, average cost: \$272,500
2014: 10 buildings, average cost: \$325,000
2015: 6 buildings, average cost: \$240,000
2016: 14 buildings, average cost: \$300,000
2017: 16 buildings, average cost: \$340,000
2018: 10 buildings, average cost: \$700,000
2019: 8 buildings, average cost: \$325,000

⁵ City-Data.com; <http://www.city-data.com/city/Enfield-New-Hampshire.html>

⁶ 2020 Annual Report, Enfield, New Hampshire, pages 187 (BI/HO/FI) & 235 (ZBA)

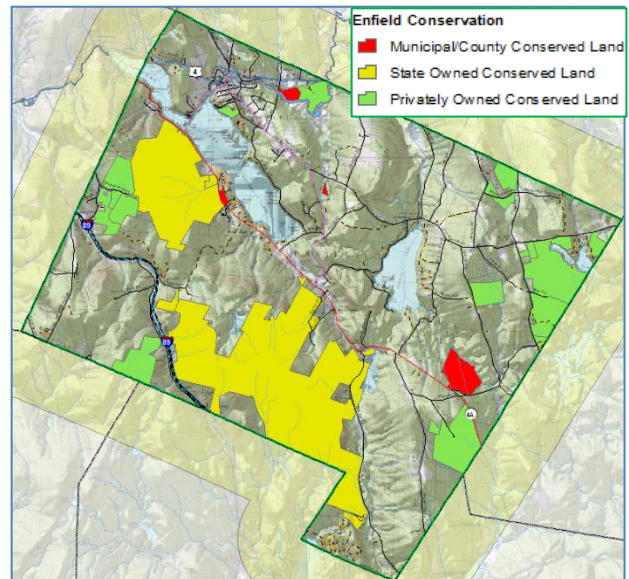
The Building Inspector's 2021 Report states, *"The national construction industry as a whole functioned at high production levels in 2021, and the Building Inspector issued 151 total permits during the year which is an above average amount for Enfield. Ten permits for new homes were approved, and another ten existing permits for single and two-family homes were renewed for ongoing construction. Although total permit numbers for all types of construction projects were elevated beyond previous norms, the amount of new homes added to the Town was actually less than normally expected."*⁷

The Planning Board held 19 meetings in 2020 and 22 meetings in 2021. The chart to the right, derived from both the 2020 and 2021 Enfield Annual Reports, shows the increase in *"business items"* between the two years. *The Zoning Board reported that in 2021, "...hearings were held for six (6) variance applications and 2 special exception applications...."* Data from the 2020 and 2021 Annual Reports appear to indicate that although permitting has increased, requests for major subdivisions and new homes have remained stable.⁸

Planning Board Activity 2020 & 2021			
Business Items	2020	2021	Change (1 year)
Minor Subdivisions	2	6	4
Major Subdivisions	0	1	1
Minor Site Plan Review	4	2	-2
Major Site Plan Review	2	1	-1
Boundary Line Adjustment	2	2	0
Voluntary Lot Merger	1	2	1
Scenic Road Hearing	0	1	1
Totals	11	15	4

Since early in the Covid-19 pandemic, it became apparent in nearly every New Hampshire community and the US that the real estate market is booming. Whether the current market is due to the pandemic or other factors is yet to be determined, but New Hampshire has had a red-hot seller's market for the past year.

Enfield town officials will monitor and guide growth and development using the Master Plan, Subdivision Regulations, the Site Plan Review process, and the Zoning Ordinance, including the Floodplain Development Ordinance. The Land Use and Community Development Administrator, the Planning Board, the Select Board, the Zoning Board of Adjustment, the Building Inspector, and other town officials are almost always aware of construction that is taking place. Building permits are required.



Enfield has established a Municipal Facilities Committee to upgrade the Town Hall and Library and build a new Public Safety Facility. The town's boards will ensure that future building plans consider any risk from natural hazards and that any new facilities will be built to mitigate the potential impact of flooding. The Planning Board will follow town regulations to ensure that any construction in hazardous areas will be built to minimize vulnerability to the hazards identified in this plan. The town recognizes the importance of growth and understands the impact of hazards on new facilities and homes if built within the community's hazard-prone areas.

⁷ 2021 Annual Report, Enfield, NH; page 189

⁸ 2020 Annual Report, page 226; 2021 Annual Report, page 210

TABLE 2.1: TOWN STATISTICS

Table 2.1 - Town Statistic				
Census Population Data	2020	2010	2000	1990
Enfield, NH - Census Population Data	4,465	4,582	4,626	3,983
Grafton County	91,118	89,118	81,826	74,998
Elderly Population-% over 65 (ACS 2015-2019*)	20.6%			
Median Age (ACS 2015-2019*)	45.1			
Median Household Income (ACS 2015-2019*)	\$82,212			
Individuals below the poverty level (ACS 2015-2019*)	4.0%			
Change in Population-Summer Weekends (%)	25%			
Change in Population-Winter Weekends (%)	0%			
Housing Statistics (ACS 2015-2019)				
Total Housing Units	2,468			
Occupied Housing Units	2,059			
Vacant Housing Units	409			
Assessed Structure Value (2021-MS1)				
Type of Structure	Value		1% Damage	5% Damage
Residential	\$304,850,400		\$3,048,504	\$15,242,520
Manufactured Housing	\$14,395,000		\$143,950	\$719,750
Commercial	\$32,187,300		\$321,873	\$1,609,365
Tax Exempt	\$16,038,400		\$160,384	\$801,920
Utilities	\$9,944,200		\$99,442	\$497,210
Totals	\$377,415,300		\$3,774,153	\$18,870,765
The chart above shows the structure values provided in the town's 2021 Annual Report, page 120. These values are used to estimate structure loss "value" due to natural hazards (see Chapter 5), which is based on a loss of 0-1% or 1-5% of structures.				
Regional Coordination				
County	Grafton			
Tourism Region	Dartmouth-Lake Sunapee			
Municipal Services & Government				
Town Manager	Yes			
Select Board (3 member)	Yes, elected			
Planning Board	Yes, appointed			
School Board	Yes, elected			
Budget Committee	Yes, elected			
Zoning Board of Adjustment	Yes, elected			
Conservation Commission	Yes, appointed			
Master Plan	Yes, 1995/2022 (currently updating))			
Emergency Operation Plan (EOP)	Yes, September 8, 2015			
Hazard Mitigation Plan (HMP)	Yes, 2015			

Table 2.1 - Town Statistic	
<i>Zoning Ordinances</i>	Yes, 1974/March 10, 2020
<i>Subdivisions Regulations</i>	Yes, 1974/October 11, 2017
<i>Site Plan Review Regulations</i>	Yes, 1976/October 11, 2017
<i>Capital Improvement Plan (CIP)</i>	Yes, reviewed annually (5-year plan, 2022-2027)
<i>Capital Reserve Funds (CRF)</i>	Yes, reviewed annually
<i>Building Permits Required</i>	Yes
<i>Town Web Site</i>	Yes, www.enfield.nh.us
<i>Floodplain Ordinance</i>	Yes, part of the Zoning Ordinance
<i>Member of NFIP</i>	May 17, 1988
<i>Flood Insurance Rate Maps (DFIRMS)</i>	February 20, 2008
<i>Flood Insurance Rate Study (FIS)</i>	February 20, 2008
Percent of Local Assessed Valuation by Property Type - 2019 (NH Department of Revenue)	
<i>Residential Buildings</i>	90.4%
<i>Commercial Land & Buildings</i>	8.1%
<i>Other (including Utilities)</i>	1.5%
Emergency Services	
<i>Town Emergency Warning System(s)</i>	CodeRED
<i>School Emergency Warning System(s)</i>	AlertNow
<i>Emergency Page</i>	No
<i>Social Media</i>	Facebook: Town, Police Department, Fire Department, Recreation Department & Library
<i>ListServ or Subscription Service</i>	Yes, hosted by Dartmouth College, the Enfield Listserv; also, a town email distribution list sent out to those residents who have subscribed
<i>Local Newspapers</i>	Valley News (Lebanon)
<i>Public Access TV</i>	Yes; Channel 8 (Comcast), Enfield TV
<i>Local TV Stations</i>	WMUR, Channel 9
<i>Local Radio</i>	Great Eastern Radio (W. Lebanon); WNTK (New London)
<i>Police Department</i>	Yes, full-time Chief, six full-time sworn officers, 3 part-time sworn officers, two support staff
<i>Police Dispatch</i>	Hanover Dispatch
<i>Police Mutual Aid</i>	Surrounding towns, NH State Police, Grafton County Sheriff's Office
<i>Animal Control Officer</i>	No - handled by the Police Department
<i>Fire Department</i>	Yes, Chief (part-time, call-position), 30 part-time call firefighters
<i>Fire Dispatch</i>	Hanover Dispatch
<i>Fire Mutual Aid</i>	Upper Valley Mutual Aid Association
<i>Fire Stations</i>	Two
<i>Fire Warden</i>	Yes

Table 2.1 - Town Statistic	
<i>Emergency Medical Services</i>	Enfield FAST Squad
<i>EMS Dispatch</i>	Hanover Dispatch
<i>Emergency Medical Transportation</i>	Enfield FAST Squad
<i>HazMat Team</i>	Midwestern Region HazMat Team
<i>Established Emergency Management Director (EMD)</i>	Yes
<i>Established Deputy EMD</i>	Yes
<i>Line of Succession (should EMD be out of the area)</i>	1st - Deputy EMD
	2nd - Fire Chief
	3rd - Town Manager or designee
<i>Public Health Network</i>	Upper Valley Regional Public Health Network
<i>Health Officer</i>	Yes
<i>Deputy Health Officer</i>	Select Board
<i>Building Inspector</i>	Yes
<i>Established Public Information Officer (PIO)</i>	Town Manager (unless the situation warrants an alternative)
<i>Nearest Hospital(s)</i>	Dartmouth-Hitchcock Medical Center, Lebanon (10 miles, 396 beds)
	Alice Peck Day Memorial Hospital, Lebanon (8 miles, 24 beds)
<i>Local Humane Society or Veterinarians</i>	Cardigan Veterinary Clinic, Saves (Lebanon, 24 hours), Stoney Brook Veterinary Hospital, Upper Valley Humane Society
<i>Primary EOC</i>	Police Station (generator)
<i>Secondary EOC</i>	Department of Public Works (generator)
<i>Primary Shelter</i>	Enfield Community Building (generator capable)
<i>Secondary Shelter</i>	Enfield Village School (no generator)
Utilities	
<i>Town Sewer</i>	Municipal & private septic
<i>Department of Public Works</i>	Yes, full-time Director, 15 full-time, five part-time
<i>Miles of Class V Roads</i>	33 paved, 33 gravel, 66 total miles
<i>NH Public Works Mutual Aid</i>	Yes
<i>Water Supply</i>	Municipal & private wells
<i>Waste Water Treatment Plant</i>	No (goes to Lebanon, inter-municipal agreement)
<i>Electric Supplier</i>	Eversource Energy, Liberty Utilities, NH Electric Coop
<i>Natural Gas Supplier</i>	None
<i>Cellular Telephone Access</i>	Yes (small pockets of dead zones)
<i>Pipelines</i>	No
<i>High-Speed Internet</i>	Yes (good in the Village; some places do not have high speed)
<i>Telephone Company</i>	Consolidated Communications, Comcast

Table 2.1 - Town Statistic

Transportation		
Primary Evacuation Routes	Interstate 89, US Route 4, NH Route 4A	
Secondary Evacuation Routes	None	
Nearest Interstate	Interstate 89, Exits 14-16 (local access)	
Nearest Commercial Airport(s)	Lebanon Municipal, Lebanon (11 miles)	
	Manchester-Boston Regional Airport, Manchester (73 miles)	
Public Transportation	Advanced Transit	
Railroad	No	
Education & Childcare		
Elementary School	Enfield Village School grades K-4	
Middle School	Indian River (Canaan) School grades 5-8 with Canaan, Dorchester, Grafton, and Orange	
High School	Mascoma Valley Regional High School (Canaan) grades 9-12 with Canaan, Dorchester, Grafton, and Orange	
School Administrative Unit	SAU 62	
Private School	None	
Licensed Childcare Facilities	Five facilities, approximate 150 capacity	
Conserved Land as a Percent of Land in the Community (GIS Analysis; 2019 Conservation Files, Granit, UNH)		
	Square Miles	Percent of Town Land
Approximate Square Miles in Community	40.30	100.0%
Approximate Total Un-Conserved Land	30.38	75.4%
Approximate Total Conserved Land	9.92	24.6%
Municipal/County Land (1)	0.59	1.5%
Federal Owned Land (2)	0.00	0.0%
State Owned Land (3)	6.58	16.3%
Quasi Private (4)	0.00	0.0%
Private Land (5)	2.74	6.8%
Fire Statistics (NH Division of Forests & Lands, Fire Warden Report and the town)		
Wildfire Fires (2016-2019)	1 fire, < 5 acres	
Grafton County Fire Statistics (2020)	19 fires, 18 acres	
State Forest Fires Statistics (2020)	113 fires, 89 acres	
Information found in Table 2.1, unless otherwise noted, was derived from the Economic & Labor Market Information Bureau, NH Employment Security, January 2021. Community Response Received 8/14/2020, https://www.nhes.nh.gov/elmi/products/cp/profiles-pdf/enfield.pdf		

Chapter 3: Hazard Identification, Risk Assessment & Probability

A. HAZARD IDENTIFICATION

The first step in hazard mitigation is to identify hazards. The team determined that eleven natural hazards have the potential to affect the community. *Table 3.1, Hazard Identification & Risk Assessment (HIRA)*, estimates the level of impact that 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.

The NH State Hazard Mitigation Plan includes many of the same potential hazards that have been identified in Enfield. However, several of the state's hazards were excluded from this plan. These include the following:

<u>State Hazard</u>	<u>Reason for exclusion from this plan</u>
Coastal Flooding	Distance away from the sea
Solar Storm & Space Weather	The team felt this was not something the town could manage
Avalanches	No known areas of avalanches
Radiological	Distance away from any radiological sites
Known & Emerging Contaminants	Homeowners would handle mitigation

Specific hazards that have affected the town, the region and the state in the past are detailed in *Table 3.2, Historic Hazard Identification*, and Chapter 5.

B. RISK ASSESSMENT

The hazards listed in Table 3.1 were classified based upon the "Relative Threat" score as calculated in Column F; these were then separated into three categories using Jenks' Optimization, also known as the natural breaks classification⁹. The "Relative Threat" score was then labeled into three categories, *High Risk, Medium Risk, and Low Risk*, as shown in Table 3.1, Column G; these categories are also indicated in Chapter 5, Sections B-D. The plan demonstrates each hazard's likelihood of occurrence combined with its potential effect on the town. This process illustrates a comprehensive hazard statement and helps the town understand which hazards should receive the most attention.

In addition to the relative threat analysis determined in Table 3.1, the team used *Tables 4-1-4.4, Critical Infrastructure & Key Resources (CIKR)*, to identify and analyze the potential hazard risk based on a scale of 1-3 for each CIKR.

⁹ The natural breaks classification process is a method of manual data classification partitions data into classes based upon natural groups within the data distribution; ESRI, <http://support.esri.com/en/knowledgebase/GISDictionary/term/natural%20breaks%20classification>

C. PROBABILITY

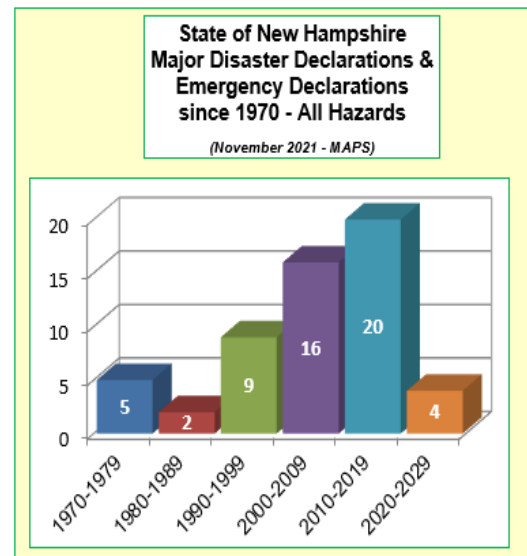
The determination of the probability of occurrence is contained within Column D in Table 3.1, which assesses hazards based upon the likelihood that the hazards will occur within 25 years. The probability scores indicate whether the identified hazard has a *Very Low, Low, Moderate, High, or Very High* probability. Probability categories are also indicated in Chapter 5, Sections B-D. The natural hazards with the highest risk assessment include Severe Winter Weather followed by Inland Flooding. All other hazards were assessed at medium or low risk (see Table 3.1 on the following page).

Overall, Enfield is reasonably safe from natural, technological, and human-caused hazards. However, due to Enfield's geographic location within the Dartmouth-Lake Sunapee tourism region and the forested lands, hills, heavy snowpack, and topography that is found there, there is always a probability that future hazards will occur.

HAZARD PROBABILITY & CLIMATE CHANGE

Although not identified as a natural hazard in this plan, no plan can be considered complete without discussing climate change's impact on weather patterns. *"The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding, and higher sea levels, could significantly alter the types and magnitudes of hazards impacting states in the future"*, FEMA stated in its State Mitigation Plan Review Guide¹⁰. FEMA recognizes climate change by including climate change in the hazard mitigation guide for state planners.

The chart to the right shows the increased frequency of Major Disaster Declarations (DR) and Emergency Declarations (EM) in New Hampshire, possibly indicating the impact of climate change.¹¹ The decade beginning in 2020 includes four disaster declarations: DR-4516 and EM-3445 (Covid-19), DR-4622 (Cheshire County), and DR-4624 (Cheshire and Sullivan Counties).



Communities in New Hampshire, such as Enfield, should become increasingly aware of climate change's impact on the hazards already experienced and anticipate an increase in probability in the future.

HAZARD PROBABILITY COMBINED WITH LONG-TERM UTILITY OUTAGE

Any potential disaster in Enfield is particularly impactful if combined with a long-term utility outage, as would most likely be the case with severe winter storms, blizzards, ice storms, hurricanes, tropical storms, and windstorms. An outage could result in frozen pipes and a lack of water and heat during the winter months, a particular concern for the town's elderly and vulnerable citizens. The food supply of individual citizens could become quickly depleted should a power failure last for a week or more. When combined with a long-term utility outage, any hazard's effects could have a higher probability of damaging impacts on the community.

¹⁰ State Mitigation Plan Review Guide, FEMA, Released March 2015, Effective March 2016, Section 3.2, page 13

¹¹ Derived from FEMA's record of disasters; categorized by decade since 1970 by the planner; 2020-2029 includes Covid-19

TABLE 3.1: HAZARD IDENTIFICATION & RISK ASSESSMENT (HIRA)

Table 3.1 - Hazard Identification & Risk Assessment (HIRA)							
Scoring for Probability (Columns A, B & C)	Column A	Column B	Column C	Column D	Column E (A+B+C)/3	Column F D x E	Column G Risk
1=Very Low (0-20%)	What is the probability of death or injury?	What is the probability of physical losses & damage?	What is the probability of interruption of service?	What is the probability of this occurring within 25 years?	Average of Human, Property & Business Impact	Relative Threat	High 10-16.9 Medium 5.0-9.9
2=Low (21-40%)							
3=Moderate (41-60%)							
4=High (61-80%)	Human Impact	Property Impact	Business Impact	Probability of Occurrence	Severity	Risk Severity x Occurrence	Low 0.0-4.9
5=Very High (81-100%)							
Natural Hazards							
1) Severe Winter Weather	2.00	4.00	4.00	5.00	3.33	16.67	High
2) Inland Flooding	1.00	3.00	2.00	5.00	2.00	10.00	High
3) Extreme Temperatures	1.00	2.00	2.00	5.00	1.67	8.33	Medium
4) High Wind Events	1.00	3.00	3.00	3.00	2.33	7.00	Medium
5) Lightning & Hail	1.00	2.00	2.00	3.00	1.67	5.00	Medium
6) Landslide & Erosion	1.00	3.00	1.00	3.00	1.67	5.00	Medium
7) Infectious Diseases	2.00	1.00	4.00	2.00	2.33	4.67	Low
8) Tropical & Post-Tropical Cyclones	1.00	3.00	2.00	2.00	2.00	4.00	Low
9) Wildfires	1.00	3.00	2.00	2.00	2.00	4.00	Low
10) Earthquakes	1.00	2.00	2.00	2.00	1.67	3.33	Low
11) Drought	1.00	2.00	1.00	2.00	1.33	2.67	Low
Technological Hazards							
1) Aging Infrastructure	1.00	2.00	3.00	4.00	2.00	8.00	Medium
2) Dam Failure	3.00	3.00	3.00	2.00	3.00	6.00	Medium
3) Long Term Utility Outage	1.00	1.00	3.00	3.00	1.67	5.00	Medium
4) Hazardous Materials	1.00	2.00	2.00	1.00	1.67	1.67	Low
5) Conflagration	1.00	2.00	2.00	1.00	1.67	1.67	Low
Human-Caused Hazards							
1) Mass Casualty Incidents	5.00	2.00	2.00	3.00	3.00	9.00	Medium
2) Transport Accidents	3.00	3.00	3.00	3.00	3.00	9.00	Medium
3) Terrorism & Violence	3.00	3.00	3.00	2.00	3.00	6.00	Medium
4) Cyber Events	1.00	1.00	3.00	3.00	1.67	5.00	Medium

D. NATIONAL FLOOD INSURANCE PROGRAM (NFIP) STATUS

Enfield has been a National Flood Insurance Program (NFIP) member since May 17, 1988. The latest Flood Insurance Rate Studies (FIRS) and Digital Flood Insurance Rate Maps (DFIRMS) are dated February 20, 2008.

Enfield has a relatively minor flood plain with approximately 5.4 square miles of land in the 100 and 200-year floodplains, including 2.9 square miles of inland water. After subtracting inland water from the floodplain, Enfield's floodplain is shown to comprise approximately 2.5 squares of the land in the community.

According to the New Hampshire Bureau of Economic Affairs (BEA/OSI), there are 29 NFIP policies in effect in Enfield, including 22 single-family and seven non-residential policies. There have been three paid losses for a total of \$36,367. The BEA/OSI reports that there have been no repetitive loss claims.¹²

Enfield is likely to experience flooding on several roads and along most rivers and streams, but the overall flood risk due to riverine and 100-year flood events is minimal. The floodplain areas are primarily along the Mascoma River, the Knox River, Crystal Lake Brook, Bicknell Brook, Moose Brook, Gulf Brook, and Little Brook. The floodplain is also indicated around Enfield's lakes and ponds, particularly around Mascoma Lake, Crystal Lake, Spectacle Pond, Smith Pond, George Pond, and two relatively large swampy areas near the boundary with Canaan.

Lastly, inundation studies for Goose Pond Dam and Crystal Lake Dam (both in Canaan), and Smith Pond Dam (Enfield), follow much the same path as the FEMA floodplain. Please refer to Chapter 5 for more information on inland flooding and dam failure.

ZONING AND FLOODPLAIN DEVELOPMENT ORDINANCE

As part of the Zoning Ordinance, the Floodplain Development Ordinance was adopted on March 9, 1993; it was revised in March 1994 and March 2007. The Floodplain Development Ordinance states, "As approved at Enfield Town Meeting 1988, all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its Flood Town of Enfield, NH Zoning Ordinance Amended March 10, 2020 Insurance Rate Maps (FIRM) and Flood Boundary and Floodway maps of the Town of Enfield, NH dated November 17, 1987 are declared to be a part of this Ordinance.

¹² NH Bureau of Economic Affairs (OSI); Jennifer Gilbert, July 6, 2020



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

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>

Applications for variances or exceptions shall be made to and be considered by the Zoning Board of Adjustment; after examining the applicant's hardships, the Zoning Board shall approve or disapprove a request based on the criteria set forth in Section 60.6 of the National Flood Insurance Program (NFIP) with Amendments and Related Regulations dated June 30, 1987 and other criteria consistent within the total Ordinance."¹³

Details of the Floodplain Development Ordinance begin with the following statement, *"This Ordinance, adopted, pursuant to the authority of RSA 674:16, shall be known as the Town of Enfield Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement the regulations in the Town of Enfield Zoning Ordinance, and shall be considered part of the Zoning Ordinance for purposes of administration and appeals under state law. If any provision of this ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall be controlling. If any provision of this ordinance differs or appears to conflict with any provision of the Zoning Ordinance or other ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall prevail."*¹⁴

The Planning Board, as the initiator and the Select Board as the enforcer, adhere to the rules, regulations, and requirements outlined in the Enfield Development Floodplain and Zoning Ordinances. As part of the Zoning Ordinance, the Floodplain Development Ordinance guides the Planning Board when reviewing development proposals and ensures compliance and enforcement of NFIP standards. The Enfield Floodplain and Zoning Ordinances can be found on the town's website.¹⁵

Below is a brief description of each section of the Enfield Floodplain Ordinance. Items in italic are taken directly from the ordinance.

ITEM I – Definition of Terms

Item I states, *"The following definitions shall apply only to this Floodplain Development Ordinance, and shall not be affected by, the provisions of any other ordinance of the Town of Enfield"*.

ITEM II

Item II states, *"All proposed development in any special flood hazard areas shall require a permit."*

ITEM III.

Item III states, *"The Building Inspector shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding."*

Item III discusses anchoring, using flood-resistant materials, methods and practices to minimize flood damage and the construction of utilities, etc., to prevent flooding within components.

ITEM IV

Item IV discusses the need for the applicator to *"...provide the Building Inspector with assurance..."* that sanitary systems *"minimize or eliminate infiltration of flood waters"* and that *"on-site waste disposal systems will be located to avoid impairment to them or contamination from them during periods of flooding."*

¹³ Enfield Zoning and Floodplain Development Ordinance, Section 407, Special Flood Hazard Areas, page 42

¹⁴ Ibid, page 88

¹⁵ https://www.enfield.nh.us/sites/g/files/vyhlif3106/f/uploads/current_zoning_ordinance_2020-_updated_march_10_2020_final_0.pdf

ITEM V

Item V discusses *“certification of flood proofing and the as built elevation...of the lowest floor...”* and that *“...The applicant must furnish...information to the Building Inspector”*.

ITEM VI

Item VI states, *“The Building Inspector shall not grant a building permit until the applicant certifies that all necessary permits have been received from those governmental 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.”*

ITEM VII

Item VII discusses “riverain situations”, the “relocation of watercourses”, assurances that “the altered or relocated portion of any watercourses...can and will be maintained”; it also details the requirement that development located in the “Regulatory Floodway...would not result in any increase in flood levels within the community during the base flood discharge.” Item VII discusses encroachments notification to the Wetlands Bureau of the Department of Environmental Services (DES), the requirements (per RSA 482-A.3) to submit copies to the Building Inspector, and that certification from a professional engineer is supplied. Also, Item VII states, *“Until a Regulatory Floodway is designated along watercourses, no new construction, substantial improvements, or other development (including fill) shall be permitted within Zone AE on the FIRM, unless it is demonstrated by the applicant that the cumulative effect of the proposed development, when combined with all existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community....”*

ITEM VIII

Item VIII details the use of data used by the Building Inspector as criteria for new construction and substantial developments for residential structures, non-residential structures, manufactured homes, recreational vehicles, and *“fully enclosed areas below the lowest floor that are subject to flooding”*. Item VIII also states, *“Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria: A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.”*

ITEM IX

The final section, Item VIII discusses the variance and appeals process.

The team understands that the benefits of the NFIP also extend to structures that are not in the 100-year floodplain. The team felt that it is worthwhile to have NFIP brochures and information available at the Town Hall for current homeowners and potential developers and has included several flood-related mitigation strategies in this plan. The town will continue to work with the Bureau of Economic Affairs/OSI and carefully monitor its compliance with the NFIP.

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

TABLE 3.2: HISTORIC HAZARD IDENTIFICATION

Key for Table 3.2

2015 HMPT 2015 Hazard Mitigation Planning Team
2022 HMPT 2022 Hazard Mitigation Planning Team
DR Major Disaster Declarations (DR) since 1953
EM Emergency Declarations (EM) since 1953
FM Fire Management Assistance Declaration (FM) since 1953

Table 3.2 includes the following sections:

A. Inland Flooding	D. Severe Winter Weather	G. Miscellaneous Hazards
B. Wildfires	E. Earthquakes	H. Other Hazards
C. High Wind Events	F. Drought	

Type of Event	Date of Event	Location	Description	Source
A. Inland flooding includes flooding caused by 100-year rain events, heavy rainfall, rapid snowmelt, ice jam flooding, dam failure & local road flooding: Riverine flooding is the most common disaster event in NH. Significant riverine flooding in some areas of the state occurs in less than ten-year intervals and seems to be increasing with climate change. The entire State of NH has a high flood risk. Flood events have the potential to impact the community on a townwide basis. Enfield has had no significant flooding events since July 11-12, 2019 (DR-4457).				
Summary of flood events including Major Disaster & Emergency Declarations in the state & regionwide				
Flooding Before 1970	1927, 1936, 1938, 1943 (2), 1953, 1955, 1959			See below
Flooding 1970-1979	1972 (DR-327), 1973 (DR-399), 1974 (DR-411), 1976, 1978 (DR-549), 1979 (EM-3073)			
Flooding 1980-1989	1986 (DR-771), 1987 (DR-789)			
Flooding 1990-1999	1990 (DR-876), 1991 (DR-923), 1991 (DR -917), 1995, 1996 (DR-1077), 1996 (DR-1144), 1998 (DR-1231)			
Flooding 2000-2009	2003 (DR-1489), 2005 (DR-1610), 2006 (DR-1643), 2007 (DR-1695), 2008 (DR-1787), 2008 (DR-1799)			
Flooding 2010 - 2019	2010 (DR-1892), 2010 (DR-1913), 2011 (DR-4006), 2012 (DR-4065), 2013 (DR-4139), 2015 (DR-4206), 2017 (DR-4329), 2017 (DR-4355), 2018 (DR-4370), 2019 (DR-4457)			
Flooding 2020 - Present	2021 (DR-4622), 2021 (DR-4624)			

Type of Event	Date of Event	Location	Description	Source
A detailed summary of flood events in the community				
Inland Flooding (Heavy Rain)	July 11, 1973	All Ten NH Counties	Major Disaster Declaration DR-399: In Enfield, there was significant flooding, and at least four bridges were damaged or destroyed.	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain)	March 30-April 11, 1987	Carroll, Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Major Disaster Declaration DR-789: Flooding of low-lying areas along river caused by snowmelt and heavy rain	FEMA, 2015 HMP & 2022 HMPT
Inland Flooding (Heavy Rain)	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Sullivan	Major Disaster Declaration DR-876: Flooding caused by a series of storm events with moderate to heavy rain	FEMA, 2015 HMP & 2022 HMPT
Inland Flooding (Heavy Rain)	October 20-November 15, 1995	Carroll, Cheshire, Coos, Grafton, Merrimack & Sullivan	Major Disaster Declaration DR-1077: In Enfield, flooding within the low laying areas near Lovejoy Brook Road on Route 4 caused road washouts and structural damage.	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain)	October 20-23, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Major Disaster Declaration DR-1144: In Enfield, flooding caused by heavy rain in the Lovejoy Brook area caused road washouts and bridge damage. The bridge has been replaced and seems to have stopped the flooding.	FEMA, 2015 HMP & 2022 HMPT
Inland Flooding (Heavy Rain)	October 7-18, 2005	Belknap, Cheshire, Grafton, Hillsborough, Merrimack & Sullivan	Major Disaster Declaration DR-1610: 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. There were severe storms and flooding in the area, particularly in Alstead, but no significant damage occurred in Enfield.	FEMA, 2015 HMP & 2022 HMPT
Inland Flooding (Heavy Rain)	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	Major Disaster Declaration DR-1643: Flooding occurred in most of southern NH during May 12-23, 2006. (Mother's Day Storm). In Enfield, some of the higher elevations were hit with minor road washouts along the shoulders of Methodist Hill Road, Smith Pond Road, and other roads near I-89, Exit 16.	FEMA & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Inland Flooding (Heavy Rain)	April 15-23, 2007	All Ten NH Counties	Major Disaster Declaration DR-1695: FEMA & SBA obligated more than \$27.9 million in disaster aid for flood damages following the April nor'easter (Tax Day Storm). Although there was no recollection of storm damage during this event, Enfield expected to receive heavy rain.	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain & Tornado)	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	Major Disaster Declaration DR-1787: A period of severe storms and flooding from July 24-August 14 also spawned a tornado on July 24, 2008. There is no local recollection of this storm causing damage or flooding, but Enfield expected to receive heavy rain.	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain)	February 23 - March 3, 2010	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Major Disaster Declaration: DR-1892: See below, Section D	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain)	May 26-30, 2011	Coos & Grafton County	Major Disaster Declaration DR-4006: Flooding and hail occurred due to a severe storm on May 26th-30th 2011 in Coos & Grafton County. (aka Memorial Day Weekend Storm). There is no local recollection of this storm causing damage or flooding, but Enfield expected to receive heavy rain.	FEMA & 2022 HMPT
Inland Flooding (Tropical Storm Irene)	August 26-September 6, 2011	EM 3333: All Ten NH Counties DR-4026: Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	Major Disaster Declaration DR-4026 & Emergency Declaration EM-3333: See below, Section C	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain)	July 9-10, 2013	Cheshire, Sullivan & Grafton	Major Disaster Declaration DR-4139: Severe storms, flooding, and landslides occurred from June 26 to July 3, 2013, in Cheshire and Sullivan Counties and southern Grafton County. Severe storms, flooding, and landslide. There is no local recollection of this storm causing damage or flooding, but Enfield expected to receive heavy rain.	FEMA, 2015 HMP & 2022 HMPT
Inland Flooding (Heavy Rain) Long Term Utility Outage	July 1-2, 2017	Grafton & Coos	Major Disaster Declaration DR-4329: The Federal Emergency Management Agency (FEMA) announced that federal disaster assistance was available to supplement state and local recovery efforts in the areas affected by severe storms and flooding from July 1, 2017, to July 2, 2017, in two New Hampshire Counties. In Enfield, there were some shoulder wash-outs on Lovejoy Brook Road and other roads near Exit 16 (Methodist Hill Road, Eastman Hill Road, Smith Pond Road, Rice Road); Oak Hill Road & Potato Road were also impacted with culvert, road, and shoulder damage. A few homeowners received water in their basements. FEMA provided more than \$50,000 in post-disaster funding.	FEMA & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Inland Flooding (Heavy Rain) Long Term Utility Outage	October 29- November 1, 2017	Sullivan, Grafton, Coos, Carroll, Belknap & Merrimack	Major Disaster Declaration, DR-4355: The Federal Emergency Management Agency (FEMA) announced that federal disaster assistance is available to New Hampshire to supplement state and local recovery efforts in the areas affected by severe storms and flooding from October 29-November 1, 2017, in five New Hampshire Counties. In Enfield, the damage to shoulders and roadways was similar to the July 2017 storm. There were minor power outages and fallen trees, but the damage was less significant than the July storm. FEMA provided post-disaster funding. Trick-or-Treating was canceled in Enfield.	FEMA & 2022 HMPT
Inland Flooding (Heavy Rain)	July 11-12, 2019	Grafton	Major Disaster Declaration, DR 4457: The Federal Emergency Management Agency announced a major disaster declaration during a period of severe storms and flooding from July 11-12, 2019, in one New Hampshire County. In Enfield, there were some shoulder wash-outs on Lovejoy Brook Road and other roads in the area of Exit 16 (Methodist Hill Road, Eastman Hill Road, Smith Pond Road, Rice Road); Oak Hill Road & Potato Road were also impacted with culvert, road and shoulder damage. A few homeowners received water in their basements. FEMA provided \$39,000 in post-disaster funding.	FEMA & 2022 HMPT
B. Wildfires: 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 land exposes these areas to the potential impact of wildfire. Wildfires have the potential to impact the community on a townwide basis. Enfield has had no significant wildfire events since the prior hazard mitigation plan. However, ten wildfires of less than five acres were reported between 2016-2019.				
Summary of wildfire events including Major Disaster & Emergency Declarations in the state and other recent large fires				
Wildfire (Shaw Mountain)	July 2, 1953	Carroll County	Major Disaster Declaration DR-11: This wildfire occurred in Carroll County at Shaw Mountain. This fire did not reach Grafton County or Enfield.	FEMA & 2022 HMPT
Wildfire (Bayle Mountain)	May 2015	Carroll County	The Bayle Mountain Fire: This Class D fire burned 275 acres and took five days to put out on rocky and steep terrain in Ossipee, NH. Blackhawk and private helicopters and fire crews from all over the state assisted in extinguishing this fire. The Bayle Mountain Fire did no damage to homes. This fire did not reach Grafton County or Enfield.	Local Resources
Wildfire (Stoddard)	April 2016	Cheshire County	Fire Management Assistance Declaration, FM-5123: Stoddard, NH. The Stoddard Fire burned 190 acres in April 2016 and caused the evacuation of 17 homes; Class D fire. This fire did not reach Grafton County or Enfield.	FEMA & 2022 HMPT
Wildfire (Covered Bridge Fire)	November 2016	Carroll County	The Covered Bridge Fire: A brush fire near the Albany Covered Bridge grew to 329 acres, primarily on White Mountain National Forest land. No structures were lost; Class E fire. This fire did not reach Grafton County or Enfield.	Local Resources

Type of Event	Date of Event	Location	Description	Source
Wildfire (Dilly Cliff)	October 2017	Grafton County	The Dilly Cliff Fire near the Lost River Gorge Trail in North Woodstock off Route 112 (Lost River Road); Class C: Human-caused; 75 acres. The Dilly Cliff Fire was determined to be extinguished 36 days after it began. This fire did not reach Enfield.	Local Resources
A detailed summary of wildfire events in the community				
Wildfire	2016	Enfield	Three fires, each less than five acres.	2022 HMPT
Wildfire	2017	Enfield	Three fires, each less than five acres.	2022 HMPT
Wildfire	2018	Enfield	Three fires, each less than five acres.	2022 HMPT
Wildfire	2019	Enfield	One fire, less than five acres.	2022 HMPT
C. High Wind Events including Tropical & Post-Tropical Cyclones, Tornadoes, Downbursts & Windstorms: Tornadoes are spawned by thunderstorms and occasionally by hurricanes; tornadoes may occur singularly or in multiples. A downburst is a severe localized wind blasting down from a thunderstorm. Downburst activity is prevalent throughout NH and becoming more common with climate change; most downbursts 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 are real but modest compared to other states in New England. A hurricane that is downgraded to a Tropical Storm is more likely to impact New Hampshire. Tornadoes, cyclones, and other wind events can impact the community on a townwide basis. No significant high wind events have taken place in Enfield since Tropical Storm Sandy in 2012.				
Summary of high wind events & tropical & post-tropical cyclone events, including Major Disaster & Emergency Declarations in the state & regionwide				
Tropical & Post-Tropical Cyclones	1804, 1869, 1938 (Number 4), 1944 (Number 7), 1954 (Carol & Edna), 1960 (Donna), 1976 (Belle), 1978 (Amelia), 1985 (Gloria), 1991 (Bob, DR-917), 1999 (Floyd, DR-1305), 2005 (Katrina, EM-3258), 2011 (Irene, EM-3333 & DR-4026), 2012 (Sandy, EM-3360)			See below
High Wind Events Tornadoes	All were reported as F2 tornadoes except for the June 1953 tornado, an F3. 1814, 1890, 1951, 1953, 1957, 1961, 1963, 2008 (DR-1782)			See below
A detailed summary of high wind & tropical & post-tropical cyclone events in the community				
Tropical & Post-Tropical Cyclone (Great New England Hurricane)	September 21, 1938	All Ten NH Counties	The Great New England Hurricane: Statewide, there were multiple deaths; damages in NH were about \$12.3 million in 1938 dollars (about \$200 million now). Throughout New England, 20,000 structures were damaged, and 26,000 automobiles, 6,000 boats, and 325,000 sugar maples were lost. 80% of the people lost power. Although there was no local recollection, it was expected that in Enfield, the damage would have been similar to the rest of the state. (Source http://nhpr.org/post/75th-anniversary-new-englands-greatest-hurricane)	FEMA & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Tropical & Post-Tropical Cyclone (Hurricanes Carol & Edna)	August 31, 1954	All Ten NH Counties	Hurricanes Carol & Edna: Hurricane Carol resulted in extensive amounts of trees blown down, damage, and significant crop losses. Localized flooding and winds measuring over 100 mph also occurred. Hurricane Carol was followed by Hurricane Edna just 12 days later, which caused already weakened trees to fall. Although there was no local recollection, it was expected that in Enfield, the damage would have been similar to the rest of the state. (Source: http://www.wmur.com/Timeline-History-Of-NH-Hurricanes/11861310)	FEMA & 2022 HMPT
High Wind Events (Tornado)	1998	Enfield	A damage-causing tornado went through the region, including Enfield. Minor tree damage occurred, but the damage was not as significant as it was in other towns.	2022 HMPT
Tropical & Post-Tropical Cyclone (Tropical Storm Floyd)	September 16-18, 1999	Belknap, Cheshire & Grafton	Major Disaster Declaration DR-1305: The declaration covers damage to public property from the storm that spawned heavy rains, high winds, and flooding from September 16-18. Although there was no local recollection, it was expected that in Enfield, the damage would have been similar to the rest of the state.	FEMA & 2022 HMPT
Tropical & Post-Tropical Cyclone (Hurricane Katrina evacuation)	August 29-October 1, 2005	All Ten NH Counties	Emergency Declaration EM-3258: Assistance was provided to evacuees from the area struck by Hurricane Katrina beginning on August 29, 2005, and continuing. The President's action made federal funding available to the state and all 10 New Hampshire counties. No pets or evacuees came to Enfield.	FEMA & 2022 HMPT
High Wind Events (Microburst) Long Term Utility Outage	April 2007	Shaker Hill Road Area	A microburst occurred in the area of Shaker Hill Road. Damage included trees down and long term power outages for multiple days, some up to a week. There was no significant structure damage, but a few houses and cottages had significant damage due to fallen trees. The shelter and the EOC were both open and used for this event.	2015 HMPT & 2022 HMPT
Tropical & Post-Tropical Cyclone (Tropical Storm Irene)	August 26-September 6, 2011	EM 3333: All Ten NH Counties DR-4026: Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	Major Disaster Declaration DR-4026 & Emergency Declaration EM-3333: Tropical Storm Irene, August 26th-September 6, 2011, occurred in seven New Hampshire counties causing flood and wind damage. In addition, an Emergency Declaration was declared for all ten New Hampshire counties. Enfield had \$50,000 in damage with \$25,000 in the Methodist Hill Road area of town. Enfield was not affected as severely as other towns. The EOC was open, and there were some road closures for fallen trees. Lovejoy Brook was high, creating some washing on roads; the town got money for repairs. Shaker Boulevard Bridge over Knox River washed out and replaced with a temporary bridge with FEMA money.	FEMA, 2015 HMPT & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Tropical & Post-Tropical Cyclone (Hurricane Sandy)	October 26-November 8, 2012	DR-4095: Belknap, Carroll, Coos, Grafton, Rockingham & Sullivan EM-3360: All Ten NH Counties	Major Disaster Declaration DR-4095 & Emergency Declaration EM-3360: The declaration covers damage to property from the storm that spawned heavy rains, high winds, high tides, and flooding from October 26-November 8, 2012. Hurricane Sandy came ashore in NJ and brought high winds, power outages, and heavy rain to six New Hampshire counties. In Enfield, there were minor winds and heavy rain.	FEMA & 2022 HMPT
D. Severe Winter Weather including Nor'easters, Blizzards & Ice Storms: Severe winter weather in NH may include heavy snowstorms, blizzards, nor'easters, and ice storms, particularly at elevations over 1,000 feet above sea level. Generally speaking, NH will experience at least one of these hazards during any winter season; however, most NH communities are well prepared for such hazards. Severe winter weather and ice storms can impact the community on a townwide basis. Since the previous hazard mitigation plan, Enfield has had no significant winter weather events.				
Summary of severe winter weather events including Major Disaster & Emergency Declarations in the state & nationwide				
Severe Winter Weather (Ice Storms)	Major ice storms have occurred, causing significant disruptions to power, transportation, public and private utilities. 1942, 1969, 1970, 1979, 1991, 1998 (DR-1199), 2008 (DR-1812)			FEMA & 2022 HMPT
Severe Winter Weather (Snowstorms)	Major severe winter weather events marked by snowfalls exceeding 2' in parts of the state resulted in power and transportation systems disruptions. 1920, 1929, 1940, 1950, 1952, 1958 (2), 1960, 1961, 1969, 1978, 1982, 1993 (EM-3101), 2001 (EM-3166), 2003 (EM-3177), 2003 (EM-3193), 2004, 2005 (EM-3207), 2005 (EM-3208), 2005 (EM-3211), 2008 (EM-3297), 2009, 2011 (EM-3344 & DR-4049), 2013 (EM-1405), 2015 (DR-4209), 2017 (DR-4316), 2018 (DR-4371)			FEMA & 2022 HMPT
A detailed summary of severe winter storm events in the community				
Severe Winter Weather (Snowstorm)	Winter of 1968-69	All Ten NH Counties	The winter of 1968-69 brought record amounts of snow to all New Hampshire. Pinkham Notch at the base of Mount Washington recorded more than 75" of snowfall in four days at the end of February 1969 in addition to snow that had already fallen in previous storms. All of NH experienced difficulty with snow removal because of the great depths that had fallen from December 1968 to April 1969. There was no recollection of events in Enfield; however, it is expected that snow amounts in Enfield were similar to accumulation in the rest of the state. The DPW handled the heavy snow accumulation in Enfield.	2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Severe Winter Weather (High Winds, Coastal Flooding & Snowstorm)	February 16, 1978	All Ten NH Counties	Major Disaster Declaration DR-549: The Blizzard of '78, a regionwide blizzard severely affecting southern New England, resulted in high snow accumulations throughout New England and New Hampshire. Recorded accumulations show up to 28" in northeast New Hampshire, 25" in west-central New Hampshire, and 33" along coastal New Hampshire. This storm also brought hurricane-force winds, which made this storm one of the more intense to occur this century across the northeastern United States. There was no recollection of events in Enfield; however, it is expected that snow amounts in Enfield were similar to accumulation in the rest of the state. The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm & High Winds)	March 13-17, 1994	All Ten NH Counties	Emergency Declaration EM-3101: The heavy snow accumulation in Enfield was handled by the DPW.	FEMA & 2022 HMPT
Severe Winter Weather (Ice Storm) Long Term Utility Outage	January 7-25, 1998	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Strafford & Sullivan	Major Disaster Declaration DR-1199: A significant ice storm struck nearly every part of the state with a more significant impact in northern communities and areas over 1,000 feet above sea level. In Enfield, this storm caused tree damage to higher elevations, power was out for up to five days in some locations, and some structural damage from trees falling on homes occurred. Severe tree damage closed the road to New London; tree damage was significant.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm)	March 5-7, 2001	Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Strafford	Emergency Declaration EM-3166: The emergency declaration covers jurisdictions with record and near-record snowfall from a late winter storm in March 2001 and affected six New Hampshire counties. The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm)	December 6-7, 2003	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan	Emergency Declaration EM-3193: The emergency declaration covers jurisdictions with record and near-record snowfall from December 6-7, 2003, and affected eight New Hampshire counties. The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Severe Winter Weather (Snowstorms)	January 22-23, 2005 February 10-11, 2005 March 11-12, 2005	EM-3208-002 (Jan, Feb & Mar): All Ten NH Counties EM-3207 (Jan): Nine NH Counties EM-3208 (Feb): Five NH Counties EM-3211 (Mar): Five NH Counties	Emergency Declaration 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 snowstorms that hit the state in 2005. The total aid for all three storms was \$6,892,023 (January: \$3,658,114; February: \$1,121,727; March: \$2,113,182). Emergency Declaration EM-3207: The January storm (Grafton: \$137,118; State of NH: \$1,107,426); Emergency Declaration EM-3208: The February storm (Grafton: \$213,539; State of NH: \$521,536). Emergency Declaration EM-3211: The March storm (Not declared in Grafton County; State of NH: \$697,501). The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm & Ice Storm)	December 11-23, 2008	All Ten NH Counties	Major Disaster Declaration DR-1812 & Emergency Declaration EM-3297: Damaging ice storm impacted the entire state, including all 10 New Hampshire counties resulting in fallen trees and large-scale power outages. Nearly \$15 million in federal aid was obligated by May 2009. There was no recollection of damage in Enfield from this storm. The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm)	February 23 - March 3, 2010	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Major Disaster Declaration: DR-1892: Flood and wind damage occurred in southern NH, including six counties resulting in 330,000 homes without power. More than \$2 million was obligated by FEMA by June 2010. The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm)	October 29-30, 2011	DR-4049: Hillsborough & Rockingham EM-3344: All Ten NH Counties	Major Disaster Declaration DR-4049 & Emergency Declaration EM-3344: A severe winter storm occurred in two New Hampshire counties on October 29-30, 2011. EM-3344: The emergency declaration for snow removal and damage repair included all ten NH countries (Snowtober). The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT
Severe Winter Weather (Snowstorm)	February 8, 2013	All Ten NH Counties	Major Disaster Declaration DR-4105: Severe winter storm resulted in heavy snow in February 2013 in all ten New Hampshire counties (Nemo). The DPW handled the heavy snow accumulation in Enfield.	FEMA & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
E. Earthquakes: According to the NH State Hazard Mitigation Plan, New Hampshire lies in an area of "Moderate" seismic activity compared to other areas of the United States. "Major" activity areas border new Hampshire to the north and southwest. Generally, earthquakes in NH cause little or no damage and have not exceeded a magnitude of 5.5 since 1940. Earthquakes have the potential to impact the community on a townwide basis. No significant earthquakes have occurred in Enfield since the previous hazard mitigation plan.				
Summary of earthquakes with a magnitude of 4.0 or greater in the state & regionwide				
Earthquakes	Earthquakes with a magnitude of 4.0 or greater on record in New Hampshire History. 6/11/1638 (Central NH, 6.5), 10/29/1727 (Off Coastline, 6.0-6.3), 11/18/1755 (Off Coastline, 5.8), 11/10/1810 (Portsmouth, NH, 4.0), 7/23/1823 (Off Hampton, NH, 4.1), 12/19/1882 (Concord, NH, Unknown), 3/5/1905 (Lebanon, NH, Unknown), 8/30/1905 (Rockingham County, Unknown), 11/09/1925 (Ossipee, NH, 4.0), 3/18/1926 (New Ipswich, NH, Unknown), 11/10/1936 (Laconia, NH, Unknown), 12/20/1940 (Ossipee, NH, 5.5-5.8), 12/24/40 (Ossipee, NH, 5.5-5.8), 1/19/1982 (Laconia, NH, 4.0), 11/20/1988 (Berlin, NH, 4.0), 4/6/1989 (Berlin, NH, 4.1), 10/16/2012 (Hollis Center, ME, 4.0)			State of NH Multi-Hazard Mitigation Plan, Update 2018
A detailed summary of earthquakes that have been felt in the NH since 1940 with a magnitude of 3.0 or greater				
Earthquake	December 20, 1940	Ossipee, NH	Magnitude 5.5	State of NH Multi-Hazard Mitigation Plan, Update 2018, 2015 HMPT & 2022 HMPT
Earthquake	December 24, 1940	Ossipee, NH	Magnitude 5.5	
Earthquake	June 15, 1973	Quebec Border / NH	Magnitude 4.8	
Earthquake	January 18, 1982	Franklin, NH	Magnitude 4.5	
Earthquake	November 20, 1988	Berlin, NH	Magnitude 4.0	
Earthquake	April 6, 1989	Berlin, NH	Magnitude 4.1	
Earthquake	April 20, 2002	Plattsburg, NY	Magnitude 5.1	
Earthquake	June 23, 2010	Ontario-Quebec Border	Magnitude 5.0	
Earthquake	September 26, 2010	Boscawen, NH	Magnitude 3.1; the Committee recalls feeling the earthquake (2015 HMPT)	
Earthquake	October 16, 2012	Hollis Center, ME	Magnitude 4.0; there was no damage or recollection of this earthquake being felt in Enfield	

Type of Event	Date of Event	Location	Description	Source
F. Drought: Drought is generally not as damaging or disruptive as floods and other hazards, and it is more challenging 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. According to the NH State Hazard Mitigation Plan, New Hampshire has a low probability, severity, and overall risk for drought. Droughts have the potential to impact the community on a townwide basis. Enfield remained in drought condition through 2020 and 2021.				
Summary of drought in the state & regionwide				
Drought	1775, 1840, 1882, 1910's, 1929-1936, 1939-1944, 1947-1950, 1960-1969, 1999; 2001-2002, 2016-2017, 2020-2021		Occurrences of serious droughts in recorded New Hampshire history.	State of NH Multi-Hazard Mitigation Plan, Update 2018
Summary of drought in the community since 1929				
Drought	1929-1936	Statewide	Regional	State of NH Multi-Hazard Mitigation Plan, Update 2018 & 2022 HMPT
Drought	1939-1944	Statewide	Severe in the southeast and moderate elsewhere	
Drought	1947-1950	Statewide	Moderate	
Drought	1960-1969	Statewide	Regional longest recorded continuous spell of less than average precipitation	
Drought	2001-2002	Statewide	The third worst drought on record	
Drought	2016-2017	Statewide	Declared drought for the summer of 2016 and into 2017, moderating from extreme in southern New Hampshire to dry in the most northern communities. The drought affected Enfield, but there were no reported lost wells.	
Drought	2020-2021	Statewide	Some wells went dry, with mandatory restrictions on outdoor water use as of 9/13/2020). Some water drafting sites for fire suppression are getting low.	
G. Miscellaneous Past or Potential Hazards: Natural, technological, and human-caused hazards and other unusual hazardous events have been noted throughout New Hampshire. One concern is transporting hazardous material through communities by rail and tractor-trailer; however, other natural, technological, or human-caused hazards can impact the community on a townwide basis. Covid-19 is currently ongoing in Enfield and the world.				
Infectious Disease	January 20, 2020 – ongoing	All Ten NH Counties	Major Disaster Declaration, DR-4516: The Federal Emergency Management Agency ("FEMA") within the US Department of Homeland Security is giving public notice of its intent to assist the State of New Hampshire, local and tribal governments, and certain private nonprofit organizations under the major disaster declaration issued by the President on April 3, 2020, as a result of the Coronavirus Disease 2019 ("COVID-19").	FEMA & 2022 HMPT
Infectious Disease	January 20, 2020 – ongoing	All Ten NH Counties	Emergency Declaration EM-3445: Ten county declaration to provide individual assistance and public assistance due to the impact of COVID-19.	FEMA & 2022 HMPT

Type of Event	Date of Event	Location	Description	Source
Landslide & Erosion	2005	Mascoma River @ Oak Grove Street	A large portion of the riverbank slid into the Mascoma River. The bank in this area is around 30-40 feet high. The issue has been mitigated with rip rap; however, sections of the bank are still at risk for a landslide. Oak Grove Street was closed for 1-2 weeks.	2022 HMPT
Landslide & Erosion Long Term Utility Outage	2005	Mascoma Lake on Route 4A	A landslide slid into Mascoma Lake on NH Route 4A. The landslide caused erosion damage, mostly on roads, road closures, and a few lakefront houses lost power for almost three days. The issue has been mitigated with rip rap; however, the bank's lengths are still at risk for a landslide.	2022 HMPT
Transport Accidents	2018	I-89 North	A major chemical spill of industrial glue occurred on I-89 North. The spill occurred from Exit 15 to Exit 16 and the exit ramp to the truck stop. DES was called, and Clean Harbors managed the cleanup.	2022 HMPT

H. Other Hazards: Identified hazards with no specific example of occurrence.

Natural Hazards	<p>Although the team did not identify specific examples or past occurrences of these hazards, it was felt worthwhile to list them as potential hazards to the town. These hazards can potentially impact the community either locally or townwide.</p> <p>See <i>Table 3.1, Hazard Threat Analysis</i>, and Chapter 5 for more details on these hazards.</p>
Lightning	
Technological Hazards	
Aging Infrastructure	
Dam Failure	
Hazardous Materials	
Conflagration	
Human-caused	
Mass Casualty Incidents	
Terrorism & Violence	
Cyber Events	

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>
- EarthquakeTrack.com; <http://www.EarthquakeTrack.com>

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

Chapter 4: Critical Infrastructure & Key Resources (CIKR)

Team discussion and brainstorming identified Enfield's critical Infrastructure & Key Resources (CIKR). 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 ROUTES

EMERGENCY RESPONSE FACILITIES (ERF)			
ERFs are primary facilities and resources that may be needed during an emergency response.			
Facility	Type of Facility	Hazard Risk	
Police Station (generator)	Police Department & Primary EOC	All Hazards	1
Fire Station (Union Street) (small generator)	Fire Department	All Hazards	1
Fire Department (Enfield Center) (large portable generator)	Fire Department	All Hazards	1
Department of Public Works (generator)	Heavy Equipment, Sand, Gravel; Secondary EOC; Potential Shelter; Diesel & Gas (town vehicles)	All Hazards	1
Enfield Town Hall (generator)	Continuity of Government; Town Records	All Hazards	1
Enfield Community Building (wired for generator)	Primary Shelter	All Hazards	1
Enfield Fast Squad (no generator)	Emergency Medical Services	All Hazards	1
Enfield Village School (no generator)	Secondary Shelter	All Hazards	1
Whaleback Mountain Tower	Communications Tower	All Hazards	1
Follansbee Tower (generator pending)	Communications Tower	All Hazards	1
Snow Mountain Tower (generator)	Cell Tower	All Hazards	1
Mascoma Health Care (Canaan)	Medical Facility	All Hazards	1
Dartmouth-Hitchcock Hospital (Lebanon)	Medical Facility	All Hazards	1
Evacuation Routes			
Interstate 89	Primary Evacuation Route	All Hazards	1
US Route 4	Primary Evacuation Route	All Hazards & Inland Flooding	2
NH Route 4A	Primary Evacuation Route	All Hazards	1
Bridges & Culverts on the Evacuation Routes			
Eastman Hill Road over I89N	Bridge on Evacuation Route	All Hazards & Transport Incident	1
Eastman Hill Road over I89S	Bridge on Evacuation Route	All Hazards & Transport Incident	1
Interstate 89N over Smith Pond Road	Bridge on Evacuation Route	All Hazards & Transport Incident	1
Interstate 89S over Smith Pond Road	Bridge on Evacuation Route	All Hazards & Transport Incident	1

EMERGENCY RESPONSE FACILITIES (ERF)			
ERFs are primary facilities and resources that may be needed during an emergency response.			
Facility	Type of Facility	Hazard Risk	
Route 4 over Lovejoy Brook	Bridge on Evacuation Route	All Hazards & Transport Incident	1
Route 4 over Harris Brook (near Baltic Street)	Bridge on Evacuation Route	All Hazards, Inland Flooding & Transport Incident	2
Dams			
George Pond Dam @ Knox River	High Hazard (in good shape, water only 3-4 feet deep; only maybe affect some gardens, shouldn't be a high hazard)	All Hazards & Inland Flooding	1
Smith Pond Dam @ Smith Pond Brook	High Hazard (recently rehabbed within last five years)	All Hazards & Inland Flooding	3
Crystal Lake Dam @ Crystal Lake Brook	Significant Hazard (pressure on Mascoma Lake could be impactful; no residents, more forest land)	All Hazards & Inland Flooding	1
Baltic Mills Dam @ Mascoma River	Low Hazard	All Hazards & Inland Flooding	1
Montcalm Golf Club Dam @TR Stony Brook	Low Hazard	All Hazards & Inland Flooding	1
Smith Pond Dam near East Dike @ Smith Pond Brook	Low Hazard	All Hazards & Inland Flooding	1

TABLE 4.2 – NON-EMERGENCY RESPONSE FACILITIES (NERF)

NON-EMERGENCY RESPONSE FACILITIES (NERF)			
NERFs are facilities that, although critical, are not necessary for immediate emergency response efforts. NERFs would include facilities to protect public health and safety and provide backup emergency facilities.			
Facility	Type of Facility	Hazard Risk	
Municipal Water Tank	Water Supply	All Hazards	1
Transfer Station	Waste Disposal	All Hazards	1
Pump Station-Shaker Bridge	Sewer Pumping Station	All Hazards	1
Pump Station-Wells Street Lift Station	Sewer Pumping Station	All Hazards	1
Pump Station-Lower Shaker Village	Sewer Pumping Station	All Hazards	1
Pump Station-Route 4A Lift Station	Sewer Pumping Station	All Hazards	1
Municipal Wells (Prior (family) wells 1 & 2)	Water Supply	All Hazards	1
Municipal Wells McConnell	Water Supply	All Hazards	1
Municipal Wells Marsh (Canaan)	Water Supply	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 residents who may need help during a hazardous event.			
Facility	Type of Facility	Hazard Risk	
Prospect Pines Senior Housing	Gathering of People	All Hazards	1
Childcare Facilities	Gathering of People	All Hazards	1
Churches	Gathering of People	All Hazards	1
Enfield Village School (no generator)	Secondary Shelter	All Hazards	1
Wilson's Mobile Home Park	Gathering of People	All Hazards	1
Lakeside Mobile Home Park	Gathering of People	All Hazards	1
Stickney House	Historic (State Register)	All Hazards	1
JP Washburne House	Historic (State Register)	All Hazards	1
Woodbury House	Historic (State Register)	All Hazards	1
Francis H. Well House	Historic (State Register)	All Hazards	1
Duplex	Historic (State Register)	All Hazards	1
North Enfield Universalist Meeting House	Historic (State Register)	All Hazards	1
Centre Village Meeting House	Historic (National Register)	All Hazards	1
Enfield Center Town House	Historic (National Register)	All Hazards	1
Enfield Shaker Historic District	Historic (National Register)	All Hazards	1
Enfield Village Historic District	Historic (National Register)	All Hazards & Flooding	1
Hewitt House	Historic (National Register)	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.
Please refer to the Resource Inventory List in the Enfield Emergency Operations Plan for additional resources.

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Chapter 5: Hazard Effects in Enfield

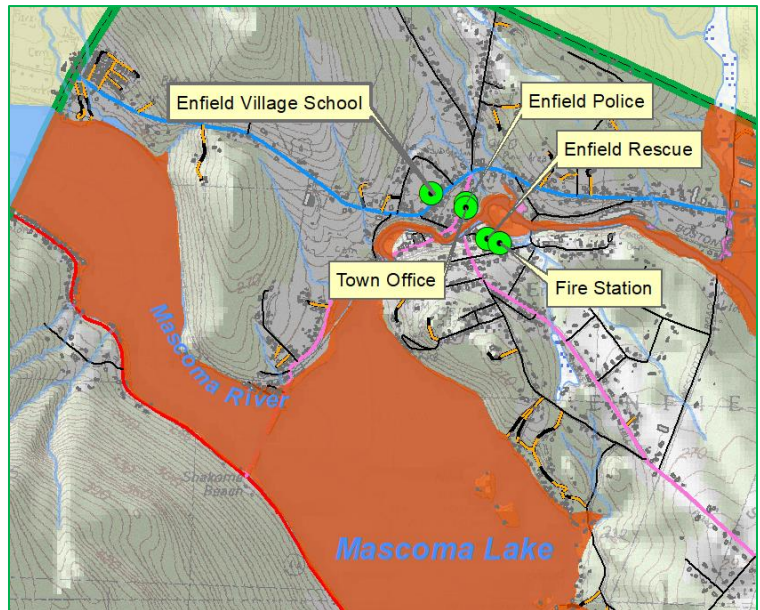
A. IDENTIFYING VULNERABLE CRITICAL INFRASTRUCTURE & KEY RESOURCES (CIKR)

Because damages from floods and wildfires are more predictable than damages from other disasters, it is essential to identify the Critical Infrastructure & Key Resources (CIKR) that are most likely to be damaged by these events.

Overall Flood Risk

Enfield's CIKR were identified and listed in Chapter 4; each CIKR was analyzed for its flooding potential. This analysis and the GIS map snip to the right indicate the floodplain along the Mascoma River traveling through Enfield Village. The town's CIKR, including several not shown in the map snip (green circles), are not in the FEMA floodplain. Please refer to Chapter 4, Tables 4.1-4.4, and Section D, Dam Failure, in this chapter for more information.

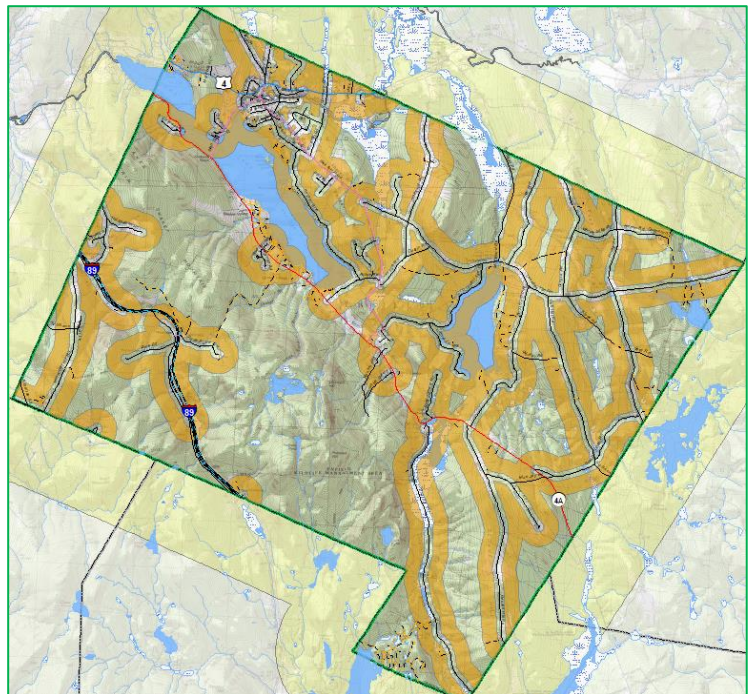
All other CIKR are outside the flood zone except for a few culverts and bridges on the evacuation routes. It is expected that there may be other structures and homes within the flood zone. Town officials should keep all at-risk properties in mind when a flood hazard is likely.



Overall Wildfire Risk

Using the same methodology used for flooding, CIKR falling within the Wildland Urban Interface (WUI) were reviewed. Identifying these facilities helped the team create and prioritize wildfire mitigation action items.

Traditionally, the WUI is determined using GIS analysis to create a 300' buffer from the centerline of all Class V roads and an additional 1,320' buffer from the first buffer. The orange symbology in the map snip to the right shows the traditional WUI in Enfield. This area is where the urban environment interfaces with the wildland environment and is the most prone to wildfire risk.



The traditional WUI was initially developed to identify human-interface areas that may exceed the typical length of fire hoses. In rural communities, this would virtually cover the entire town. A different method to determine the WUI in suburban communities includes identifying developments, streets, roads with limited egress, a high canopy of old-growth softwoods, or older wooden structures.

None of Enfield's critical facilities were found in the WUI; the primary facilities are within the 300' WUI buffer of roadways, therefore easily accessible by fire apparatus and hoses. Most of the town's CIKR also have adequate defensible space.

No facilities were identified in Table 4.3 as having a high risk for wildfires. However, it is expected that many additional structures in Enfield would be prone to wildfires, particularly in neighborhoods with limited egress and a canopy of old-growth trees or where forests completely surround structures. Because Enfield is so forested, it can be assumed that nearly every structure in town is within the Wildland Urban Interface. Mitigation strategies were discussed to protect structures and educate the citizens about the wildfire risk.

B. CALCULATING THE POTENTIAL LOSS

It is difficult to determine the damage caused by hazards because the damage will depend on the hazard's extent and severity, making each hazard event unique. Therefore, we have assumed that hazards could damage 0-1% or 1-5% of the town's structures. Structure damage depends on the nature of the hazard and whether or not the impact is localized.

MS-1 Assessed Valley of all Structures			
2021-MS1	Value	1% Damage	5% Damage
Residential	\$304,850,400	\$3,048,504	\$15,242,520
Manufactured Housing	\$14,395,000	\$143,950	\$719,750
Commercial	\$32,187,300	\$321,873	\$1,609,365
Tax Exempt	\$16,038,400	\$160,384	\$801,920
Utilities	\$9,944,200	\$99,442	\$497,210
Totals	\$377,415,300	\$3,774,153	\$18,870,765

This plan assumes that the potential loss from the identified natural hazards would range from **\$0 to \$3,774,153** or **\$3,774,153 to \$18,870,765**, based on the 2021 MS1 total structure value of **\$377,415,300**. (See chart above)

Human loss of life was not included in the potential loss estimates but could be expected to occur depending on the hazard's severity and type. Although descriptions are given for technological and human-caused hazards, no potential loss estimates for these hazards are provided in this plan.

C. NATURAL HAZARDS

The descriptions below represent the “**local impact**” to the community for the hazards that were identified by the team. The “**extent**” of these hazards is shown in *Appendix C, The Extent of Hazards*. 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 Enhanced Fujita Scale for tornadoes are included in Appendix C.

The “Hazard Identification & Risk Assessment (HIRA)” and the “Probability” noted for each hazard below are taken from analysis done in Table 3.1, *Hazard Identification & Risk Assessment (HIRA)*. The numbers preceding the hazard name in this section correspond to Table 3.1 and are ordered by “Relative Threat”. The estimated loss is determined using the methodology and table, as explained in Section B of this chapter.

Table 3.1, The Hazard Identification & Risk Assessment (HIRA), is used to evaluate the probability and the potential impact of all hazards.

1) SEVERE WINTER WEATHER

Hazard Identification & Risk Assessment (HIRA)	High
Probability	Very High
Estimated Structure Loss Value	\$3,774,153 to \$18,870,765

Snowstorms, Blizzards & Nor'easters

Heavy snowstorms typically occur from December through April. New England usually experiences at least one or two heavy snowstorms with varying degrees of severity each year. Power outages, extreme cold, and impacts on infrastructure are all effects of winter storms felt in Enfield in the past. These impacts are a risk to the community, including isolation, especially of the elderly (20.6%) and other vulnerable populations. In addition, the ability to get in and out of town and emergency service access can be hindered.

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. Significant snowstorms, nor'easters, and blizzards could diminish food supplies within two days.

As shown in Table 3.2, many significant snowstorms and nor'easters have struck Enfield and Grafton County in the past, but the Department of Public Works has been able to keep up with the accumulation. More recently, in March 2017 and March 2018, snowstorms with unusually high spring accumulation received Major Disaster Declarations (DR-4316 and DR-4371). In both cases, the disaster declarations were not issued for Grafton County, but heavy snow fell throughout the state. In Enfield, as expected, the Department of Public Works (DPW) handled the snow accumulation, and Town Meeting was held as planned. In some communities, the scheduled Town Meetings and voting were delayed.

Enfield's Department of Public Works generally handles usual snow amounts without difficulty; however, the DPW reported that in more recent years, rain and freezing rain have become more prevalent than high-accumulation snowstorms, particularly at higher elevations. The DPW also reported that they had used more sand in recent years, and they have four or five micro-mud seasons, with repeated freezing and thawing. Whether the event brings heavy snow, freezing rain, or sleet, these factors combined with traffic on Interstate 89, US Route 4, and NH Route 4A make travel difficult. Poor road conditions may also hinder fire and other emergency responders.

Ice Storms

More concerning than 2-4' snowstorms are ice storms, though the probability of a significant ice storm is lower than that of a significant snowstorm. An ice storm can inflict several million dollars of damage to forests and structures. Unlike typical snowstorms, which are generally handled well by the Department of Public Works, ice storms present significant problems. Downed power lines and fallen trees make it difficult for the highway crew and emergency responders. School buses are also at risk.

Three significant ice storms have occurred in New Hampshire in the past 25 years. The first occurring in January 1998 caused tree damage at higher elevations and power loss for some Enfield residents for as many as five days. There was also some damage to a few houses due to trees and limbs falling. The 1998 ice storm was particularly impactful in Northern NH, Maine, and Quebec. Fortunately, the second and third ice storms, 2008 (DR-1812) and 2010 (DR-1892) had little or no impact on Enfield.

Since the last hazard mitigation plan, no damaging or debilitating winter storm events have occurred in Enfield. However, due to the widespread nature of severe winter weather, particularly from ice storms, the potential loss value is estimated to be between 1% and 5% of the total assessed value of all structures in town.

2) INLAND FLOODING

Hazard Identification & Risk Assessment (HIRA) High
Probability Very High
Estimated Structure Loss Value \$3,774,153 to \$18,870,765

100-Year Flood Events, Riverine Flooding & Local Road Flooding

Riverine flooding and 100-year flood events can occur due to hurricanes, tropical and post-tropical cyclones, and summer and fall rains. Local road flooding is often the result of rapid snowmelt combined with heavy rain events. Rain from tropical downpours, hurricanes, or severe thunderstorms can also cause culverts to be overwhelmed and roads to wash out. Additionally, timber harvesting, undersized or aging culverts, and inadequate ditching are significant causes of local road flooding.

Nearly every spring, rapid snowmelt, and heavy rain cause a rise in Enfield's rivers. Based on the Grafton County Floodplain Map, Enfield has a relatively small floodplain, running primarily along the Mascoma River, the Knox River, Crystal Lake Brook, Bicknell Brook, Moose Brook, Gulf Brook, and Little Brook. The flood zone also extends to swampy areas near the Canaan boundary and around Enfield's lakes.

Since the previous hazard mitigation plan, three extraordinary rain events significantly impacted Enfield. On July 1-2, 2017 (DR-4329), there were shoulder wash-outs on Lovejoy Brook Road and other roads in the area of Exit 16 (Methodist Hill, Eastman Hill, Smith Pond, and Rice Roads); Oak Hill Road & Potato Road were also impacted with culvert, road and shoulder damage. A few homeowners received water in their basements. FEMA provided more than \$50,000 in post-disaster funding. This disaster declaration was only declared in Grafton and Coos Counties.

The second significant rain event occurred in six NH counties, including Grafton, on October 29-30, 2017 (DR-4355). In Enfield, the damage to shoulders and roadways was similar to the July 2017 storm, but high winds during this storm caused minor power outages and significant tree clean-up. Overall, the damage in October was less significant than in July. FEMA provided post-disaster funding for this event.

The third disaster declaration (DR-4457) was declared in just Grafton County for July 11-12, 2019. In Enfield, there were some shoulder wash-outs and major damage to Potato Road with the failure of two undersized culverts. Additional damage occurred on Follensbee and Fuller Roads. FEMA provided \$39,000 in post-disaster funding.

The flooding, washouts, and erosion of roads make for a daunting task of up-keep for the Department of Public Works, which maintains approximately 33 miles of paved roads, 33 miles of gravel roads, and 500 culverts. Fortunately, Enfield's main thoroughfares, Interstate 89, US Route 4, and NH Route 4A, are the state's responsibility along with Shaker Hill Road and Main Street. While staying within its budget, the DPW has been and continues to be proactive in the maintenance and repairs of culverts and has reduced the incidence of local road erosion and washouts.

The expected loss value from inland flooding would be based on the cost to repair roadways and the potential cost of damage to structures. Flooding can be severe enough to take out utilities and create areas of town that become inaccessible to emergency responders. The economic impact on the community, the loss of accessibility, and the time and cost of road repair also factor into the estimated loss value. Therefore, the estimated loss value was determined to be between 1% and 5% of the total structure value.

3) EXTREME TEMPERATURES

Hazard Identification & Risk Assessment (HIRA) Medium
 Probability Very High
 Estimated Structure Loss Value Not estimated

Extreme Cold & Heat

Winter temperatures can fall below -30°F, and summer temperatures, laden with high humidity, can soar to nearly 100°F. There was more concern about cold temperatures in the past, but with improved heating systems and local communications, most New Hampshire residents can cope with extreme cold. Additionally, many New Hampshire residents have equipped their homes with generators and woodstoves. Many cities and towns offer warming centers or have established a functional needs list to check vulnerable citizens. The Community Center has been designated for use during extreme temperatures.

More concerning today is extreme heat conditions, which seem to be more likely with climate change; temperatures above 95° for a week or more can impact the elderly and other vulnerable populations. Few residents, particularly vulnerable populations, have air conditioners and are less able to cope with extreme heat. The estimated elderly population in Enfield is 20.6%, and the estimated poverty rate is 4.0% of the total population¹⁶. These vulnerable populations have a more difficult time coping with extreme temperatures.

Extreme Temperatures combined with Long Term Utility Outage

When combined with power failure, extreme temperatures are of the most concern; power failure could result in no water, heat, and air conditioning for the town's most vulnerable populations. Town officials and the community as a whole should be concerned; they should look after their citizens to ensure that extreme temperatures do not create a life or property-threatening disaster. Social media platforms maintained by several town departments provide warnings and recommendations regarding extreme temperatures if needed.

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

¹⁶ US Census Bureau, American Community Survey, ACS, 2015-2019

4) HIGH WIND EVENTS

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
Estimated Structure Loss Value	\$3,774,153 to \$18,870,765

Isolated High Wind Events

Isolated high winds and downdrafts are likely to occur in Enfield. These unpredictable wind events could fall timber, down power lines, and impair emergency response. Old-growth softwood is often affected by these unexpected windstorms, particularly in the spring, when the water table is high.

The team noted that high winds often occur throughout the community, but no particular area was more susceptible than others. The team also noted that Eversource, Liberty Utilities, and the NH Electric Coop, in cooperation with companies like Asplundh, have substantially increased their trimming efforts in recent years. In coordination with the utility companies, the Department of Public Works removes downed trees to aid in the reparation of power lines.

Tornadoes & Downbursts (microbursts & macrobursts)

The most significant difference between tornadoes and downbursts, also known as microbursts and macrobursts, is the size and direction from which the wind comes; all winds of these types can cause significant damage.

A tornado generally covers a large area, perhaps even several miles. It has winds that blow in a circular fashion leaving behind downed trees lying in a swirling pattern. Straight-line winds and winds that burst downward indicate a microburst; the fallen trees 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 more than 2.5 miles wide and lasting longer than a microburst. Like high winds, the effects would be primarily power outages and blowdowns; however, if a tornado, microburst, or macroburst were severe enough, property damage could also occur.

Like high winds, the effects of downbursts would be primarily power outages and blowdowns; however, if a tornado, microburst, or macroburst were severe enough, property damage could also occur. In Enfield, a microburst would be more likely than a tornado. Since the previous hazard mitigation plan, there have been no reports of tornadoes or downbursts; however, the team reported a micro-burst in 2007 that affected Shaker Hill Road.

Although downbursts are becoming more common, damaging high wind events are rare natural hazards in New Hampshire. Damage from high wind events largely depends on where the hazard strikes. If a high wind event strikes a densely populated or commercial area, the impact could be significant and result in personal injury, property damage, and economic hardship. Based on the potential devastation from tornadoes, macrobursts, or microbursts, the potential loss value was estimated to be between 1% and 5% of the total structure value.

5) LIGHTNING & HAIL

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
Estimated Structure Loss Value	\$0 to \$3,774,153

Lightning

Lightning strikes have occurred in Enfield as a result of severe summer storms. Some of the town's structures are older and historic buildings, as detailed in Table 4.3. Forests surround other vulnerable structures. Dry timber on the forest floor, some of which remains from past ice or windstorms and the age of many buildings and out-buildings combined with lightning strikes, can pose a significant disaster threat. Lightning could damage specific structures, but the direct damage would not be widespread.

Although lightning is a potential problem, the town reports few occurrences, none of which were significant. It was noted that severe thunder and lightning storms seem to happen more often in recent years, perhaps due to climate change.

Hail

Although not common in Enfield, hailstorm events resulting from significant thunder and lightning storms can occur at any time. Summer storms may produce hail large enough to damage roofs, siding, and automobiles. Damage from hail could also result in failed crops, thus creating an economic impact on the local economy and individual citizens. However, it should be noted that Enfield is not a heavily farmed community. Overall, it was felt that a hailstorm event would be unlikely and would cause minimal damage.

Since the last hazard mitigation plan, no significant lightning or hail events have occurred in Enfield. Based on the history of lightning strikes, their localized nature, and the minimal damage expected from hail, the potential loss value was determined to be 0% and 1% of the total assessed structure value.

6) LANDSLIDE & EROSION

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
Estimated Structure Loss Value	\$0 to \$3,774,153

Landslides and erosion are often associated with heavy rains, steep terrain, and the overflow of riverbanks. Landslides often occur where unstable slopes threaten to collapse on homes, buildings, and roads. Erosion and the subsequent loss of land along the river banks, road washouts, overburdened culverts, and changes in the course of rivers could also occur. Enfield experiences erosion of the Mascoma River riverbank and other smaller rivers whenever there is a significant change in the water level.

In 2005 a large portion of the riverbank along Oak Grove Street fell into the Mascoma River; this 30-40' high riverbank has been mitigated with rip rap and is not currently a hazard. At the time, Oak Grove Street was closed for repairs for one to two weeks. Also, in 2005, land slid into Mascoma Lake across NH Route 4A, causing erosive road damage and a loss of power for a few homes on the waterfront. Like Oak Grove Street, this issue was mitigated with rip rap and is no longer a hazard.

The Enfield planning team reported that other parts of the Mascoma River riverbank and the shorefronts of Enfield's lakes could be susceptible to erosion and landslides; a loss of physical property (land) is possible for a few homes. However, most of Enfield's landslide erosion concerns are with the damage to roads caused by flooding events.

Although landslides and erosion are issues, no structures appear to be in harm's way at this time. In the unlikelihood that structure loss would be experienced, it would be localized; therefore, the structure loss value was estimated to be between 0% and 1% of the total assessed structure value. Refer to Inland Flooding in this chapter for more information on road erosion.

7) INFECTIOUS DISEASES

Hazard Identification & Risk Assessment (HIRA)	Low
Probability	Low
Estimated Structure Loss Value	Not estimated

“Infectious diseases are disorders caused by organisms — such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful, but under certain conditions, some organisms may cause disease.

Some infectious diseases can be passed from person to person. Some are transmitted by bites from insects or animals. And others are acquired by ingesting contaminated food or water or being exposed to organisms in the environment.”¹⁷

Infectious diseases and epidemics or pandemics present a possible threat to Enfield. Enfield is susceptible to an epidemic and subsequent quarantine with worldwide pandemics such as Covid-19, SARS, the Zika Virus, H1N1, and Avian Flu. In fact, the United States and the world have been coping with the COVID-19 pandemic for nearly two years. All non-essential businesses and schools throughout New Hampshire and most of the United States were closed during the pandemic's early months in the spring of 2020.

Enfield has several risk factors for infectious diseases. The town's critical facilities include the Enfield Village School, the Enfield Shaker Museum, the Shrine of Our Lady of La Salette, the Whaleback Ski Area, Mascoma Lake, and many other gathering places. In addition, students in grades 5-8 attend the Indian River School, and students in grades 9-12 attend the Mascoma Valley Regional High School in Canaan. Both seasonal and year-round camps are also located in Enfield, particularly around Spectacle Pond and Crystal Lake. These factors enable infection and viruses to be easily transmitted from one community to the next.

To help mitigate the Covid-19 crisis, town officials closed the Town Hall to the public during the spring of 2020; town officials still conducted business remotely, online, or by appointment. The Town Hall reopened again during the summer of 2020 after installing mitigation measures, such as plexiglass and floor markings to promote social distancing. The Town Hall remains open with hybrid mitigation measures in place and mandatory mask requirements. The town continues to encourage social distancing, the use of face masks, and the protection of the town's most vulnerable citizens. Enfield applied for Public Assistance through FEMA and also worked with the State of New Hampshire Governor's Office for Emergency Relief and Recovery (GOFERR) for additional relief assistance.

¹⁷ Infectious diseases, Overview, <https://www.mayoclinic.org/diseases-conditions/infectious-diseases/symptoms-causes/syc-20351173>

As of February 18, 2022, the state reported 288,281 cases of Covid-19 and 2,333 deaths, as seen in the chart to the right.¹⁸ Also, on this date, the state reported 11 active and 622 cumulative cases of Covid-19 in Enfield.¹⁹ No known deaths from Covid-19 have been reported, making Enfield one of the least impacted communities in Grafton County; these numbers may be due to the absence of nursing homes and elderly care facilities in the community.

COVID-19 Summary Report

(data updated as of February 18, 9:00 AM)

Number of Persons with COVID-19 293,697

Recovered	288,281 (98%)
Deaths Attributed to COVID-19	2,333 (1%)
Total Current COVID-19 Cases	3,073
Current Hospitalizations	108

As of the writing of this plan, Covid-19 is still concerning in New Hampshire, the United States, and the world. The virus has consistently changed since early 2020, and now in early 2022, the deadly Delta and the fast-spreading Omicron variants are finally subsiding, relaxing some of the trauma in our hospital systems. However, daily death rates in the United States are still high. Testing and vaccines are helping to keep severe illness to a minimum; vaccines are available for all persons over the age of five who can take the shot. Although vaccination rates continue to climb, a portion of the public remains unwilling or unable to be vaccinated, thus increasing the threat to our hospital systems. Unvaccinated individuals continue to represent the majority of hospitalizations, severe illnesses, and deaths. The CDC reported²⁰ that as of February 22, 2022, 64.7% of the population had received two doses of the vaccine. Still, only 43.2% of the population had received two doses of the vaccine and a booster shot, the recommended actions to ward off severe illness and death. The CDC reported 932,894 Covid deaths in the United States since early 2020.²¹



As part of our discussion about infectious disease, it makes sense to discuss the opioid epidemic affecting the state and the nation in general. According to the National Institute on Drug Abuse, *“New Hampshire has the second highest rate of opioid-related overdose deaths in the country. In 2016, there were 437 opioid-related overdose deaths...from 2013 through 2016, opioid-related deaths in New Hampshire tripled”*²².

Like many New Hampshire communities, Enfield emergency personnel have also struggled with citizens' use of opioids, reporting an average of three overdose deaths and responding to multiple overdose incidents a year. Although the availability and use of NARCAN® have helped lower the death rate in New Hampshire, opioid-related overdoses and deaths are still a common occurrence.

Enfield's emergency service personnel maintain extensive pandemic planning to prepare for and respond to infectious diseases. The team felt that an epidemic or pandemic, such as the pandemic we are experiencing today, will continue to threaten the community's citizens. However, because there would be no direct impact on the town structures, the structure loss value was not estimated.

¹⁸ <https://www.covid19.nh.gov/>

¹⁹ <https://www.covid19.nh.gov/dashboard/map>

²⁰ CDC, Covid-19 Vaccinations in the United States; https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total

²¹ Ibid

²² NH Opioid Summary, National Institute on Drug Abuse; <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-summaries-by-state/new-hampshire-opioid-summary>

8) TROPICAL & POST-TROPICAL CYCLONES

Hazard Identification & Risk Assessment (HIRA)	Low
Probability	Low
Estimated Structure Loss Value	\$3,774,153 to \$18,870,765

Damaging winds due to tropical and post-tropical cyclones (hurricanes) are considered a medium risk, primarily because of Enfield's abundance of forested land. Like the 1938 hurricane, and hurricanes Carol and Edna in 1954, significant forest damage could occur. Although tropical and post-tropical cyclones could fit into several categories (wind and flooding), the team considered tropical and post-tropical cyclones separate events. Tropical and post-tropical cyclones are rare in New Hampshire, but they should be considered potential hazards. In most cases, tropical cyclones have been down-graded to post-tropical cyclones when they reach northern New Hampshire.

Tropical Storm Irene, the remnants of Hurricane Irene, brought heavy rain and wind to Enfield and created approximately \$50,000 in damage, with about half of the damage in the Methodist Hill Road area of town. The EOC was open, and there were some road closures from fallen trees. Lovejoy Brook overflowed, causing portions of roadways to wash out. Shaker Boulevard Bridge over the Knox River washed out and was replaced with a temporary bridge using FEMA money. Tropical Storm Sandy had little impact in Enfield, except for heavy rain and minor winds. Since the prior hazard mitigation plan, no tropical or post-tropical cyclones have reached Enfield.

The probability that a tropical and post-tropical cyclone would remain a Category 1 or higher in this part of the state is low. Therefore, the potential loss value due to tropical and post-tropical cyclones was determined to be between 1% and 5% of the total assessed structure value.

9) WILDFIRES

Hazard Identification & Risk Assessment (HIRA)	Low
Probability	Low
Estimated Structure Loss Value	\$3,774,153 to \$18,870,765

There are two potential losses with a wildfire, the loss of forest land and the threat to the built-up human environment and structures within the Wildland Urban Interface (WUI). In many cases, the only time it is feasible for a community to control a forest fire is when the built-up human environment is threatened.

Any wildfire discussion must include a discussion of the Wildland Urban Interface (WUI). The WUI can be determined in various ways; however, it represents the area in which the forest and human habitation intersect. At times the WUI is defined as the area out of reach of available fire hoses and water resources, while other times, it is determined to be areas with substantial tree cover and limited egress. For many New Hampshire communities, entire towns are thought to be in the WUI because of the abundance of hardwood and softwood trees. In more populated areas, the WUI is often determined to be in densely populated neighborhoods where a towering canopy of old-growth trees and limited access make people and structures more vulnerable. All structures within the WUI are assumed to be at some level of risk and, therefore, vulnerable to wildfire. See Section A in this chapter for more discussion on the WUI in Enfield.



The team described the forests of Enfield as consisting primarily of a combination of softwoods and northern hardwoods. With a low probability of drought and high humidity, it was felt that most fires are “duff” fires, the burning of *“the layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.”*²³ Burn permits are required in Enfield, as they are throughout the state, but often burning occurs without the proper permits. Sometimes it’s difficult for the fire department to monitor all conditions, and the occasional unauthorized burn will occur.

Due to the abundance of slash on the forest floor left by past ice storms, logging operations, blowdowns, and the mixture of hardwood and softwood trees throughout the forests, there is potential for fast-burning fuels, and a wildfire could potentially occur. Also, the recreational use of woods trails by snowmobilers, ATV operators, campers, and other outdoor enthusiasts creates an opportunity for sparks and out-of-control fires to ignite the town’s forested areas. To help mitigate the effects of wildfire, the Enfield Fire Department strives to improve and maintain firefighting equipment, maintain water resources, and manage a Capital Reserve Fund to help pay costs for new equipment.

Significant wildfires in New Hampshire are uncommon; still, four large fires have occurred in the state in recent years, the Dilly Cliff Fire in Woodstock, the Covered Bridge Fire in Albany, the Bayle Mountain Fire in Ossipee, and the Stoddard Fire in Stoddard. The 2021 Annual Report indicated that only 9.64% of the Enfield Fire Department’s calls were fire calls.²⁴ No wildfires over five acres were reported since the previous hazard mitigation plan

Given the right set of conditions - drought, lightning, human interface - the potential for a significant wildfire is good. The impact of climate change on drought could also play a role in predicting wildfires. Therefore, the potential loss value was estimated to be between 1% and 5% of the total assessed structure value.

10) EARTHQUAKES

Hazard Identification & Risk Assessment (HIRA)	Low
Probability	Low
Estimated Structure Loss Value	\$3,774,153 to \$18,870,765

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric, and phone lines, and are often associated with landslides and flash floods. Since 1940, only two earthquakes with a magnitude greater than 5.0 have occurred in New Hampshire; both earthquakes occurred in Ossipee in December of 1940 (5.5-5.8). Since 1982, three earthquakes with a magnitude greater than 4.0 have occurred in the state. One of these earthquakes occurred in Laconia (4.0); two occurred in Berlin, one in 1988 (4.0) and another in 1989 (4.1).

In September 2010, a 3.1 magnitude earthquake in Boscawen was felt in Enfield, but no damage was reported. The most recent earthquake to be felt by many New Hampshire residents occurred in October 2012, with its epicenter in Hollis Center, ME. The team noted that the Hollis earthquake was not felt in Enfield. A less significant earthquake, with a magnitude of 2.7, occurred in East Kingston in February 2018. The East Kingston quake was not felt in Enfield. Many small earthquakes such as this one frequently occur in New Hampshire.

It is well documented that fault lines run throughout the state, but high magnitude earthquakes have not been frequent in New Hampshire history. Although historically, earthquakes have been rare, the potential exists, and depending on

²³ <http://www.fs.fed.us/nwacfire/home/terminology.html>

²⁴ 2021 Annual Report, Enfield, NH; Fire Department Report, page 198

the location, the impact could be significant. Therefore, the potential structure loss value due to earthquakes was determined to be between 1% and 5% of the total assessed structure value.

11) DROUGHT

Hazard Identification & Risk Assessment (HIRA)	Low
Probability	Low
Estimated Structure Loss Value	\$0 to \$3,774,153

An extended period without precipitation or drought could elevate the risk for wildfire and blow-downs in the community's forested areas. With an extreme drought, the water supply and aquifer levels could be threatened. According to the NH Department of Environmental Services (DES), seven significant droughts had occurred since 1929,²⁵ including the droughts of 2016 and 2020. However, there is a concern that more frequent and longer-lasting droughts will occur with climate change. Enfield's residents rely on private wells and municipal water services.

The 2016 drought was significantly worse in the southern part of the state. The image to the right from WMUR-TV shows drought conditions in September 2016²⁶. The Enfield planning team was unaware of any dug or artesian wells that failed during the 2016 drought. Additionally, there was only a slight impact on available water resources for firefighting.

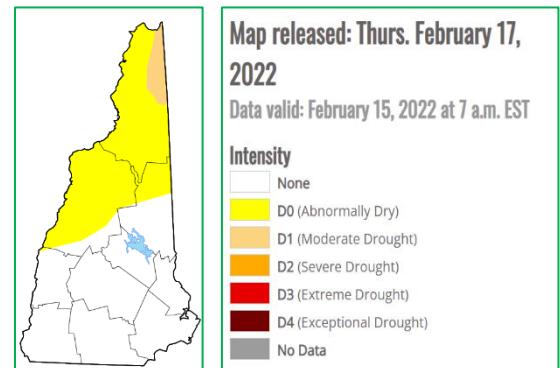


WMUR Archives; September 15, 2016

The 2020-2021 drought, although not as significant as the 2016 drought in southern NH, was more noteworthy in the central and northern parts of the state. Enfield reported that a few dug-wells were affected during this drought, and there was diminished water resource availability.

As of February 17, 2022, Grafton County and Enfield showed abnormally conditions, although the very northeastern part of the state remained either in "moderate drought" conditions, as seen in the image to the right²⁷.

The cost of future droughts is challenging to calculate as any cost would likely result from associated fire risk, crop loss, and diminished water supply. Based on these assumptions, the structure loss value was not estimated.



²⁵ NH DES; <http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf>

²⁶ <https://www.wmur.com/article/extreme-drought-conditions-worsen-in-new-hampshire/5269231>

²⁷ <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?NH>

D. TECHNOLOGICAL HAZARDS

The following technological 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 nonetheless worth mentioning as real and possible hazards that could occur in Enfield. The estimated structure loss was not determined for technological hazards.

1) AGING INFRASTRUCTURE

Hazard Identification & Risk Assessment (HIRA) Medium
Probability High

“Infrastructure is the backbone of our community. While we don’t always acknowledge it, the condition of our infrastructure has a very real impact on our lives. We all depend on roads and bridges to get us where we are going, water infrastructure that delivers clean on-demand water, electricity to light our home and office, and schools that will facilitate a learning environment.”²⁸

Aging infrastructure is the continued deterioration of roads, bridges, culverts, ports, railroads, wastewater facilities, airports, dams, utilities, and public water and sewage systems. The State Multi-Hazard Mitigation Plan states that the average lifespan of a bridge is 50 years; the current average age of state-owned bridges in New Hampshire is 52-56 years.²⁹ The American Society of Civil Engineers gave NH a C- rating overall in its 2017 report card.³⁰

Enfield’s aging infrastructure is a concern as it is throughout New Hampshire and the United States. The Enfield planning team indicated that water and septic lines, some dating to 1907, need to be replaced. The team also indicated that some of the town’s critical facilities are either aging and need work or cannot meet the modern challenges of their departments. A Municipal Facilities Committee has been formed to address these issues; plans include updates to existing buildings or the construction of new facilities, such as a Public Safety Complex for fire, ambulance, and law enforcement.

2) DAM FAILURE

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Low

According to the Department of Environmental Services (DES) and GIS data files, there are 17 dams in Enfield; ten of these dams are active dams, and the remaining seven are breached, removed, exempt, or in ruins. Enfield’s active dams include two high-hazard dams, one significant-hazard dam, three low-hazard dams, and four non-menace dams.

High-Hazard Dams

The George Pond Dam at the Knox River, owned by the Town of Enfield, is reportedly in good shape. The water behind the dam averages 3-4 feet deep; with this small amount of impound, a failure would likely only affect a few gardens. The planning team noted that this dam might be misclassified as a high-hazard dam.

²⁸ <https://www.infrastructurereportcard.org/wp-content/uploads/2016/10/2017-NH-Report-Card-hq-with-cover.pdf>

²⁹ NH Multi-hazard Mitigation Plan, 2018, page 156

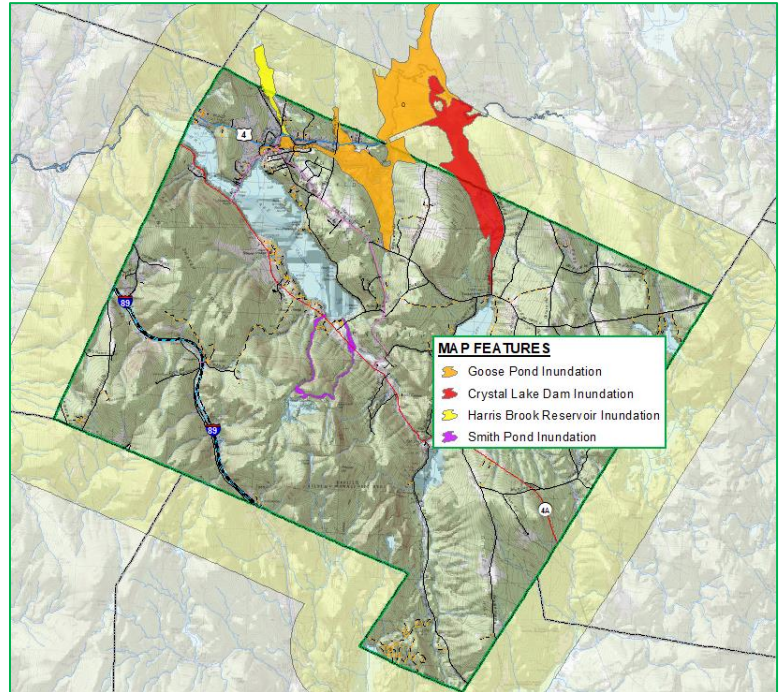
³⁰ Ibid

Smith Pond Dam at Smith Pond Brook, owned by the Upper Valley Land Trust, was recently rehabilitated and is in excellent condition. A significant dam breach could cause flooding from Smith Pond in two directions, potentially flooding busy NH Route 4A. According to the inundation studies, the floodwaters from a dam breach could flow into Mascoma Lake; however, it appears that few if any structures would be in harm's way.

Other Dams

In addition to Smith Pond Dam, three other dams are concerning. Crystal Lake Dam in Enfield and Harris Brook Reservoir Dam in Canaan are designated as significant-hazard dams; Goose Pond Dam in Canaan is classified as a high-hazard dam. As shown in the map snip to the right, the inundation pathway for both the Harris Brook and Goose Pond Dams could impact the Village of Enfield with the swelling of the Mascoma River. Like the Smith Pond Dam, a breach at the Crystal Lake Dam would likely impact few if any structures.

Department of Environment Service (DES) reports and copies of Emergency Action Plans (EAPs) for the high-hazard dams (Goose Pond, George Pond, and Smith Pond) and one significant-hazard dam (Harris Brook Dam) are held by the Emergency Management, the Director of Public Works, and other town officials.



3) LONG TERM UTILITY OUTAGE

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Moderate

Long term utility outages of five or more days have occurred in Enfield, both due to local line damage from high winds and storms and problems with the power grid. A significant or extended power outage lasting for more than a week could result in hardship on individual residents, particularly the elderly, disabled, or poor. The team reported that long term power outages have diminished due to utility companies' efforts to trim trees and branches near power lines.

Still, long term utility outage is a concern, particularly when combined with any of the natural hazards detailed above. However, the team felt that many residents are self-sufficient, as many are now equipped with generators and woodstoves. An extended power failure's most significant impact would be the inconvenience caused by the inability to pump water for residents who rely on wells. It is also noted that virtually all services, including major pharmacies and grocers, are located out of town; driving during severe weather events to obtain necessities can be difficult due to poor road conditions. The team noted that the last power outage occurred in late October 2017; some residents lost

4) HAZARDOUS MATERIALS

Hazard Identification & Risk Assessment (HIRA) Low
Probability Very Low

Hazardous material in fixed locations is a concern in many New Hampshire communities. However, Enfield's concern for hazardous materials in fixed locations is relatively low. Manufacturers, gas stations, fuel depots, small businesses, and even homes can have hazardous chemicals, explosive materials, or poisons on site. Breaches in the storage, use, production, or disposal can affect the groundwater, aquifers and water supply, and the air we breathe. Residents on private property may also store hazardous materials. The town participates in collecting hazardous materials to help homeowners dispose of household materials, such as paint.

Tier II facilities are those that normally use chemicals in their day-to-day operations. Several of Enfield's Tier II reporting facilities were noted as susceptible to damage from a fixed hazardous material event. These include but are not limited to bulk fuel storage facilities such as Eastern Propane and Evans Bulk Fuel Storage, Whaleback Mountain Ski Resort, Keene Medical, the Irving Gas Station, a private golf course, three auto service garages, and one body shop. Since the previous hazard mitigation plan, the team did not report any hazardous materials leaks, spills, or explosions that were not transportation-related.

If hazardous materials were to ignite, entire buildings could be susceptible to explosion and fire. The resulting losses could be substantial in terms of structure loss and loss of business revenue for local merchants.

5) CONFLAGRATION

Hazard Identification & Risk Assessment (HIRA) Low
Probability Very Low

“Conflagration is an uncontrolled burning that threatens human life, health, property or ecology. A conflagration can be accidentally or intentionally created”.³¹

Enfield's risk for a large uncontrolled fire is particularly threatening in Enfield Village; this area contains a high density of older wooden properties, including the Town Hall, the Police Station, and business facilities. When combined with high winds and a lack of water resources, these factors could potentially result in a sizeable uncontrolled fire that could spread from building to building across Enfield Village. A fire of this sort could result in an explosion, affect the transportation infrastructure, hamper communication and power systems, and shut down the businesses along Main Street.

The impact on communication, power, and transportation would likely be temporary, but damage to homes and businesses could be significant.

OTHER TECHNOLOGICAL HAZARDS

Other Technological Hazards discussed in Enfield but not considered significant enough to discuss here were: Known & Emerging Contaminants and Radiological. See Chapter 3, Section A, for more information on hazards excluded from this plan.

³¹ Fire Definitions; HotAsBlazes.com

E. 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 nonetheless worth mentioning as real and possible hazards that could occur in Enfield. The estimated structure loss was not determined for human-caused hazards.

1) MASS CASUALTY INCIDENTS

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Moderate

A Mass Casualty Incident (MCI) is defined as “*any number of casualties that exceed the resources normally available from local resources*”³². MCIs have been known to occur due to bus, auto, train, and aircraft accidents and incidents involving large crowds. MCIs can also result from natural hazards such as hurricanes, floods, earthquakes, and tornadoes. No MCIs have occurred since the previous hazard mitigation plan; however, as noted below and in Table 3.2, a transportation accident involving hazardous materials occurred in 2018.

An MCI could happen anywhere in Enfield, but more likely on Interstate 89 or US Route 4. Interstate 89 is heavily traveled year-round but is particularly dangerous during winter storm events and on Friday and Sunday nights when snow enthusiasts travel to and from southern areas to ski in the White Mountains of NH and the Green Mountains of VT. Routes 4 and 4A are winding and busy road that often sees animal crossings and poor weather. With the influx of tourists to the region throughout the year and tour and school bus activity, an MCI is a genuine risk for the town.

2) TRANSPORT ACCIDENTS

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Moderate

The possibility of vehicular accidents involving hazardous materials is identified as potentially significant in Enfield. The town’s major roads, Interstate 89, US Route 4, and NH Route 4A, are all known to be used by vehicles that carry hazardous materials. These roadways traverse the Enfield area, at times traveling through areas with little or no population and, at other times, traveling through densely populated areas such as Enfield Village.

Many of Enfield’s roads are narrow and winding and subject to severe winter weather; they become treacherous when affected by flooding, winter snow conditions, and ice. Vehicular accidents, wildlife collisions, and truck accidents involving hazardous materials are always possible in these conditions. A major ice storm or another significant event can make egress and access difficult for individuals and first responders. All roadways in Enfield are susceptible to hazards such as road flooding and high winds leading to downed trees in the roadways and potentially hazardous materials spills.

Interstate 89 conveys considerable commercial traffic, carrying dangerous substances such as liquid hydrogen. US Route 4 and NH Route 4A are also known commercial routes for vehicles carrying large amounts of chemicals, propane, oil, gas, and other petroleum products. Route 4 averages 11,000-13,000 cars and trucks daily and serves as a significant route to Hypertherm and the Dartmouth Hitchcock Medical Center (DHMC). Treacherous winter driving conditions make these busy routes vulnerable to hazardous materials accidents. Since the previous hazard

³² DeValle Institute Learning Center; <https://delvalle.bphc.org/mod/wiki/view.php?pageid=89>

mitigation plan, a significant chemical spill on I-89 north occurred. The chemical that spilled was thought to be an industrial glue; the Department of Environmental Services (DES) and Clean Harbors performed the cleanup after the event.

The losses could be relatively high depending on a hazardous material accident location, both in property and structural damage. However, the losses are expected to be localized and unlikely in the densely populated Enfield Village, where the speed limit is reduced.

3) TERRORISM & VIOLENCE

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Low

Terrorism is feared throughout our country and the world. Although Enfield has several low-risk targets, such as the Enfield Village School, the Town Hall, and local churches, no significant high-risk targets are located in the community, except for Interstate 89. Interstate 89, a major thoroughfare connecting New Hampshire and Vermont and alternative routes between the US and Canada, is heavily traveled. Major disruptions on I-89 could cause significant transportation issues during an emergency, causing business, travel, commerce, and response difficulties.

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.

4) CYBER EVENTS

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Moderate

Presidential Policy Directive (PDD-41) describes a cyber incident as *“An event occurring on or conducted through a computer network that actually or imminently jeopardizes the integrity, confidentiality, or availability of computers, information or communications systems or networks, physical or virtual infrastructure controlled by computers or information systems, or information resident thereon. For purposes of this directive, a cyber incident may include vulnerability in an information system, system security procedures, internal controls, or implementation that could be exploited by a threat source.”*³³

With the increased use of computers and the internet, cyber events could include targets such as banks, hospitals, schools, churches, town, city and state government operations, emergency operations and critical infrastructure. Cyber events have been known to occur almost anywhere, from very small towns to large facilities in New Hampshire, causing large expenditures, disruption in everyday business practices, and data loss. Several communities in New Hampshire have had their data held for ransom.

The Enfield planning team did not report any cyber-attacks, but the threat is certainly real. The town stores essential documents on a server at the Town Hall; the information is also stored in the “cloud”. Added security on computer networks, off-site backup, and user education are vital to protect sensitive town information and data.

³³ PDD-41; <https://obamawhitehouse.archives.gov/the-press-office/2016/07/26/presidential-policy-directive-united-states-cyber-incident>

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Chapter 6: Current Policies, Plans & Mutual Aid

A. ANALYSIS OF THE EFFECTIVENESS OF CURRENT PROGRAMS

After researching historic hazards, identifying CIKR, and determining potential hazards, the team determined what is already being done to protect its citizens and structures. Once identified, the team addressed each current policy or plan to determine its effectiveness and whether improvements were needed. This analysis became one of the tools the team used to identify mitigation action items for this plan.

Creating new action items was less challenging, knowing what regulations Enfield currently had in place. In addition, this process helped identify current plans and policies that are working well and those that should be addressed as a new “Action Item” and the responsible departments. The table that follows, *Table 6.1, Policies, Plans & Mutual Aid*, shows the analysis resulting from the team's discussion.

Existing policies, plans and mutual aid that were designated as “Improvements Needed” were added to **Table 9.1, Mitigation Action Items** as new strategies and were reprioritized to meet the current needs of the town.

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 or meet its goals.

Poor The existing program does not work as intended, often falls short of its goals or may present unintended consequences.

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Public Education & Awareness	An emergency web page is a great way to provide outreach to residents on emergency preparedness and mitigation techniques property owners can use to reduce or eliminate the impact of natural hazards. The Town of Enfield is well situated to provide public information and outreach to its citizens through various means but does not have an emergency webpage.	Emergency Management Director & Other Departments	Good	Improvements Needed: Although the town can provide public outreach via social media platforms or through the Enfield Listserv and its subscription email service, there is no emergency management webpage. This strategy is deferred to provide robust information and links on an emergency management web page to educate the public on general and seasonal mitigation techniques using all available social media platforms. (see Table 2.1) Action Item #9 (also in Table 7.1)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Tree Removal Program	A tree removal program reduces damage from fallen trees and limbs to power lines, stormwater ditches, and structures. Tree removal also reduces the potential impact of wildfires, severe weather, ice storms, and other natural hazards. Enfield has been recognized as a 2020 Tree City by the Arbor Day Foundation.	Department of Public Works	Good	Improvements Needed: As trees become damaged and threaten town roads, the DPW removes them. NH DOT (state roads), Eversource, Liberty Utilities, and the NH Electric Coop (utilities) do this as needed. This strategy is deferred to continue local tree and brush removal efforts to mitigate the effects of high wind events, ice storms, wildfires, and other natural hazards and continue participation in the Tree City program. Action Item #6 (also in Table 6.1) (combines two items from Table 7.1)
Culvert & Stormwater Maintenance Plan	A Culvert & Storm Water Maintenance Plan includes an inventory of all culverts and ditches in the community along with a record of the location, size, etc. The Enfield DPW and NH DOT clean the drainage basins once a year and after significant flooding events. Culverts are repaired as needed.	Department of Public Works	Good	Improvements Needed: The Enfield DPW does an excellent job cleaning and repairing drainage basins and culverts and is developing a written Culvert Replacement Plan. This strategy is deferred to complete the Culvert Replacement Plan, continue maintenance of all drainage systems, update the plan as needed and note details about any hazards (i.e., flooding) associated with the town's drainage systems. Action Item #17 (also in Table 7.1)
National Flood Insurance Program (NFIP) & Floodplain Ordinance (part of Zoning Ordinance)	The National Flood Insurance Program (NFIP) addresses the need for flood insurance and the need to reduce flooding's devastating consequences. The NFIP aims to protect communities from potential flood damage through floodplain management; the NFIP provides flood insurance. A community's floodplain ordinance regulates all new and substantially improved structures in the 100-year floodplain, as identified on the FEMA Flood Insurance Rate Maps (FIRMS); Enfield's FIRMS are dated February 20, 2008.	Planning Board	Good	Improvements Needed: The town became a member of the National Flood Insurance Program (NFIP) on May 17, 1988. The Enfield Flood Ordinance works well to successfully prohibit or force compliance for building and substantial improvements in the FEMA flood zone. The Zoning Ordinance, which contains the Flood Ordinance, was last amended in 2020. This strategy is deferred to this plan to continue compliance with the NFIP, obtain NFIP brochures to have available at the Town Hall, and provide public outreach regarding the benefits of membership in the NFIP, whether or not properties are in the FEMA floodplain. It is also deferred to provide links to the NFIP and Ready.gov and vital information on flood mitigation techniques for property owners. Action Item #11 (also in Table 7.1)
Wellhead Protection Program	A wellhead protection plan aims to prevent the contamination of groundwater used for drinking water. The surface and subsurface areas surrounding the public water supply can attract contaminants.	Water Department	Good	Improvements Needed: The Enfield Water Department has identified a wellhead protection area. As suggested by the state, the town should review the wellhead protection plan to make it more compliant with state regulations and better ensure public water supply protection. Action Item #3 (also in Table 7.1)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
<p>Subdivision Regulations (2017)</p> <p>--</p> <p>Zoning Ordinance (2020)</p> <p>--</p> <p>Building Codes</p>	<p>The purpose of subdivision regulations is to provide for the orderly present and future development of the town by promoting public health, safety, convenience, and welfare. Zoning regulations deal with land use, including rural, residential, flood zone, agriculture, and timber management. Zoning regulations often include drainage and infrastructure provisions.</p>	<p>Planning Board</p>	<p>Good</p>	<p>Improvements Needed: The Enfield Subdivision Regulations (2017), the Zoning Ordinance (2020), and the Building Codes are in good shape. Enfield's regulations address setbacks, road frontage, and the size of the lot. Regulations also address water resource availability, steep slope regulations for driveways, structures, and roads, clearcutting, erosion and sediment control, and maintaining adequate stormwater flow. This strategy is deferred to continue enforcement and review the Subdivision Regulations, the Zoning Ordinance, and the Building Codes after approval of this plan to identify possible changes to mitigate the natural hazards identified in this plan. Action Item #18 (also in Table 7.1) (combines four items from Table 7.1)</p>
<p>Bridge Maintenance Program</p>	<p>Inspection and clean-up of bridges occur annually. The state inspects all bridges every other year and maintains them regularly. There is currently one red-listed bridge, the Oak Hill Road Bridge across Bicknell Brook</p>	<p>Department of Public Works</p>	<p>Good</p>	<p>Improvements Needed: The Enfield Department of Public Works has established a short and long-term schedule for bridge maintenance and replacement for the 12 town-owned bridges in town. The Oak Hill Road Bridge is the only town-owned bridge that is red-listed. This strategy is deferred to replace this rusted steel culvert with a 30' bridge. Engineering studies and funding have been approved; replacement is planned for the summer of 2022. Action Item #31</p>
<p>Grafton County CodeRED</p>	<p>Grafton County CodeRED is a reverse calling warning system that uses listed phone numbers. CodeRED does not include cell and unlisted numbers or email addresses. The Enfield School District uses the "Alert Now" reverse calling system, which is used for school activities and emergency notification.</p>	<p>Emergency Management Director</p>	<p>Average</p>	<p>Improvements Needed: Grafton County CodeRED is an excellent warning system, but it only stores resident landline phone numbers. The town has continuously provided information to residents about CodeRED. This strategy is deferred to continue providing public outreach to encourage all residents to contact CodeRED to add cell numbers, emails, unlisted numbers, and verify their personal information. Use the website, a possible brochure at the town hall, or available social media platforms. Action Item #10</p>

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
E- 911 Signage Compliance	Enfield has established an ordinance about E-911 signage. E-911 signage compliance includes markers at driveway entrances that identify residence locations in conjunction with the E-911 alerting system. In the past, Enfield ran a campaign to increase compliance.	Fire & Police Departments	Good	Improvements Needed: Enfield is about 85% compliant with E-911 signage. This strategy is deferred to this plan to consider improving signage compliance so that emergency responders can better assist the public. Use public outreach opportunities such as an emergency management webpage, the Enfield Listserv, or available social media platforms to promote compliance. Develop other means of increasing compliance, such as purchasing and installing signage or providing signs for residents to install themselves. Action Item #1
Burning Index	New Hampshire Forests & Lands (DNCR) has a burning index that measures wildfires' risk, including how likely fires are to start on a given day. It also evaluates the potential damages wildfires can create, the number of people needed to fight them, and the type of equipment that might be needed.	NH Hampshire Forests & Lands (DNCR) & Fire Department	Good	Improvements Needed: The Fire Department receives the regular notification of the burning index from NH Forests & Lands; this notification is made daily during fire season. This strategy is deferred to consider installing a Fire Danger Sign at a predetermined location. Action Item #19
Capital Improvement Program (CIP) (Reviewed Annually)	A Capital Improvement Plan (CIP) is a decision-making tool used to plan and schedule town improvements over at least six years. A CIP provides a suggested timeline for budgeting and implementing needed capital improvements.	CIP Committee	Good	Improvements Needed: A CIP is generally reviewed and updated to ensure that the program's goals will be achieved. This strategy is deferred to review the CIP and this hazard mitigation plan to consider integrating action items from this plan into the CIP. Action Item #22
Emergency Operation Plan (2015)	An Emergency Operations Plan identifies response procedures and capabilities to natural, technological or human-caused hazards.	Emergency Management Director	Good	Improvements Needed: The Enfield Emergency Operations Plan (EOP) was last updated in 2015 and is ready for an update, based on the state's 5-year recommendation. The new EOP will include an EOC Call Alert List, a detailed Resource Inventory List, and Player Packets. This strategy is deferred to this plan to update the EOP. Action Item #20
Fire & HazMat Training	Fire Department and EMS personnel train for emergencies, including wildfire suppression and hazardous materials response. Firefighters are trained in the basic response to HazMat incidents and maintain perimeters until specialized teams arrive.	Fire Chief, Fire Warden & Emergency Management Director	Average	Improvements Needed: The Fire Chief coordinates the training of all fire responders. Training includes many aspects of emergency response, including wildfire and HazMat response. Training is done locally or through the Upper Valley Mutual Aid Association and the State of New Hampshire Fire Academy. Although this is preparedness, this strategy is deferred to improve training opportunities for firefighters. Action Item #7

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Emergency Generators	The town has emergency backup power at many of the town's Critical Infrastructure & Key Resources (CIKR), including the Police Station, the Department of Public Works Garage, the Community Building (generator capable), and several communications towers (see Table 4.1). The town should install a permanent generator at the Enfield Community Center (primary shelter), the Enfield Village School (secondary shelter), and one municipal water well. The Enfield Fast Squad does not have a generator; however, plans are being considered for a new public safety building, including the Fast Squad, Fire Department, and Police Department. A new public safety building would be constructed with a permanent generator.	Emergency Management Director	Good	Improvements Needed: Although Enfield has emergency backup power at many of the town's Critical Infrastructure & Key Resources (CIKR), the town could benefit from a permanent generator at the Enfield Community Center (primary shelter), the Enfield Village School (secondary shelter), and one of the municipal wells. This strategy is deferred to obtain and install emergency generators at the Community Center, the Enfield Village School, and one municipal water well. Permanent generators will improve these facilities' use during a disaster. A proposed new public safety building for the Fire Department, Police Department, and the Fast Squad would be constructed with a permanent generator. Action Item #24, 25 & 33
Enfield Hazard Mitigation Plan (2015)	A hazard mitigation plan is designed to address natural, technological, and human-caused hazards and to understand the risk these pose for the community. A hazard mitigation plan aims to create action items that will make the community safer by lessening or eliminating the impact of hazards.	Emergency Management Director	Good	Improvements Needed: The Enfield Hazard Mitigation Plan (2015) is being updated with this plan. This strategy is deferred to review this plan, the Enfield Hazard Mitigation Plan 2022, annually and update the plan again in 2027. Action Item #23
Master Plan (2022-in process of update)	A Master Plan includes goals, objectives, and expectations for the town's future development.	Planning Board	Average	Improvements Needed: The Enfield Master Plan is being updated currently; the last update was in 1995. The town has established a Master Plan task force, has received bids, and will present the project to Enfield's citizens for approval at the 2021 Town Meeting. This strategy is deferred to consider including a natural hazards section, a discussion on climate change, and action items from this plan into the pending update. Action Item #28

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
NIMS & ICS Training	The National Incident Management System (NIMS) and the Incident Command System (ICS) provide training that can help ensure effective command, control, and communications during emergencies.	Emergency Management Director	Good	Improvements Needed: Most first responders have done NIMS & ICS training. Although this is preparedness, this strategy is deferred to this plan to continue providing NIMS (IS-700) & ICS (ICS 100 & ICS 200) training to new first responders and town officials as they become elected or appointed. Action Item #8
Pressurized, Dry Hydrants & other Water Resources	The Fire and the Water Departments maintain dry hydrants and pressurized hydrants. Enfield has approximately 68 pressurized hydrants and 12 dry hydrants; multiple locations are also available for water drafting.	Enfield Fire Department & Enfield Water Department	Excellent	Improvements Needed: Pressurized hydrants, dry hydrants, and drafting sites throughout Enfield are utilized to provide water resources for firefighting. This strategy is deferred to maintain the pressurized hydrants (Water Department) and the dry hydrants and other water resources (Fire Department) in the community to help mitigate the effects of structure fires and wildfires. Action Item #2
State Health Department Public Health Plan	The state health department wrote the state plan, "Influenza, Pandemic, Public Health Preparedness and Response Plan", to be prepared for any public health emergency. The town is part of the Upper Valley Regional Public Health Emergency Annex. (UVRPHN)	Upper Valley Regional Public Health Network (UVRPHN)	Good	No Improvements Needed: Following guidelines in the state public health plan, the Upper Valley Regional PHN and the MACE assist the community on all public health issues. The Enfield Health Officer attends public health meetings whenever possible. The Upper Valley Regional PHN activity has increased and improved during the Covid-19 pandemic. (also in Table 7.1)
Building Code & Permits	The town has adopted International Building Codes (IBC) or International Residential Codes (IRC). The town requires builders to follow all the state-adopted codes for new construction to meet national standards for flood, wind, earthquake, fire, and snow load.	Planning Board	Good	No Improvements Needed: The Town of Enfield has a Building Inspector. The permitting process requires builders to abide by all state-adopted building codes, including the International Building Codes (IBC) and the International Residential Codes (IRC). The permitting, approval and enforcement process for new buildings or substantial improvements continues and works well in Enfield. (also in Table 7.1)
Emergency Action Plan (Dams)	Dam Emergency Action Plans are designed to provide notification and evacuation procedures should a dam failure occur.	Fish & Game, Department of Environmental Services (DES), the town and Private Owner	Average	No Improvements Needed: Enfield has two high-hazard dams, the George Pond Dam (town) and the Smith Pond Dam (private); the EOC/Police Department and the DPW have current copies of the Emergency Action Plans for both dams. George Pond Dam does not present a significant hazard to people or structures. The Smith Pond Dam has been recently rehabbed. There is no mitigation needed on either of these two dams; these dams are continuously monitored by DES, the DPW, and the private owner. (also in Table 7.1)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Shoreland Water Quality Protection Act (formerly the Comprehensive Shoreland Protection Act)	The Shoreland Water Quality Protection Act (SWQPA) establishes minimum standards for using and developing shorelands adjacent to the state's public water bodies. The SWQPA includes changes to vegetation requirements within the natural woodland and waterfront buffers, impervious surface limitations and includes the shoreland permit by notification process.	State of NH	Average	No Improvements Needed: A 50' wetlands buffer that mirrors the state's requirement is included in the Zoning Ordinance. The Town of Enfield follows and exceeds the regulations detailed in the Shoreland Water Quality Protection Act. Wetlands Protection continues to be recognized and enforced. (also in Table 7.1)
NH Forest and Lands & Fire Permits	NH Forest & Lands, a division of the NH Department of Natural & Cultural Resources (DNCR), regulates open burning and permits.	NH Forests & Lands (DNCR) & Local Fire Warden	Good	No Improvements Needed: The system in place with NH Forests & Lands (DNCR) and the local fire warden works well. The public is aware of fire permitting requirements and the ability to get permits online (\$3.00 fee required).
Capital Reserve Fund (CRF) (Reviewed Annually)	A Capital Reserve Fund is an account on a town's balance sheet reserved for long-term capital investment projects or other anticipated future expense(s). Reserve funds are set aside to ensure adequate funding to finance future projects, equipment, and other expenditures.	Select Board	Good	No Improvements Needed: The town's Capital Reserve Funds are set aside each year at budget time to assist the town's departments with planned purchases of equipment and supplies or in emergencies. The Enfield Capital Reserve Funds work well and are part of the town warrant at the annual Town Meeting.
Emergency Trailers	Emergency Command and American Red Cross Trailers may provide mobile emergency communications, supplies, and other resources to a community or region.	Emergency Management Director	Good	No Improvements Needed: Enfield has access to the Grafton County Emergency Command Trailer (Haverhill) and an American Red Cross Trailer (Littleton).
Mutual Aid Agreements (Fire, Police, DPW & EMS)	Mutual Aid agreements provide communications capabilities and cooperative assistance between area cities and towns; mutual aid provides access to resources appropriate to the scope of the emergency.	Police, Fire, DPW & EMS	Excellent	No Improvements Needed: The Enfield Fire Department has a mutual aid agreement with the Upper Valley Mutual Aid Association. The Enfield Police Department has mutual aid agreements with surrounding towns, the NH State Police (Troop F), and the Grafton County Sheriff's Office. The DPW is a member of the NH Public Works Mutual Aid Association. The Enfield Fast Squad performs EMS services and medical transportation and can rely upon area EMS agencies for assistance if needed. All mutual aid systems in Enfield work well.

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Life Safety & Fire Codes	Life safety and fire codes guide the safe construction and operation of buildings.	Fire Department	Good	No Improvements Needed: The National Fire Protection Association (NFPA) and the NH safety and fire codes guide the Enfield Fire Department to inspect all commercial, public assembly, and rental properties (3 units or more). The Building Inspector/Health Officer does an excellent job providing timely inspections.
Radio Communications	Radio communications are vital for responding to all types of emergencies and hazards. Radios should be interoperable and up-to-date with current technology.	Emergency Management Director	Excellent	No Improvements Needed: All three emergency departments in Enfield (Police/Fire/DPW) have radio interoperability. Communications systems and radios are updated with state and federal requirements and work as intended.
Local Road Design Standards	Local road design standards are specifications for constructing new roads in a community.	Select Board & Department of Public Works	Good	No Improvements Needed: Local road standards have been established to provide specifications for building new roads to ensure that the town does not assume ownership of substandard roads. The town will not assume ownership of roads not built to Class V standards. The Select Board accepts new roads once subdivision regulations are met.
School Emergency Operations Plan (SEOP)	A School Emergency Operations Plan guides the response to emergencies at the school.	Police, Fire & Emergency Management Director	Excellent	No Improvements Needed: According to state requirements, SAU 62 completes school Emergency Operations Plans (EOPS) annually. The Enfield Village School, the Indian River Middle School, and the Mascoma Valley Regional High School have current plans updated according to state requirements. Drills and exercises are done quarterly and include the participation of the town's emergency responders.
Site Plan Review Regulations	Regulations ensure that uses permitted by zoning are constructed on a site to fit into the area in which they are being constructed without causing drainage, traffic, or lighting problems.	Planning Board	Good	No Improvements Needed: The town's stringent site plan review regulations apply to all business and multi-family units; these regulations do what they are meant to do.
Social Media Accounts	Social media accounts, such as Facebook, Twitter, Instagram, and local online newsletters, can provide excellent information on emergency preparedness and hazard mitigation strategies that can be taken to protect homes and property.	Department Heads	Excellent	No Improvements Needed: Facebook pages are maintained by the Town Hall, the Fire Department, the Police Department, the Recreation Department, and the library. The town also has established a Listserv and a subscription email service for its residents and visitors. These social media accounts work very well to keep Enfield's citizens informed about things happening in their town (see Table 2.1).

Chapter 7: Last Mitigation Plan

A. DATE OF LAST PLAN

Based on the Disaster Mitigation Act (DMA) of 2000, Enfield has developed hazard mitigation plans in the past. The most recent update was formally approved in 2015. The Enfield Hazard Mitigation Plan Update 2022 updates the 2015 plan.

Below are the action items that were identified in the 2015 plan. The team identified the current status of each strategy based on three sets of questions:

COMPLETED

- Has the strategy been completed?
- If so, what was done?

Strategies “deferred” from the prior plan, were added to **Table 9.1, Mitigation Action Plan** as new strategies and were reprioritized to meet the current needs of the town.

DELETED

- Should the strategy be deleted?
- Is the strategy mitigation or preparedness?
- Is the strategy useful to the town under the current circumstances?

DEFERRED

- Should the strategy be deferred for consideration in this plan?
- Should this strategy be reconsidered and included as a new action item for this plan if the strategy was not completed?

In *Table 7.1: Accomplishments since the Last Plan*, the team assessed what had been accomplished and determined what additional work may be needed. Columns in **red font** were extracted word-for-word from the 2015 Hazard Mitigation Plan. Three additional columns not shown here – *Who (Leadership)*, *How (Funding Sources)*, and *Cost (Estimated)* – can be found in the 2015 Hazard Mitigation Plan.

TABLE 7.1: ACCOMPLISHMENTS SINCE THE LAST PLAN

Mitigation Project from 2015 HMP	Time Frame	Completed, Deleted, or Deferred
Back-up Water Supply: Pursue a water supply on that eastern side of Mascoma Lake that would serve as a backup water source in the event of drought.	Long Term	Deferred: As suggested in the previous hazard mitigation plan, a backup water supply on the eastern side of Mascoma Lake was not completed. This strategy is deferred to explore possible backup water solutions, including connecting with the Lower Shaker Village community water system. Action Item #27
Crystal Lake Road: Stabilization of the bank between Crystal Lake and Crystal Lake Road to stop the bank from falling into the lake.	Medium Term	Deferred: Stabilization of the bank between Crystal Lake and Crystal Lake Road has not been done as suggested in the previous plan. This strategy is deferred to review the situation in this area and provide rip rap or other bank stabilization techniques to mitigate further erosion and keep the bank from falling into the lake. Action Item #32

Mitigation Project from 2015 HMP	Time Frame	Completed, Deleted, or Deferred
Hazen Road & Potato Road: Replace Hazen Road culvert and increase the size to allow for increased water capacity and reduce the water back-up that causes damage to Potato Road. Increase the ditch capacity along Potato Road to hold the water and eliminate flooding the roadway.	Short Term	Partially Completed & Deferred: An HMGP application has been submitted to HSEM to improve stormwater flow on Hazen and Potato Roads. This strategy is deferred to mitigate flooding by cleaning ditches and upgrading culverts along both roadways. Action Item #15
Culvert Inventory: Complete a culvert inventory of town culverts to determine hazard culverts in the town.	Medium Term	Partially Completed & Deferred: The Enfield DPW does an excellent job cleaning and repairing drainage basins and culverts and is developing a written Culvert Replacement Plan. This strategy is deferred to complete the Culvert Replacement Plan, continue maintenance of all drainage systems, update the plan as needed and note details about any hazards (i.e., flooding) associated with the town's drainage systems. Action Item #17 (also in Table 6.1)
Household Hazardous Waste Collections: Continue to participate in HHW collections	Ongoing Throughout life of the plan	Completed & Deferred: Enfield has and continues to support household hazardous waste collections. This strategy is deferred to continue participating to ensure the proper disposal of hazardous waste materials throughout the community. Action Item #4
Clearcut Ordinance: Continue to enforce clearcutting ordinance	Ongoing Throughout life of the plan	Completed & Deferred: The Enfield Subdivision Regulations (2017), the Zoning Ordinance (2020), and the Building Codes are in good shape. Enfield's regulations address setbacks, road frontage, and the size of the lot. Regulations also address water resource availability, steep slope regulations for driveways, structures, and roads, clearcutting, erosion and sediment control, and maintaining adequate stormwater flow. This strategy is deferred to continue enforcement and review the Subdivision Regulations, the Zoning Ordinance, and the Building Codes after approval of this plan to identify possible changes to mitigate the natural hazards identified in this plan. Action Item #18 (also in Table 6.1) (combines four strategies from the last plan)
Steep Slopes Ordinance: Continue to enforce steep slopes ordinance	Ongoing Throughout life of the plan	Completed & Deferred: This action item is combined with the last plan's strategy regarding the Clearcut Ordinance (#3). See Action Item #18 in this plan.
Erosion and Sedimentation Control: Continue to enforce erosion and sedimentation controls	Ongoing Throughout life of the plan	Completed & Deferred: This action item is combined with the last plan's strategy regarding the Clearcut Ordinance (#3). See Action Item #18 in this plan.
Mobile Home Foundation Requirements: Continue to enforce building codes for mobile homes	Ongoing Throughout life of the plan	Completed & Deferred: This action item is combined with the last plan's strategy regarding the Clearcut Ordinance (#3). See Action Item #18 in this plan.
Tree Maintenance: Continue tree maintenance program	Ongoing Throughout life of the plan	Completed & Deferred: This action item is combined with the last plan's strategy regarding Utility Tree Maintenance (#14). See Action Item #6 in this plan.
Mapping and Designation of Prime Wetlands: Continue to use prime wetlands maps.	Ongoing Throughout life of the plan	Completed & Deferred: Using GIS technology, the DPW has mapped the prime wetlands in Enfield. This strategy is deferred to update wetlands and map new areas when they become evident. GIS layers may also be available online in the future. Action Item #5

Mitigation Project from 2015 HMP	Time Frame	Completed, Deleted, or Deferred
Public Education and Outreach Program: Add a link to “A Citizen’s Guide to Hazard Mitigation and Emergency Preparedness” to the Town Website; Continue to provide owners with mitigation outreach and advertise CodeRed system to get residents signed up	Ongoing Throughout life of the plan	Completed & Deferred: Although the town can provide public outreach via social media platforms or through the Enfield Listserv and its subscription email service, there is no emergency management webpage. This strategy is deferred to provide robust information and links on an emergency management web page to educate the public on general and seasonal mitigation techniques using all available social media platforms. (see Table 2.1) Action Item #9 (also in Table 6.1)
Utility Tree Maintenance: The town intends to protect Power Lines and Infrastructure by coordinating with the utility for regular maintenance and upkeep to prevent damage. Utilize the Tree Warden to identify potentially hazard trees and assist in taking measures to correct them.	Ongoing Throughout life of the plan	Completed & Deferred: As trees become damaged and threaten town roads, the DPW removes them. NH DOT (state roads), Eversource, Liberty Utilities, and the NH Electric Coop (utilities) do this as needed. This strategy is deferred to continue local tree and brush removal efforts to mitigate the effects of high wind events, ice storms, wildfires, and other natural hazards and continue participation in the Tree City program. Action Item #6 (also in Table 6.1) (combines two strategies from the last plan)
Wellhead Protection Program: Continue to facilitate the Wellhead Protection Program	Short Term	Completed & Deferred: The Enfield Water Department has identified a wellhead protection area. As suggested by the state, the town should review the wellhead protection plan to make it more compliant with state regulations and better ensure public water supply protection. Action Item #3 (also in Table 6.1)
National Flood Insurance Program: Continue to participate in the NFIP and enforce the floodplain management ordinance	Ongoing Throughout life of the plan	Completed & Deferred: The town became a member of the National Flood Insurance Program (NFIP) on May 17, 1988. The Enfield Flood Ordinance works well to successfully prohibit or force compliance for building and substantial improvements in the FEMA flood zone. The Zoning Ordinance, which contains the Flood Ordinance, was last amended in 2020. This strategy is deferred to this plan to continue compliance with the NFIP, obtain NFIP brochures to have available at the Town Hall, and provide public outreach regarding the benefits of membership in the NFIP, whether or not properties are in the FEMA floodplain. It is also deferred to provide links to the NFIP and Ready.gov and robust information on flood mitigation techniques for property owners. Action Item #11 (also in Table 6.1)
Conservation Easements in floodplains: Continue to evaluate floodplain parcels for acquisition	Evaluated Ongoing for the Life of the Plan	Completed & Deleted: The town has evaluated the risks to property within the floodplain and determined the benefits of acquisitions or easements. There are no known problems, and based on a risk assessment, the town has no plans to acquire flood-prone properties; therefore, this strategy is deleted. The Office of Strategic Initiatives (OSI) reported no repetitive loss claims.
All Health Hazards Regional Planning: Continue to participate in All Health Hazards plan updates	Ongoing Throughout life of the plan	Deleted: Following guidelines in the state public health plan, the Upper Valley Regional PHN and the MACE assist the community on all public health issues. The Enfield Health Officer attends public health meetings whenever possible. Activity with the Upper Valley Regional PHN has increased and improved during the Covid-19 pandemic. (also in Table 6.1)

Mitigation Project from 2015 HMP	Time Frame	Completed, Deleted, or Deferred
Building Code and Permit Requirements: Continue to enforce the building codes.	Ongoing Throughout life of the plan	Deleted: The Town of Enfield has a Building Inspector. The permitting process requires builders to abide by all state-adopted building codes, including the International Building Codes (IBC) and the International Residential Codes (IRC). The permitting, approval and enforcement process for new buildings or substantial improvements continues and works well in Enfield. (also in Table 6.1)
Wetlands Regulations: Continue to enforce 50' wetlands buffer	Ongoing Throughout life of the plan	Deleted: A 50' wetlands buffer that mirrors the state's requirement is included in the Zoning Ordinance. The Town of Enfield follows and exceeds the regulations detailed in the Shoreland Water Quality Protection Act. Wetland's protection continues to be recognized and enforced. (also in Table 6.1)
Dam Maintenance/Enforcement: Continue to monitor dams	Ongoing Throughout life of the plan	Deleted: Enfield has two high-hazard dams, the George Pond Dam (town) and the Smith Pond Dam (private); the EOC/Police Department and the DPW have current copies of the Emergency Action Plans for both dams. George Pond Dam does not present a significant hazard to people or structures. The Smith Pond Dam has been recently rehabbed. There is no mitigation needed at this time on either of these two dams; these dams are continuously monitored by DES, the DPW, and the private owner. (also in Table 6.1)
Rice Road Erosion: The DPW will complete repairs on Rice Road to eliminate erosion of the road that was being caused by swift water and steep slopes.	Short Term	Deleted: Erosion on Rice Road has been mitigated by the Department of Public Works. Ditches along Rice Road have been cleaned out and improved, trees that contributed to the problem were removed, and there is now an improved path for a stormwater flow. The town used local money to accomplish this action. This strategy is deleted as it is completed.

These strategies from the previous plan were discussed at planning meetings; it was determined to be unnecessary to defer them as new strategies for this plan. These action items are general in scope and consist of ongoing department activities and everyday best practices.

Construction, Road, Bridge, Culvert Maintenance Program: Continue to promote BMPs

Encourage Better Maintenance of State Roads & Increased Public Input at State Project Hearings: Continue to promote BMPs

Post Weight Limits on Roads to Prevent Damage: Continue to post roads

State Property Landslide Area: Continue to work with the State to mitigate State lands which slides into the Mascoma Lake & River

Septic System Failure Investigations: Continue septic system failure investigations program

Chapter 8: New Mitigation Strategies & STAPLEE

A. MITIGATION STRATEGIES BY TYPE

The following list of mitigation categories and possible strategy ideas was compiled from several 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 more in-depth knowledge of the community.

Prevention

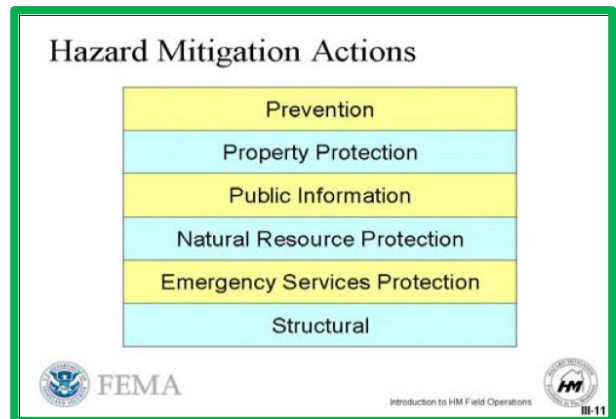
- Forest fire fuel reduction programs
- Special management regulations
- Fire Protection Codes NFPA 1
- Firewise® landscaping
- Culvert and hydrant maintenance
- Planning and zoning regulations
- Building Codes
- Density controls
- Driveway standards
- Slope development regulations
- Master Plan
- Capital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

Public Education & Awareness

- Hazard information centers
- Public education and outreach programs
- Emergency website creation
- Firewise® training
- National Flood Insurance Program (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
- Floodproofing
- Building codes
- Development regulations

Natural Resource Protection

- Best management practices within the forest
- Forest and vegetation management
- Forestry and landscape management
- Development regulations for wetlands
- 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 or realignment

B. POTENTIAL MITIGATION STRATEGIES BY HAZARD

To further promote the concept of mitigation, the team was provided with a handout 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 handout are listed below and on the following page. The planning team considered each item from this comprehensive list of possible mitigation action items to determine if any of these items could be put in place for Enfield, emphasizing new and existing buildings and infrastructure.

Strategies that may apply to more than one hazard

Type of Project

- *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*

Flood Mitigation Ideas

Type of Project

- *Stormwater 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*
- *Floodproofing* *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 & Erosion

- 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

Lightning & Hail

- Building Construction..... Property Protection

High Wind Events

- 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

Severe Winter Weather

- 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 mitigation action items and the results of the STAPLEE evaluation, as explained below. Many of these potential mitigation action items overlap. Some areas identified as “All Hazards” would also apply indirectly to wildfire response.

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 a project's social, technical, administrative, political, legal, economic, and environmental characteristics; public administration officials and planners commonly use it to make 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 potential benefits?

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

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

1 - Poor 2 - Average..... 3 - Good

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 (see section A of this chapter for 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 before an actual disaster would be listed as a potential mitigation action item. 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 primarily a management document designed to assist the Select Board 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 appropriately 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.

The town understands that the action items for a town of 200 may not be the same as those for 30,000. Also, the action items for a town in the middle of predominantly hardwood forests are not the same as the action items for a town on the Jersey Shore. Therefore the Town of Enfield 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 only this town. Furthermore, the Town of Enfield indicates that having considered a comprehensive list of possible mitigation action items (see sections A & B of this chapter) for this plan, there are no additional “Mitigation Action Items” to add time.

TABLE 8.1: POTENTIAL MITIGATION ACTION ITEMS & THE STAPLEE

Potential mitigation action items in Table 8.1 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 F: Potential Mitigation Ideas*, for more information

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #1: Improve "911" signage compliance so that emergency responders can better assist the public at the time of need. Use all available public outreach opportunities, including the town's website, the Enfield Listserv, an Emergency Management webpage, a possible brochure, available social media platforms, and local newsletters. Develop other means of increasing compliance, such as purchasing and installing signage or providing signs for residents to install themselves. (MU14) (Table 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
Action Item #2: Inspect the functionality of all hydrants and maintain and repair all hydrants and other water resources in Enfield. Consider other community areas with limited water resources and address these issues by installing new hydrants, fire ponds, and cisterns as needed. (WF8) (Table 6.1)	<u>Affected Location</u> -Dry & Pressurized Hydrants -Water resources <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #3: Review the wellhead protection plan to comply with state regulations and better protect the public water supply. (MU13) (Tables 6.1 & 7.1)	Affected Location -Wells & Water Sources	3	3	3	3	3	3	3	21
	Type of Activity -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	No apparent difficulty with this action item							
Action Item #4: Continue to actively participate in household hazardous waste collections with the Upper Valley Regional Planning Commission to ensure the proper disposal of hazardous waste materials throughout the community. The Enfield DPW coordinates with the RPC on five collection days in 2021. (Table 7.1)	Affected Location -Townwide	3	3	3	3	3	3	3	21
	Type of Activity -Prevention -Public Education & Awareness	No apparent difficulty with this action item							
Action Item #5: Use GIS technology to continue to wetland areas in Enfield and new areas of interest. Integrate GIS mapping into other projects to map known or potentially hazardous areas of the community. GIS mapping can assist with the identification of erosion (ER1) and landslide (LS1), areas prone to flooding or high winds (SW3), and even areas that are at risk for wildfires (WF1). (Table 7.1)	Affected Location -Townwide	3	3	3	3	3	3	3	21
	Type of Activity -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	No apparent difficulty with this action item							
Action Item #6: In addition to work done by and with local utility companies, monitor and maintain brush cutting and mowing, drainage system maintenance, and tree removal as part of a written tree maintenance program. Create defensible space around power lines, oil and gas lines, and other infrastructure and work to reduce wildfire risk by clearing dead vegetation, cutting high grass and other fuel loads in the community. Continue participation in the Tree City program. (SW4, WF7, WF9 & F14) (Tables 6.1 & 7.1)	Affected Location -Townwide	3	3	3	2	2	2	2	17
	Type of Activity -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	Political: Some residents may not want their trees removed Legal: Scenic road regulations must be adhered to Economical: Budget constraints Environmental: Shoreland regulations would apply							
Action Item #7: The Fire Chief, the Police Chief, and the EMD provide ongoing training for all emergency responders. Training will include the many aspects of emergency response, including EMS, wildfire suppression, HazMat, active shooter, and terrorism. Training is done locally or through the Upper Valley Mutual Aid Association and the State of New Hampshire at the NH Fire and Police Academies. (Table 6.1)	Affected Location -Townwide	3	3	3	3	3	3	3	21
	Type of Activity -Prevention -Emergency Service Protection	No apparent difficulty with this action item							
Action Item #8: The Emergency Management Director (EMD) to encourage all town officials who may be required to respond to an emergency and any new emergency responders to take NIMS 700 (S-700) & ICS (ISC100 & ISC200). Additionally, the EMD should encourage key personnel to learn about and become adept with WEB-EOC. (Table 6.1)	Affected Location -Townwide	3	3	3	3	3	3	3	21
	Type of Activity -Prevention -Emergency Service Protection	No apparent difficulty with this action item							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #9: Provide robust information on an emergency management web page, the Enfield Listserv, and social media platforms to educate the public on hazard mitigation and preparedness measures. Include preparedness information such as shelter locations, evacuation routes, methods of emergency alerting, and 911 compliance. Also include mitigation strategies such as water-saving techniques, mitigation techniques for earthquakes, tornadoes, severe winter weather, lightning, and climate change. Provide information on infectious diseases, encourage homeowners to install carbon monoxide monitors and alarms, and monitor radon in their homes. Offer residents and business owners reminders to clear snow from roofs during high accumulation snow years. (MU14, SW7, WF11, D9, T3, EQ7, ET1, ET4, L2, HA3, WW5) (Tables 6.1 & 7.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Public Education & Awareness -Property Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #10: Provide public outreach to encourage all residents to contact CodeRED to add cell numbers, unlisted numbers, and emails and verify the information. Use the community website, a possible brochure, available social media platforms, local newsletters, or a sign-up at Town Meeting. (MU14) (Table 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #11: Advise the public about the local flood hazard, flood insurance, and flood protection measures by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Hall. Give NFIP materials to homeowners and builders when proposing new development or substantial improvements. Encourage property owners to purchase flood insurance, whether or not they are in the flood zone, and provide appropriate links to the NFIP and Ready.gov on an emergency webpage or available social media platforms. Through Public Outreach, educate homeowners regarding the risks of building in the flood zone and measures to reduce flooding. Actively work with residents and builders to ensure they comply with the town's Floodplain Ordinance and ensure continued compliance with the NFIP. (F10, F22 & F23) (Tables 6.1 & 7.1)	<u>Affected Location</u> -Areas prone to flooding <u>Type of Activity</u> -Prevention -Public Education & Awareness -Property Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #12: Post important information on the town's Emergency Management webpage and notices of red flag burning days. Obtain and have available Firewise® brochures to educate homeowners on methods to reduce fire risk around their homes (WF10) and provide a link to Firewise® on the Emergency page of the town's website. Provide Firewise® brochures to those residents seeking burn permits (if not obtained on-line); advise residents of the importance of maintaining defensible space, the safe disposal of yard and household waste, and the removal of dead or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches, and yards. (WF12)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
Action Item #13: To promote private mitigation efforts, provide public outreach to the citizens of Enfield on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. These efforts will help ensure accessibility for emergency response and decrease the risk for wildfire. (MU16)	<u>Affected Location</u> -Private Roads <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
Action Item #14: Provide public outreach to the citizens of Enfield regarding the availability of the Community Center as a "cooling or warming center" during times of extended high temperatures and severe winter weather. (ET3 & WW6)	<u>Affected Location</u> -Community Center <u>Type of Activity</u> -Prevention -Public Education & Awareness	3	3	3	3	3	3	3	21
Action Item #15: Mitigate flooding and improve stormwater flow on Hazen and Potato Roads by cleaning ditches and upgrading culverts along both roadways. (F13) (Table 7.1)	<u>Affected Location</u> -Hazen & Potato Roads <u>Type of Activity</u> -Prevention -Emergency Service Protection -Structural Project	3	3	2	2	3	1	1	15
Action Item #16: Obtain approval of this hazard mitigation plan as a Community Wildfire Protection Plan (CWPP) to enable potential assistance from the state and federal governments for future wildfire mitigation projects. (WF2)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #17: Complete the development of a Culvert Replacement Plan to ensure continued maintenance of all drainage systems and improve stormwater flow. Establish mechanisms to keep the plan up-to-date and note details about any hazards associated with the drainage system. (F1 & F5) (Tables 6.1 & 7.1)	<u>Affected Location</u> -Culverts & Ditches <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #18: Review the Subdivision Regulations, the Zoning Ordinance, and the Building Codes after approval of this plan to identify possible changes that could help mitigate the natural hazards identified in this plan. (WF2, F1 & MU6) (Tables 6.1 & 7.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #19: Install one or more Fire Danger Signs at predetermined locations (perhaps at the Community Center or the Town Beach) to help inform both visitors and residents of the daily fire risk. (WF11) (Table 6.1)	<u>Affected Location</u> -Townwide at predesignated locations <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #20: Update the Enfield Emergency Operations Plan to coincide with the new state ESF format. Include an analysis of the impact of natural hazards on Critical Infrastructure & Key Resources that may be needed during an emergency. Like the current EOP, the new EOP will include an EOC Call Alert List and a detailed Resource Inventory List and Player Packets. (MU6) (Table 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #21: With the assistance of qualified personnel, inspect all town facilities to determine if an investment in lightning rods would be beneficial. Install lightning rods as recommended.	<u>Affected Location</u> -To be determined <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #22: Review the Enfield Capital Improvement Program (CIP) to ensure that the program's goals will be achieved to assist the town's departments with planned purchases or equipment and supplies. Review the CIP after approval of this plan to integrate concepts, ideas, and action items from this hazard mitigation plan. (MU6) (Table 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #23: Provide an annual review of the Enfield Hazard Mitigation Plan Update 2022, including reviewing the "Action Items" status listed in this plan to encourage completion. Obtain approval from the local elected body on an annual basis and provide a complete update of the plan in five years. (MU11) (Table 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #24: Obtain and install an emergency generator at the Enfield Community Center. A permanent generator will improve this facility's effective use during a disaster. (MU13) (Table 6.1)	<u>Affected Location</u> -Enfield Community Center <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #25: Obtain and install an emergency generator at the Enfield Village School. A permanent generator will improve this facility's effective use during a disaster. (MU13) (Table 6.1)	<u>Affected Location</u> -Enfield Village School <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	1	3	1	2	3	16
		Administrative: The School District would have to agree to the purchase of a generator Legal: The School District would have to agree to the purchase of a generator Economical: Budget constraints							
Action Item #26: Work to remove trees and brush blocking the ditch line along Bog Road to improve stormwater flow. (F13)	<u>Affected Location</u> -Ditch line along Bog Road <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #27: Explore possible backup water solutions, including connecting with the Lower Shaker Village community water system. (Table 7.1)	<u>Affected Location</u> -To be determined <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	3	3	3	2	3	1	2	17
		Political: The 2021 warrant article may not pass at Town Meeting Economical: Budget constraints Environmental: DES and other permitting will likely be required							
Action Item #28: Review this plan, the Enfield Hazard Mitigation Plan Update 2022, whenever an update or annual review of the Master Plan is done and consider the incorporation of a discussion on climate change, a natural hazards section, and mitigation action items from this plan. (MU6) (Table 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #29: Lobby FEMA to produce new and updated Digital Flood Insurance Rate Maps (DFIRMS) to replace the current maps dated February 2008 and reduce inaccuracies in the mapping.	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Public Education & Awareness	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #30: Obtain funding and construct a new Public Safety Building to house the Fire, Police, and FAST Squad. Equip the new building with the equipment needed to operate a modern Emergency Operations Center and include permanent backup generation and lightning protection in building plans. (MU13)	<u>Affected Location</u> -New Public Safety Building <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Structural Project	3	3	3	2	3	1	2	17
Action Item #31: Continue to maintain and repair all of the town-owned bridges in the community, including the Spectacle Pond outlet bridge on Lockhaven Road, the Bog Road Bridge over the Knox River, the Shaker Boulevard Bridge over Knox River, the May Street Bridge over Harris Brook, and the Oak Hill Bridge over the next 4-7 years as part of the DPW's short- and long-term schedule for bridge maintenance and repair. Oak Hill Bridge is scheduled for 2022. (MU13) (Table 6.1)	<u>Affected Location</u> -Oak Hill Road Bridge <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	2	3	2	3	3	2	2	17
Action Item #32: Review and assess the bank's condition on Crystal Lake, where the shoulder of Crystal Lake Road may become compromised. Provide rip rap or other bank stabilization techniques to mitigate further erosion and keep the bank and the road from falling into the lake. (ER5) (Table 7.1)	<u>Affected Location</u> -Crystal Lake Road <u>Type of Activity</u> -Prevention -Structural Project	1	1	3	1	3	1	1	11
Action Item #33: Explore and obtain funding to install an emergency generator at Prior #1 Well. A permanent generator will ensure the availability of public water during periods of long-term power outages. (MU13) (Table 6.1)	<u>Affected Location</u> -Prior #1 Well – Municipal Water <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	3	3	3	2	3	20

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Chapter 9: Implementation Schedule for Prioritized Action Items

A. PRIORITY METHODOLOGY

After reviewing the finalized STAPLEE numerical ratings, the team developed *Table 9.1, The Mitigation Action Plan*. To do this, team members created four categories in which to place the potential mitigation action items.

CATEGORY A

Category A includes those items which are being done and will continue to be done in the future.

CATEGORY B

Category B includes 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 C

Category C includes those items that the town does 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 13-36 months to complete.

CATEGORY D

Category D includes those items that would take a significant funding effort, those that the town has little control over the final decision, and those that would take more than 37 months to complete.

Each potential mitigation action item was placed in one of these four categories. 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. However, the team could agree on the cost-benefit for each proposed action item using the STAPLEE process and a Very Low Cost to High Cost estimate (see the following page).

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 they had brainstormed throughout the hazard mitigation planning process. While all actions would 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 to outline responsibilities, time frame, and method for implementing each action item. The following questions were asked 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 time frame is for implementation of the project (WHEN).

Once the plan is approved, the community will begin working on the action items listed in *Table 9.1, The Mitigation Action Plan* (see below and on the following pages). An estimation of completion for each action item is noted in the “Time Frame” column of Table 9.1. Some projects, including most training and education of residents on emergency and evacuation procedures, could be tied into the emergency operations plan and implemented through that planning effort.

TABLE 9.1: THE MITIGATION ACTION PLAN

Table 9.1, The Mitigation Action Plan, beginning on the following page, includes problem statements expressed by the planning team. These action items are listed by priority and indicate if they were derived from other tables in this plan.

The estimated cost was determined using the following criteria:

- **Very Low Cost** \$0 - \$1,000 or staff time only
- **Low Cost** \$1,000-\$20,000
- **Medium Cost** \$20,000-\$100,000
- **High Cost** \$100,000 or more

The time frame was determined using the following criteria:

- **Short Term** Ongoing for the life of the plan
- **Short Term** Less than one year (0-12 months)
- **Medium Term** 2-3 years (13-36 months)
- **Long-term:** 3-5 years (37-60 months)

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 F: Potential Mitigation Ideas*, for more information.

Mitigation Action Items are listed in order of priority.

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-1	<p>Problem Statement: The town has continuously used public outreach to remind residents of the need for proper "911" signage. However, the town is only about 85% compliant with the proper "911" signage.</p> <p>Action Item #1: Improve "911" signage compliance so that emergency responders can better assist the public at the time of need. Use all available public outreach opportunities, including the town's website, the Enfield Listserv, an Emergency Management webpage, a possible brochure, available social media platforms, and local newsletters. Develop other means of increasing compliance, such as purchasing and installing signage or providing signs for residents to install themselves. (MU14) (Table 6.1)</p>	All Hazards	Emergency Service Departments (Fire, Police & EMS)	Local	Short Term Ongoing (For the life of the plan)	Low Cost \$1,000-\$20,000
A-2	<p>Problem Statement: Pressurized hydrants, dry hydrants, and drafting sites throughout Enfield are utilized to provide water resources for firefighting. These systems need to be maintained to help mitigate the effects of structure and wildfires.</p> <p>Action Item #2: Inspect the functionality of all hydrants and maintain and repair all hydrants and other water resources in Enfield. Consider other community areas with limited water resources and address these issues by installing new hydrants, fire ponds, and cisterns as needed. (WF8) (Table 6.1)</p>	Wildfire & Conflagration	Department of Public Works & Fire Department	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)
A-3	<p>Problem Statement: The Enfield Water Department has identified a wellhead protection area. A review of the wellhead protection plan should be done to ensure compliance with current state wellhead regulations.</p> <p>Action Item #3: Review the wellhead protection plan to comply with state regulations and protect the public water supply better. (MU13) (Tables 6.1 & 7.1)</p>	Known & Emerging Contaminants & Aging Infrastructure	Department of Public Works	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-4	<p>Problem Statement: <i>Enfield supports the collection of household hazardous waste for residents and businesses in the community. Household hazardous waste programs need to continue.</i></p> <p>Action Item #4: Continue to actively participate in household hazardous waste collections with the Upper Valley Regional Planning Commission to ensure the proper disposal of hazardous waste materials throughout the community. The Enfield DPW coordinated with the RPC on five collection days in 2021. (Table 7.1)</p>	Hazardous Materials	Department of Public Works & the Upper Valley Regional Planning Commission	Local & Grants (for RPC)	Short Term Ongoing (For the life of the plan)	Low Cost \$1,000-\$20,000
A-5	<p>Problem Statement: <i>GIS technology is used by the Department of Public Works to map wetlands, roadways, water lines, and other vital areas and infrastructure. GIS mapping needs to continue.</i></p> <p>Action Item #5: Use GIS technology to continue to wetland areas in Enfield and new areas of interest. Integrate GIS mapping into other projects to map known or potentially hazardous areas of the community. GIS mapping can assist with the identification of erosion (ER1) and landslide (LS1), areas prone to flooding or high winds (SW3), and even areas that are at risk for wildfires (WF1). (Table 7.1)</p>	Inland Flooding	DPW	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)
A-6	<p>Problem Statement: <i>As trees become damaged and threaten power lines and structures on town roads within the right-of-way, the Department of Public Works removes them. NH DOT (state roads), Eversource, Liberty Utilities, and the NH Electric Coop (utilities) do this as needed. This work needs to continue.</i></p> <p>Action Item #6: In addition to work done by and with local utility companies, monitor and maintain brush cutting and mowing, drainage system maintenance, and tree removal as part of a written tree maintenance program. Create defensible space around power lines, oil and gas lines, and other infrastructure and work to reduce wildfire risk by clearing dead vegetation, cutting high grass and other fuel loads in the community. Continue participation in the Tree City program. (SW4, WF7, WF9 & F14) (Tables 6.1 & 7.1)</p>	High Wind Events, Wildfire, Severe Winter Weather-Ice Storms & Inland Flooding	Department of Public Works	Local	Short Term Ongoing (For the life of the plan)	<p>Very Low Cost (\$0 - \$1,000 or staff time only, basic tree trimming)</p> <p>Medium Cost (\$20,000-\$100,000, extensive tree work)</p>

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-7	<p>Problem Statement: <i>Training of all emergency responders is coordinated by the Fire Chief, Police Chief, and the EMD and includes the many aspects of emergency response. This training needs to continue.</i></p> <p>Action Item #7: The Fire Chief, the Police Chief, and the EMD provide ongoing training for all emergency responders. Training will include the many aspects of emergency response, including EMS, wildfire suppression, HazMat, active shooter, and terrorism. Training is done locally or through the Upper Valley Mutual Aid Association and the State of New Hampshire at the NH Fire and Police Academies. (Table 6.1)</p>	Wildfires, Conflagration, Hazardous Materials, Terrorism & Violence	Fire Chief, Police Chief & Emergency Management Director	Local	Short Term Ongoing (For the life of the plan)	Low Cost \$1,000-\$20,000
A-8	<p>Problem Statement: <i>Although first responders, including firefighters, have received NIMS & ICS training, not all Enfield's town officials have.</i></p> <p>Action Item #8: The Emergency Management Director (EMD) to encourage all town officials who may be required to respond to an emergency and any new emergency responders to take NIMS 700 (S-700) & ICS (ISC100 & ISC200). Additionally, the EMD should encourage key personnel to learn about and become adept with WEB-EOC. (Table 6.1)</p>	All Hazards	Emergency Management Director & Other Department Heads	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)
A-9	<p>Problem Statement: <i>Although the town can provide public outreach via social media platforms or through the Enfield Listserv and its subscription email service, there is no emergency management webpage.</i></p> <p>Action Item #9: Provide robust information on an emergency management web page, the Enfield Listserv, and social media platforms to educate the public on hazard mitigation and preparedness measures. Include preparedness information such as shelter locations, evacuation routes, methods of emergency alerting, and 911 compliance. Also include mitigation strategies such as water-saving techniques, mitigation techniques for earthquakes, tornadoes, severe winter weather, lightning, and climate change. Provide information on infectious diseases, encourage homeowners to install carbon monoxide monitors and alarms, and monitor radon in their homes. Offer residents and business owners reminders to clear snow from roofs during high accumulation snow years. (MU14, SW7, WF11, D9, T3, EQ7, ET1, ET4, L2, HA3, WW5) (Tables 6.1 & 7.1)</p>	All Hazards including Severe Wind, Drought, Earthquake, Extreme Temperatures, Hail, Lightning, Severe Winter Weather, Tornado, Wildfire & Infectious Disease	Town Manager, Emergency Management Director & all other Department Heads	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-10	<p><i>Problem Statement: CodeRED is an excellent warning system but only stores resident hardline phone numbers. Residents may not be aware that they can add cell numbers, emails, and unlisted numbers.</i></p> <p>Action Item #10: Provide public outreach to encourage all residents to contact CodeRED to add cell numbers, unlisted numbers, and emails and verify the information. Use the community website, a possible brochure, available social media platforms, local newsletters, or a sign-up at Town Meeting. (MU14) (Table 6.1)</p>	All Hazards	Town Manager & Emergency Management Director	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only) e)
A-11	<p><i>Problem Statement: Residents and Builders may not be aware of flood regulations & the availability of flood insurance through the NFIP. They also may not be aware of the risk of building in the floodplain and the steps they can take to reduce flooding.</i></p> <p>Action Item #11: Advise the public about the local flood hazard, flood insurance, and flood protection measures by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Hall. Give NFIP materials to homeowners and builders when proposing new development or substantial improvements. Encourage property owners to purchase flood insurance, whether or not they are in the flood zone, and provide appropriate links to the NFIP and Ready.gov on an emergency webpage or available social media platforms. Through Public Outreach, educate homeowners regarding the risks of building in the flood zone and measures to reduce flooding. Actively work with residents and builders to ensure they comply with the town's Floodplain Ordinance and ensure continued compliance with the NFIP. (F10, F22 & F23) (Tables 6.1 & 7.1)</p>	Inland Flooding	Town Manager & Community Development Administrator	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-12	<p>Problem Statement: Although the town does a great job using its Emergency Management webpage to promote preparedness, residents may not be aware of the steps they can take to reduce the risk of fire at their homes.</p> <p>Action Item #12: Post important information on the town's Emergency Management webpage and notices of red flag burning days. Obtain and have available Firewise® brochures to educate homeowners on methods to reduce fire risk around their homes (WF10) and provide a link to Firewise® on the Emergency page of the town's website. Provide Firewise® brochures to those residents seeking burn permits (if not obtained on-line); advise residents of the importance of maintaining defensible space, the safe disposal of yard and household waste, and the removal of dead or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches, and yards. (WF12)</p>	Wildfire & Conflagration	Town Manager, Emergency Management Director & Fire Department	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)
A-13	<p>Problem Statement: Residents may not be aware of the importance of maintaining their private roads to allow access for emergency responders and to prevent wildfire.</p> <p>Action Item #13: To promote private mitigation efforts, provide public outreach to the citizens of Enfield on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. These actions will help ensure accessibility for emergency response and decrease the risk for wildfire. (MU16)</p>	Wildfire & Conflagration	Town Manager, Emergency Management Director & all other Department Heads	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time only)
A-14	<p>Problem Statement: Public outreach has been done to advise the citizens of Enfield of the possibility of using the Community Center as a cooling shelter in times of extended high temperatures and as a warming center in times of extended cold temperature; additional public outreach needs to be done.</p> <p>Action Item #14: Provide public outreach to the citizens of Enfield regarding the availability of the Community Center as a "cooling or warming center" during times of extended high temperatures and severe winter weather. (ET3 & WW6)</p>	Extreme Temperatures & Severe Winter Weather	Emergency Management	Local	Short Term Ongoing (For the life of the plan)	Very Low Cost (\$0 - \$1,000 or staff time)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-1	<p>Problem Statement: <i>Drainage issues impact stormwater flow on Hazen and Potato Roads. An HMGP application has been submitted to HSEM for drainage work in this area.</i></p> <p>Action Item #15: Mitigate flooding and improve stormwater flow on Hazen and Potato Roads by cleaning ditches and upgrading culverts along both roadways. (F13) (Table 7.1)</p>	Inland Flooding	DPW	Local & Grants	Short Term (1 year or less: 0-12 months)	High Cost (\$100,000 or more)
B-2	<p>Problem Statement: <i>This plan, the Enfield Hazard Mitigation Plan Update, 2022, will need to be approved as Community Wildfire Protection Plan (CWPP).</i></p> <p>Action Item #16: Obtain approval of this hazard mitigation plan as a Community Wildfire Protection Plan (CWPP) to enable potential assistance from the state and federal governments for future wildfire mitigation projects. (WF2)</p>	Wildfire & Conflagration	Mapping & Planning Solutions	Local	Short Term (1 year or less: 0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
B-3	<p>Problem Statement: <i>The Enfield DPW does an excellent job cleaning and repairing drainage basins and culverts and is developing a written Culvert Replacement Plan. The Culvert Replacement Plan needs to be completed.</i></p> <p>Action Item #17: Complete the development of a Culvert Replacement Plan to ensure continued maintenance of all drainage systems and improve stormwater flow. Establish mechanisms to keep the plan up-to-date and note details about any hazards associated with the drainage system. (F1 & F5) (Tables 6.1 & 7.1)</p>	Inland Flooding	Department of Public Works	Local	Short Term (1 year or less: 0-12 months, to complete Culvert Replacement Plan) Short Term Ongoing (For the life of the plan, maintenance)	Very Low Cost (\$0 - \$1,000 or staff time only)
B-4	<p>Problem Statement: <i>Enfield's regulations, including the Subdivision Regulations, the Zoning Ordinance, and the Building Codes, address setbacks, road frontage, and the size of the lot. Regulations also address water resource availability, steep slope regulations for driveways, structures, and roads, clearcutting, erosion and sediment control, mobile homes, and maintaining adequate stormwater flow. These regulations should be reviewed upon completion of this plan.</i></p> <p>Action Item #18: Review the Subdivision Regulations, the Zoning Ordinance, and the Building Codes after approval of this plan to identify possible changes that could help mitigate the natural hazards identified in this plan. (WF2, F1 & MU6) (Tables 6.1 & 7.1)</p>	All Hazards & Wildfire	Community Development Administrator	Local	Short Term (1 year or less: 0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-5	<p><i>Problem Statement: There are no fire danger signs in Enfield.</i></p> <p>Action Item #19: Install one or more Fire Danger Signs at predetermined locations (perhaps at the Community Center or the Town Beach) to help inform both visitors and residents of the daily fire risk. (WF11) (Table 6.1)</p>	Wildfires & Conflagration	Fire Department	Local & Grants	Short Term (1 year or less: 0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
B-6	<p><i>Problem Statement: The Enfield Emergency Operations Plan (EOP) was last updated in 2015 and is now ready for a 5-year recommended update.</i></p> <p>Action Item #20: Update the Enfield Emergency Operations Plan to coincide with the new state ESF format. Include an analysis of the impact of natural hazards on Critical Infrastructure & Key Resources that may be needed during an emergency. Like the current EOP, the new EOP will include an EOC Call Alert List and a detailed Resource Inventory List and Player Packets. (MU6) (Table 6.1)</p>	All Hazards	Emergency Management Director	Local & Grants	Short Term (1 year or less: 0-12 months)	Low Cost \$1,000-\$20,000
B-7	<p><i>Problem Statement: Lightning has struck in Enfield in the past and has caused damage to electronics and power outages.</i></p> <p>Action Item #21: With the assistance of qualified personnel, inspect all town facilities to determine if an investment in lightning rods would be beneficial. Install lightning rods as recommended.</p>	Lightning	Emergency Management & Facilities Manager (Code Enforcement)	Local	Short Term (1 year or less: 0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
B-8	<p><i>Problem Statement: A review of the Enfield Capital Improvement Program (CIP) is usually a part of the annual budget review process. The Enfield CIP should be reviewed to ensure that the program's goals will assist the town's departments with planned purchases of equipment and supplies.</i></p> <p>Action Item #22: Review the Enfield Capital Improvement Program (CIP) to ensure that the program's goals will be achieved to assist the town's departments with planned purchases or equipment and supplies. Review the CIP after approval of this plan to integrate concepts, ideas, and action items from this hazard mitigation plan. (MU6) (Table 6.1)</p>	All Hazards	Select Board, the CIP Committee & All Department Heads	Local	Short Term (1 year or less: 0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-9	<p>Problem Statement: <i>This plan, the Enfield Hazard Mitigation Plan Update 2022, will require an annual review and a complete update in five years.</i></p> <p>Action Item #23: Provide an annual review of the Enfield Hazard Mitigation Plan Update 2022, including reviewing the "Action Items" status listed in this plan to encourage completion. Obtain approval from the local elected body on an annual basis and provide a complete update of the plan in five years. (MU11) (Table 6.1)</p>	All Hazards	Select Board, Town Manager & Emergency Management Director	Local	<p>Short Term (1 year or less: 0-12 months; yearly for annual review)</p> <p>Long Term (3-5 years: 37-60 months; for a complete update)</p>	<p>Very Low Cost (\$0 - \$1,000 or staff time only)</p>
C-1	<p>Problem Statement: <i>Although Enfield has emergency backup power at many of the town's Critical Infrastructure & Key Resources (CIKR), the town could benefit from a permanent generator at the Enfield Community Center, the designated primary shelter.</i></p> <p>Action Item #24: Obtain and install an emergency generator at the Enfield Community Center. A permanent generator will improve this facility's effective use during a disaster. (MU13) (Table 6.1)</p>	All Hazards	Town Manager & Emergency Management Director	Local & Grants	<p>Medium Term (1-3 years: 13-36 months)</p>	<p>Medium Cost (\$20,000-\$100,000)</p>
C-2	<p>Problem Statement: <i>Although Enfield has emergency backup power at many of the town's Critical Infrastructure & Key Resources (CIKR), the town could benefit from a permanent generator at the Enfield Village School, the designated secondary shelter.</i></p> <p>Action Item #25: Obtain and install an emergency generator at the Enfield Village School. A permanent generator will improve this facility's effective use during a disaster. (MU13) (Table 6.1)</p>	All Hazards	School District & Emergency Management	Local & Grants	<p>Medium Term (1-3 years: 13-36 months)</p>	<p>Medium Cost (\$20,000-\$100,000)</p>
C-3	<p>Problem Statement: <i>Bog Road needs extensive tree work to facilitate stormwater drainage as trees are currently blocking the ditch line.</i></p> <p>Action Item #26: Work to remove trees and brush blocking the ditch line along Bog Road to improve stormwater flow. (F13)</p>	Inland Flooding	Department of Public Works	Local	<p>Medium Term (1-3 years: 13-36 months)</p>	<p>Very Low Cost (\$0 - \$1,000 or staff time only)</p>

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
C-4	<p>Problem Statement: A backup water supply for the eastern side of Mascoma Lake needs to be established to ensure the public's water supply should one of the town's good wells go down. The 2021 Warrant includes a warrant article to seek another water source, possibly connected to the Lower Shaker Village community water system.</p> <p>Action Item #27: Explore possible backup water solutions, including connecting with the Lower Shaker Village community water system. (Table 7.1)</p>	Known & Emerging Contaminants & Aging Infrastructure	Department of Public Works	Local & Grants	Medium Term (1-3 years: 13-36 months)	High Cost (\$100,000 or more)
C-5	<p>Problem Statement: An update of the Enfield Master Plan (1995) will be presented to Enfield's citizens for approval at the 2021 Town Meeting. The town has established a Master Plan task force and has received bids to proceed.</p> <p>Action Item #28: Review this plan, the Enfield Hazard Mitigation Plan Update 2022, whenever an update or annual review of the Master Plan is done and consider the incorporation of a discussion on climate change, a natural hazards section, and mitigation action items from this plan. (MU6) (Table 6.1)</p>	All Hazards	Community Development Administrator & Planning Board	Local	Medium Term (1-3 years: 13-36 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
C-6	<p>Problem Statement: The current floodplain maps from FEMA (aka, DFIRMS, Digital Flood Insurance Rate Maps) are dated February 2008 and contain many inaccuracies.</p> <p>Action Item #29: Lobby FEMA to produce new and updated Digital Flood Insurance Rate Maps (DFIRMS) to replace the current maps dated February 2008 and reduce inaccuracies in the mapping.</p>	All Hazards Inland Flooding	Community Development Administrator	Local	Medium Term (1-3 years: 13-36 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
D-1	<p>Problem Statement: A new Public Safety Building is necessary to accommodate the needs of modern Police, Fire, and EMS departments and the increased size of fire apparatus.</p> <p>Action Item #30: Obtain funding and construct a new Public Safety Building to house the Fire, Police, and FAST Squad. Equip the new building with the equipment needed to operate a modern Emergency Operations Center and include permanent backup generation and lightning protection in building plans. (MU13)</p>	All Hazards Wildfire & Conflagration Lightning	Town Manager & Select Board	Local & Grants	Long Term (3-5 years: 37-60 months)	High Cost (\$100,000 or more)

Final Priority	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
D-2	<p>Problem Statement: The Enfield Department of Public Works has established a short and long-term schedule for bridge maintenance and replacement for the 12 town-owned bridges in town. Four specific bridges are scheduled for repair within four to seven years. These bridges include the Spectacle Pond outlet bridge on Lockhaven Road, the Bog Road Bridge over the Knox River, the Shaker Boulevard Bridge over Knox River, and the May Street Bridge over Harris Brook. The Oak Hill Road Bridge, the only town-owned red-listed bridge, will be repaired in 2021.</p> <p>Action Item #31: Continue to maintain and repair all of the town-owned bridges in the community. Specifically, repair the Spectacle Pond outlet bridge on Lockhaven Road, the Bog Road Bridge over the Knox River, the Shaker Boulevard Bridge over Knox River, and the May Street Bridge over Harris Brook over the next 4-7 years as part of the DPW's short- and long-term schedule for bridge maintenance and repair. Oak Hill Bridge is scheduled for 2022. (MU13) (Table 6.1)</p>	Inland Flooding	Department of Public Works	Local	Long Term (3-5 years: 37-60 months)	High Cost (\$100,000 or more)
D-3	<p>Problem Statement: There is evidence that the bank of Crystal Lake is starting to slide, which could cause the shoulder of Crystal Lake Road to collapse.</p> <p>Action Item #32: Review and assess the bank's condition on Crystal Lake, where the shoulder of Crystal Lake Road may become compromised. Provide rip rap or other bank stabilization techniques to mitigate further erosion and keep the bank and the road from falling into the lake. (ER5) (Table 7.1)</p>	Landslide & Erosion	Department of Public Works	Local & Grants	Long Term (3-5 years: 37-60 months)	High Cost (\$100,000 or more)
D-4	<p>Problem Statement: Although Enfield has emergency backup power at many of the town's Critical Infrastructure & Key Resources (CIKR), the town could benefit from a permanent generator at Prior #1 Well to ensure the public water supply.</p> <p>Action Item #33: Explore and obtain funding to install an emergency generator at Prior #1 Well. A permanent generator will ensure the availability of public water during periods of long-term power outages. (MU13) (Table 6.1)</p>	All Hazards	Department of Public Works	Local & Grants	Long Term (3-5 years: 37-60 months)	Medium Cost (\$20,000-\$100,000)

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. It will incorporate periodic monitoring and evaluation mechanisms to review successes and failures or even simple updates.

The Enfield Hazard Mitigation Plan Update 2022 is considered a work in progress. Three situations will prompt revisiting this plan:

- *First, as a minimum, it will be reviewed annually or after a disaster to assess whether the existing and suggested mitigation action items were successful. This review will assess the plan's effectiveness, accuracy, and completeness in monitoring the implementation action items. The review will also address recommended improvements to the plan as contained in the FEMA plan review checklist and 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 significant 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 all future reviews or updates of this plan. The Emergency Management Director is responsible for initiating plan reviews and will consult with the hazard mitigation planning team identified in this plan. Before any review or update, public notice will be given through press releases in local papers or using available social media; public notice will ensure that all comments and revisions from the public and stakeholders will be considered.

Review forms 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 that occur after the development of this plan. Forms are available for years 1-4, expecting 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. Enfield completed its last hazard mitigation plan in 2015 and has completed many projects from that plan. Examples of these can be found in Table 7.1 and include updating Subdivision Regulations, improving stormwater flow on Hazen and Potato Roads, ensuring private roads are maintained, and ongoing tree trimming on roadways. The town was able to integrate these actions into other town activities, budgets, plans, and mechanisms.

The town will incorporate elements from this plan into the following documents:

ENFIELD MASTER PLAN

Traditionally, Master Plans are updated every 5 to 10 years and detail the use of capital reserve funds and capital improvements. A complete update of the Enfield Master Plan was completed in 1995 and is currently being updated. Future updates of the Master Plan may include a natural hazards section and a discussion about climate change; updates will also integrate concepts, ideas, and action items from this hazard mitigation plan. **(Action Item #28)**

ENFIELD EMERGENCY OPERATIONS PLAN 2015 (EOP)

The EOP is designed to allow the town to respond more effectively to disasters and mitigate the risk to people and property. EOPs are generally reviewed after each hazardous event and updated on a five-year basis. The last Enfield EOP was completed in 2015. An update for the Emergency Operations Plan is expected to be completed in 2022 or 2023. The new EOP will include elements from this hazard mitigation plan. **(Action Items #20)**

TOWN BUDGET & CAPITAL RESERVE FUNDS

Enfield maintains a Capital Improvement Plan and Capital Reserve Funds (CRF) for major expenditures. Capital Reserve Funds are adjusted annually in coordination with the Select Board 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 action items requiring local money, match money, or address the CIP and CRF (multiple action items).**

THE ENFIELD ORDINANCES & SUBDIVISION REGULATIONS

As time goes by and the town's needs change, the existing planning mechanisms will be reviewed and updated. The Planning Board will review this plan and incorporate any changes that help mitigate the community's susceptibility and its citizens to the dangers of natural, technical, or human-caused disasters. An example of this integration can be seen in this plan's mitigation action items. **(Action Item #18)**

The local governments will modify other plans and actions as necessary to incorporate hazard or wildfire issues. The town will review and note instances when this has been done and include it as part of their annual plan review. The Select Board ensures this process will be followed in the future.

C. PLAN APPROVAL & ADOPTION

This plan was completed in a series of open meetings beginning on June 15, 2020. The plan was presented to the town for review, submitted to HSEM for Conditional Approval (APA, Approved Pending Adoption), formally adopted by the Select Board, and resubmitted to HSEM for Final Approval. Once Final Approval from HSEM was met, copies of the plan were distributed to the town, HSEM, FEMA, DNCR, 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 digital and paper formats.

Chapter 11: Signed Community Documents and Approval Letters

A. PLANNING SCOPE OF WORK & AGREEMENT

PLANNING SCOPE OF WORK & AGREEMENT

HAZARD MITIGATION PLAN UPDATE



PARTIES TO THE AGREEMENT

Mapping and Planning Solutions
Town of Enfield, NH

Current Plan Expiration: 8/16/2020
PDM18 Grant Expiration: 4/1/2022

This agreement between the Town of Enfield (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 Enfield 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 town 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 town. 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 (also known as Approved Pending Adoption or APA) is received from Homeland Security & Emergency Management (HSEM). 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. All adopted plans should address mitigation strategies for reducing the risk of natural, technological, and human-caused disasters on life and property and written so that they may be integrated within other town planning initiatives.

Scope of Work

MAPS - 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 Plan Review Tool by working with the planning team (the team) and taking public input from community members.
- With the assistance of the team, MAPS will coordinate and facilitate six to seven two-hour meetings and provide any materials, handouts, and maps necessary to provide a full understanding of each step in the planning process. These meetings may be held online or in-person, depending on COVID-19 conditions at the time.
- MAPS will assist the team in the development of goals, objectives, and implementation strategies 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 town'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 HSEM for conditional approval. Upon conditional approval by HSEM, MAPS will assist the planning team as needed and will 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 Enfield Hazard Mitigation Plan.
- Once final documents are received, the plan will be printed and distributed by MAPS. The final documents include the HSEM formal approval email, the FEMA formal letter of approval, and the approved Community Wildfire Protection Plan (CWPP) documents. MAPS will provide the town with two copies of the plan containing all signed documents and approvals along with CDs containing these same documents in digital form for distribution by the town as it sees fit. Additional CDs may be requested at no additional cost. CD copies of the plan will be distributed by MAPS to collaborating agencies, including, but not limited to, HSEM, FEMA, the Department of Natural and Cultural Resources (DNCR), and the US Forest Service.
- MAPS will provide all "Quarterly Reports" that are required by HSEM for the duration of this project. These quarterly reports will be done online, and a copy of the report will be forwarded to the primary contact for Enfield.
- MAPS will provide plan maintenance reminders on an annual basis leading up to the next five-year plan update at no cost to the town.
- Understanding that emergencies can and do happen, MAPS will make every effort to proceed with meetings. However, the town shall ensure that attendance at any given meeting is adequate to proceed with the meeting. MAPS reserves the right to invoice the town for travel, meal expenses, and staff costs that are incurred when meeting attendance is inadequate.

The Town - Responsibilities include but are not limited to the following:

- The town shall ensure that the planning team includes members who are able to support the planning process by identifying available town resources including people who will have access to and can provide pertinent data. The planning team should include, but not be limited to, such town members as the local Emergency Management Director, the Fire, Ambulance and Police Chiefs, members of the Select Board and the Planning Board, the Director of Public Works or Road Agent, representatives from relevant federal and state organizations, other local officials, property owners, and relevant businesses or organizations.
- The town shall determine a lead contact to work with MAPS. 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 addition, this contact shall assist MAPS with organizing public meetings to develop the plan and offer assistance to MAPS 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 Select Board for consideration and adoption.

- After adoption and final approvals are 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 community and ensure citizen awareness.*
 - *Urge the Planning Board to incorporate priority projects into the town's Capital Improvement plan (if available).*
 - *Integrate mitigation strategies and priorities from the plan into other town planning documents.*

Terms

- **Fees & Payment Schedule:** The contract price is limited to \$7,500; an invoice will be sent to the town for each payment as outlined below.

1. Initial payment upon signing of this scope and receipt of first invoice.....	\$3,500.00
2. Second payment upon plan submittal to HSEM for APA	\$3,700.00
3. Final payment upon project completion and receipt of final plan copy	<u>\$300.00</u>
Total Fees.....	\$7,500.00

- **Payment Procedures:** The payment procedure is as follows:

- MAPS will invoice the town
- The town will pay MAPS
- Once an appropriate amount of “match” has been achieved, the town will forward the MAPS invoice along with an invoice from the town on letterhead to HSEM
- HSEM will reimburse the town for the monies paid to MAPS

All payments to MAPS are fully reimbursable to the town by Homeland Security & Emergency Management.

- **Required Matching Funds:** The total cost for this project under PDM18 is \$10,000 with a federal share of \$7,500 and a match amount of \$2,500 (75%/25% split). Matching funds are the responsibility of the Town of Enfield, not MAPS. The town will be responsible to provide and document any and all resources to be used to meet the FEMA required match. 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 a date yet to be determined or whenever the planning process is complete. The project period may be extended by mutual written agreement between the town, MAPS, and Homeland Security if required. The actual project end date is dependent upon timely adoptions and approvals which may be outside of the control of MAPS and the town.

The grant provided for this project is funded through PDM18; per the grant agreement between the town and HSEM, all work must be completed by April 1, 2022. It is expected that this project will be completed long before the grant expiration date of April 1, 2022.

- **Ownership of Material:** All 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 Enfield. 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 HSEM and FEMA, relieve MAPS of content liability. Mapping and Planning Solutions carries annual general liability insurance and workmen's comp insurance.
- **Amendments:** Changes, alterations, or additions to this agreement may be made if agreed to in writing between both the Town of Enfield and Mapping and Planning Solutions.
- **About Mapping and Planning Solutions:** Mapping and Planning Solutions provides hazard mitigation and emergency operations planning throughout New Hampshire. Mapping and Planning Solutions has developed more than 65 Hazard Mitigation Plans, more than 65 Emergency Operations Plans and has completed the following courses in Emergency Preparedness, Planning, and Operations:
 - Introduction to Incident Command System, IS-100.a
 - ICS Single Resources and Initial Action Incidents, IS-200.a
 - National Incident Management System (NIMS) An Introduction, IS-700.a
 - National Response Framework, An Introduction, IS 800.b
 - Emergency Planning, IS-235
 - Homeland Security Exercise & Evaluation Program (HSEEP)
 - IS-547.a – Introduction to Continuity Operations
 - IS-546.a – Continuity of Operations (COOP) Awareness Course
 - G-318; Preparing & Review Hazard Mitigation Plans
 - Climate Change Adaptation Planning, AWR-347
 - ALICE; School Shooting Workshop, Littleton High School
 - L0550 Continuity Planners Workshop (2320EM1216)

➤ **Contacts:**

For Mapping & Planning Solutions

June Garneau
Mapping and Planning Solutions
105 Union Street
Whitefield, NH 03598
jgarneau@mappingandplanning.com
(603) 837-7122; (603) 991-9664 (cell)

For the Town

Roy Holland, Police Chief & EMD
Town of Enfield
19 Main Street, PO Box 365
Enfield, NH 03748
(603) 632-7501
rholland@enfield.nh.us

Signature below indicates acceptance of and Agreement to details outlined in this Agreement

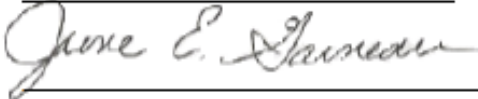
FOR THE TOWN OF ENFIELD, NH

Signature

Printed Name/Title

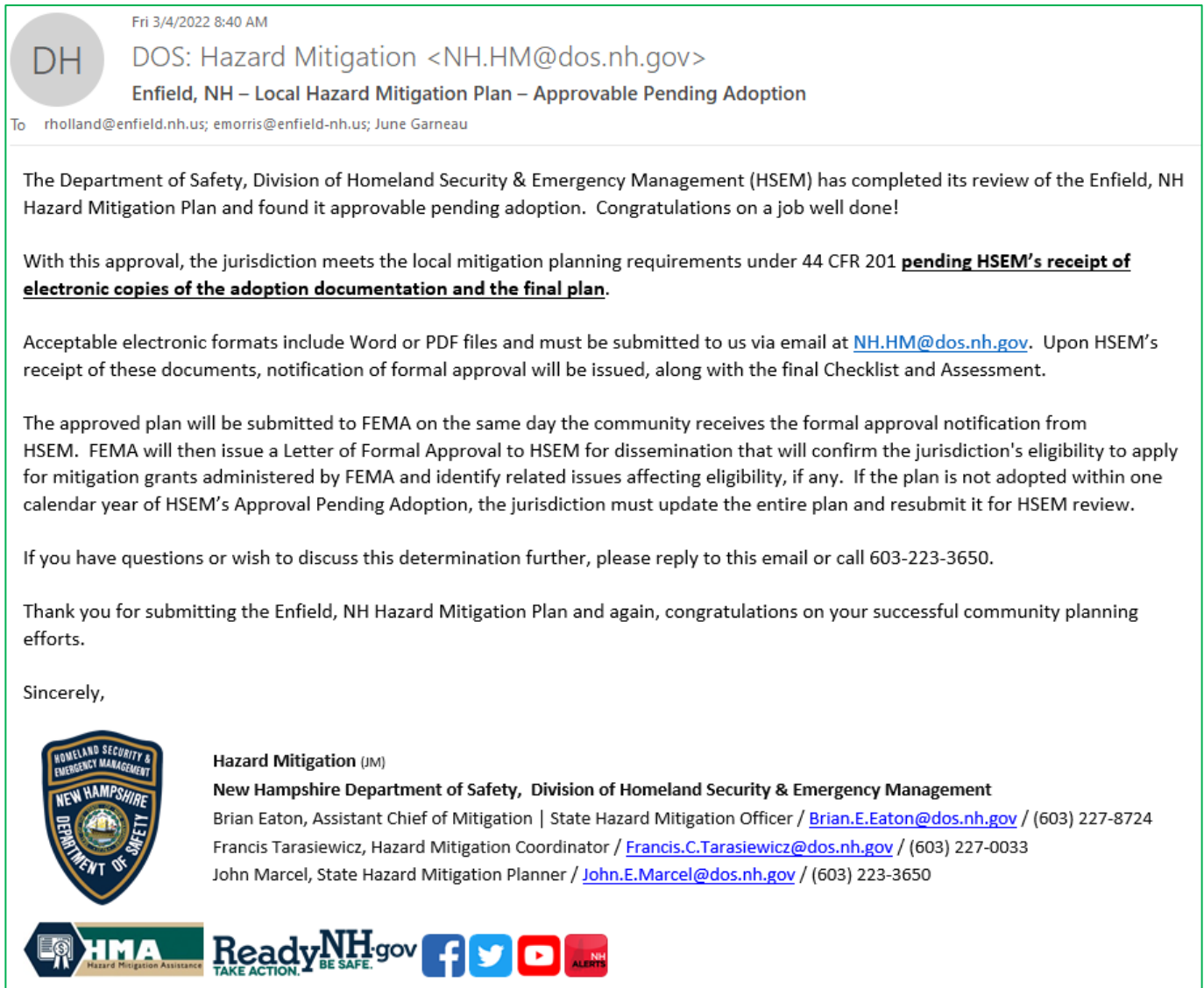
Date

FOR MAPPING AND PLANNING SOLUTIONS



Signature
June Garneau, Owner
April 29, 2020

Signatures are scanned facsimiles; original signatures are on file.

B. APPROVED PENDING ADOPTION (APA) & FORMAL APPROVAL EMAILS FROM HSEM**APA FROM HSEM**

Signatures are scanned facsimile; original signatures are on file.

FORMAL APPROVAL FROM HSEM

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HSEM

Signatures are scanned facsimile; original signatures are on file.

C. SIGNED CERTIFICATE OF ADOPTION

CERTIFICATE OF ADOPTION

ENFIELD, NH

SELECT BOARD

A RESOLUTION ADOPTING THE TOWN OF ENFIELD HAZARD MITIGATION PLAN UPDATE 2022

WHEREAS the Town of Enfield 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 Enfield has developed and received conditional approval from the Homeland Security & Emergency Management (HSEM) for its Hazard Mitigation Plan Update 2022 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between June 15, 2020, and April 8, 2021, regarding the development and review of the Hazard Mitigation Plan Update 2022 and

WHEREAS, the plan specifically addresses hazard mitigation strategies and plan maintenance procedures for the Town of Enfield; and

WHEREAS, the plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Enfield 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 Enfield eligible for funding to alleviate the impacts of future hazards; now, therefore, be it

RESOLVED by the Select Board:

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

Enfield, 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 five (5) years from the date of this resolution;
4. An annual report on the progress of the plan's action items shall be presented to the Select Board by the Emergency Management Director.

Adopted this day, the _____ of _____, 2022

Select Board Chair

Signature

Print Name

Member of the Select Board

Signature

Print Name

Member of the Select Board

Signature

Print Name

Emergency Management Director

Signature

Print Name

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Enfield on this day, _____, 2022

Notary

Expiration

Dates

Signatures are scanned facsimile; original signatures are on file.

D. FORMAL APPROVAL LETTER FEMA

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FEMA

Signatures are scanned facsimile; original signatures are on file.

E. CWPP APPROVAL LETTER FROM DNCR

**Enfield, NH
A Resolution Approving the
Enfield Hazard Mitigation Plan Update 2022
As a Community Wildfire Protection Plan**

Several public meetings and committee meetings were held between June 15, 2020, and April 8, 2021, regarding the development and review of the Enfield Hazard Mitigation Plan Update 2022. The Enfield Hazard Mitigation Plan Update 2022 contains potential future projects to mitigate hazard and wildfire damage in the Town of Enfield.

The Fire Chief, along with the Select Board and the Emergency Management Director, desires that this plan be accepted by the Department of Natural and Cultural Resources (DNCR) as a Community Wildfire Protection Plan, having adhered to the requirements of said plan.

The Select Board, the Emergency Management Director, and the Fire Chief approve the Enfield Hazard Mitigation Plan Update 2022 and understand that with approval by DNCR, this plan will also serve as a Community Wildfire Protection Plan.

For the Town of Enfield

APPROVED and SIGNED this day, _____, 2022.

_____ Chairman of the Select Board	_____ Printed Name
_____ Emergency Management Director/PC*****	_____ Printed Name
_____ Fire Chief	***** Printed Name

For the Department of Natural & Cultural Resources (DNCR)

APPROVED and SIGNED this day, _____, 2022.

 Forest Ranger – NH Division of Forest and Lands, DNCR

APPROVED and SIGNED this day, _____, 2022.

 Steve Sherman, Chief, Forest Protection Bureau – NH Division of Forests & Lands, DNCR

Signatures are scanned facsimile; original signatures are on file.

F. ANNUAL OR POST HAZARD REVIEW FORMS

YEAR ONE - Annual or Post Hazard Review Form

CHECK ALL THAT APPLY

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

After inviting the public and stakeholders to attend hearings, this page shall be executed annually by the town's governing body and the town's designated Emergency Management Director.

Enfield, 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 2022 Hazard Mitigation Plan Update

Please use the reverse side for additional notes 

Additional Notes – Year One:

[illegible]

YEAR TWO - Annual or Post Hazard Review Form

CHECK ALL THAT APPLY

☐ Annual Review - **Year Two**: _____ (Date)

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

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

After inviting the public and stakeholders to attend hearings, this page shall be executed annually by the town's governing body and the town's designated Emergency Management Director.

Enfield, 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 2022 Hazard Mitigation Plan Update

Please use the reverse side for additional notes 

Additional Notes – Year Two:

[illegible]

YEAR THREE - Annual or Post Hazard Review Form

CHECK ALL THAT APPLY

☐ Annual Review - **Year Three:** _____ (Date)

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

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

After inviting the public and stakeholders to attend hearings, this page shall be executed annually by the town's governing body and the town's designated Emergency Management Director.

Enfield, 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 2022 Hazard Mitigation Plan Update

Please use the reverse side for additional notes 

Additional Notes – Year Three:

[illegible]

YEAR FOUR - Annual or Post Hazard Review Form

CHECK ALL THAT APPLY

☐ Annual Review - **Year Four:** _____ (Date)

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

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

After inviting the public and stakeholders to attend hearings, this page shall be executed annually by the town's governing body and the town's designated Emergency Management Director.

Enfield, 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 2022 Hazard Mitigation Plan Update

Please use the reverse side for additional notes 

Additional Notes – Year Four:

[illegible]

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: MAJOR DISASTER & EMERGENCY DECLARATIONS
- APPENDIX E: ACRONYMS
- APPENDIX F: POTENTIAL MITIGATION IDEAS

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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
- **Hazard Mitigation Assistance Guidance**, FEMA, February 27, 2015
- **Hazards Mitigation Plans**
 - Enfield Hazard Mitigation Plan, 2015
 - Holderness Hazard Mitigation Plan, 2022¹
 - Woodstock Hazard Mitigation Plan, 2020
 - Bethlehem Hazard Mitigation Plan, 2021
- **NH State Multi-Hazard Mitigation Plan**, 2018
 - https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf
- **NH Division of Forests and Lands Quarterly Update**
 - <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
 - <http://www.fema.gov/library/viewRecord.do?id=1935>
- **Economic & Labor Market Information Bureau**, NH Employment Security, January 2021; Community Response for Enfield, Received, 7/30/2020, Census 2000 and Revenue Information derived from this site;
 - <http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Enfield.htm>

Photos

- Photos are taken by MAPS unless otherwise noted.

Map Snips

- Map snips are created by MAPS using readily available data from NH Granit unless otherwise indicated

Wildfire Links

- US Forest Service; <http://www.fs.fed.us>
- US Fire Administration; <http://www.usfa.dhs.gov/>
- US Department of Agriculture Wildfire Programs: <http://www.wildfireprograms.usda.gov/>
- Firewise®; <http://www.firewise.org/>
- Fire Adapted Communities; www.fireadapted.org
- Wildfire Preparedness Guide to Forest Wardens; www.quickseries.com
- Ready Set Go; www.wildlandfires.org
- Fire education for children; www.smokeybear.com

Additional Websites

- 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>
- National Weather Service; http://www.nws.noaa.gov/om/cold/wind_chill.shtml
- Center for Disease Control; <https://www.cdc.gov/disasters/winter/index.html>
- Slate; <http://www.slate.com/id/2092969/>
- NH Bureau of Economic Affairs; <http://www.nh.gov/osi/planning/index.htm>
- Code of Federal Regulations; Title 14, Aeronautics and Space; Part 1, Definitions and Abbreviations;
https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title14/14tab_02.tpl
- Federal Aviation Administration; <http://faa.custhelp.com>
- US Legal, Inc.; <http://definitions.uslegal.com/v/violent-crimes/>

APPENDIX B: TECHNICAL & FINANCIAL ASSISTANCE FOR HAZARD MITIGATION

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding 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 programs³⁴:

- 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 programs 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.

A. Hazard Mitigation Grant Program (HMGP)

HMGP assists in implementing long-term hazard mitigation measures following Major Disaster Declarations. Funding is available to implement projects following 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	✓	✓	✓
Generators	✓	✓	
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-localized Flood Risk 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	✓		
Advance Assistance	✓		
5 Percent Initiative Projects	✓		
Miscellaneous/Other ⁽¹⁾	✓	✓	✓
2. Hazard Mitigation Planning	✓	✓	✓
Planning Related Activities	✓		
3. Technical Assistance			✓
4. Management Cost	✓	✓	✓

⁽¹⁾ Miscellaneous/Other indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available.

Eligibility Chart taken from Hazard Mitigation Assistance Guidance, February 27, 2015

³⁴ Information in Appendix B is taken from the following website and links to specific programs unless otherwise noted http://www.fema.gov/media-library-data/1424983165449-38f5dfc69c0bd4ea8a161e8bb7b79553/HMA_Guidance_022715_508.pdf

What is the Hazard Mitigation Grant Program?

The Hazard Mitigation Grant Program (HMGP) grants 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 major 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 regarding the most effective use of grant funds.

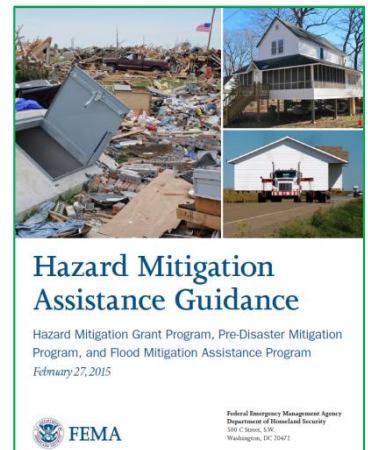
B. Building Resilient Infrastructure and Communities (BRIC) (former Pre-Disaster Mitigation program)

BRIC provides funds annually for hazard mitigation planning and the implementation of mitigation projects before a disaster. The goal of the BRIC 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 BRIC program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects before a disaster event.

Funding these plans and projects reduces overall risks to the population and structures while reducing reliance on funding from actual disaster declarations. BRIC 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 the 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 in implementing 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 two 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 annually 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 annually 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 ten 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.

**For further information all of these programs, please refer to
the new FEMA Hazard Mitigation Assistance Guidance:**

http://www.fema.gov/media-library-data/1424983165449-38f5dfc69c0bd4ea8a161e8bb7b79553/HMA_Guidance_022715_508.pdf

APPENDIX C: THE EXTENT OF NATURAL HAZARDS

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

*SEVERE WINTER WEATHER

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

Snowstorms

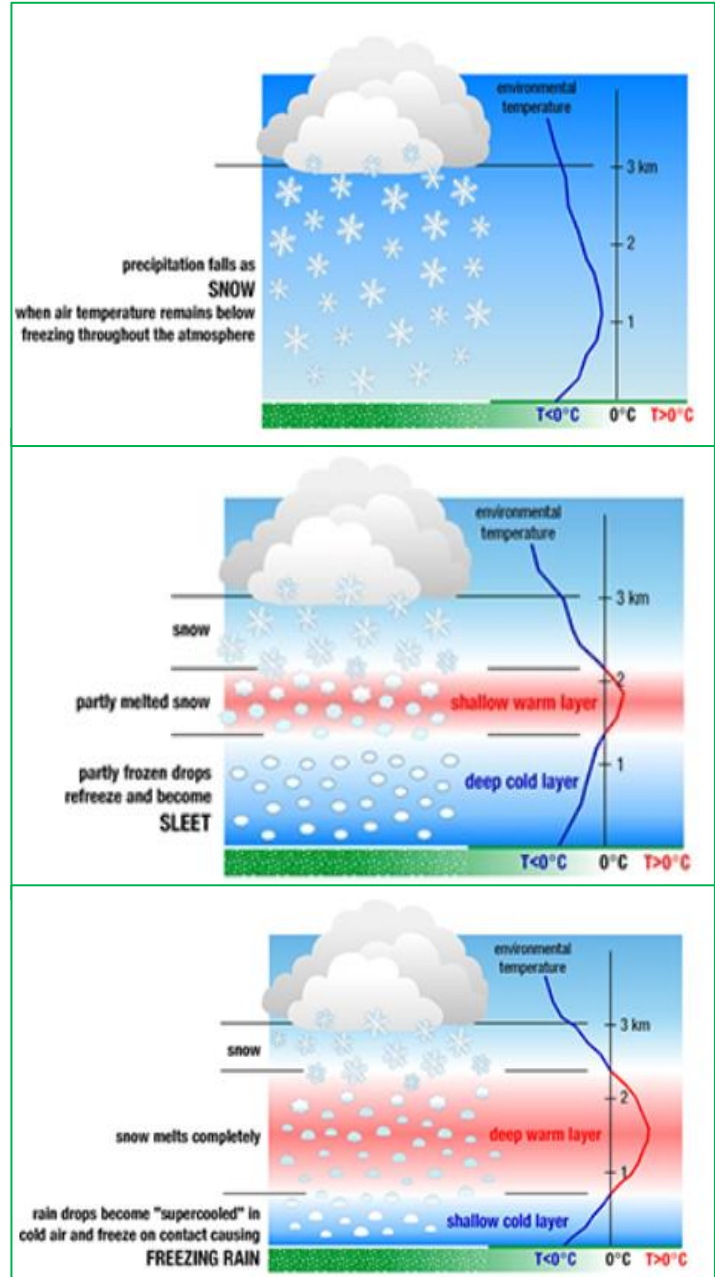
A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow for 12 hours or six inches of snow for 24 hours.

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 raindrops then fall to the ground as “sleet”.

Freezing Rain & Ice Storms

Snowflakes melt 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 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.”³⁵



³⁵ 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.³⁶

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	

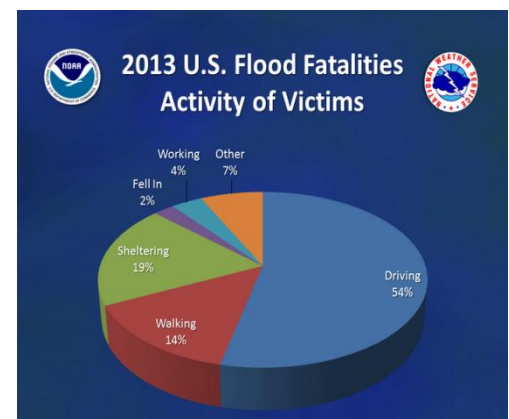
(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

*INLAND FLOODING

General Flooding Conditions

Floods are defined as a temporary overflow of water onto lands that are not usually covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, 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 snowmelt; however, floods can occur at any time. 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 flood conditions. Also, rising waters in early spring often break the ice into chunks that float downstream and pile up, causing flooding behind them. Small rivers and streams pose unique flooding risks because jams easily block them. Ice in riverbeds and against structures presents a significant flooding threat to bridges, roads, and the surrounding lands.



³⁶ The Weather Channel, <http://www.weather.com/news/weather-winter/rating-ice-storms-damage-sperry-piltz-20131202>

Flooding (Dam Failure)

Flooding due to dam failure can be small enough only to affect the immediate area of the dam or large enough to cause catastrophic results to cities, towns, and human life below the dam. The amount of flooding depends mainly on the dam's size and the amount of water 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 are also factors

A "Dam" means any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acres or more, or is located at the outlet of a great pond³⁷. A dam failure occurs when water overtops the dam, or there is a structural failure of the dam, which causes there to be a breach and an unintentional release of water. Dams are classified in the following manner³⁸:

Classification	Description	Inspection Intervals
Non-Menace	A dam is not a menace because it is in a location and size that failure or misoperation of the dam would not result in probable loss of life or loss to property. The dam must be less than six feet in height if the storage capacity is greater than 50 acre-feet or less than 25 feet in height if it has a storage capacity of 15-50 acre-feet.	Every six years
Low Hazard	A dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in no possible loss of life, low economic loss to structures or property, structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassable or otherwise interrupt public safety services, the release of liquid industrial, agricultural, or commercial wastes, septage, or contained sediment if the storage capacity is less two-acre-feet and is located more than 250 feet from a water body or watercourse, and/or reversible environmental losses to environmentally-sensitive sites.	Every six years
Significant Hazard	A dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in no probable loss of lives; however, there would be a major economic loss to structures or property, structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services, major environmental pro-public health losses including one or more of the following: damages to a public water system (RSA 485:1-a, XV) which will take longer than 48 hours to repair, the release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is two acre-feet or more; or damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.	Every four years
High Hazard	A dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as well as a result of water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure which is occupied under normal conditions; water levels rising above the first-floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to a dam failure is greater than one foot; structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services; the release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII; or any other circumstance that would more likely than not cause one or more deaths.	Every two years

³⁷ NH DES http://des.nh.gov/organization/divisions/water/dwgb/wrpp/documents/primer_chapter11.pdf

³⁸ <http://des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf>

Flooding (local, road erosion)

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. Heavy rain, rapid snowmelt, and stream flooding often cause culverts to be overwhelmed and roads to wash out. In addition, inadequate and aging stormwater drainage systems create local flooding on asphalt and gravel roads.

Flooding (Riverine)

Floodplains are usually located in lowlands near rivers; floodplains experience flooding regularly. The term 100-year flood does not mean that floods 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 “1% annual chance flood”. Flooding is often associated with hurricanes, heavy rains, ice jams, and rapid snowmelt in the spring.

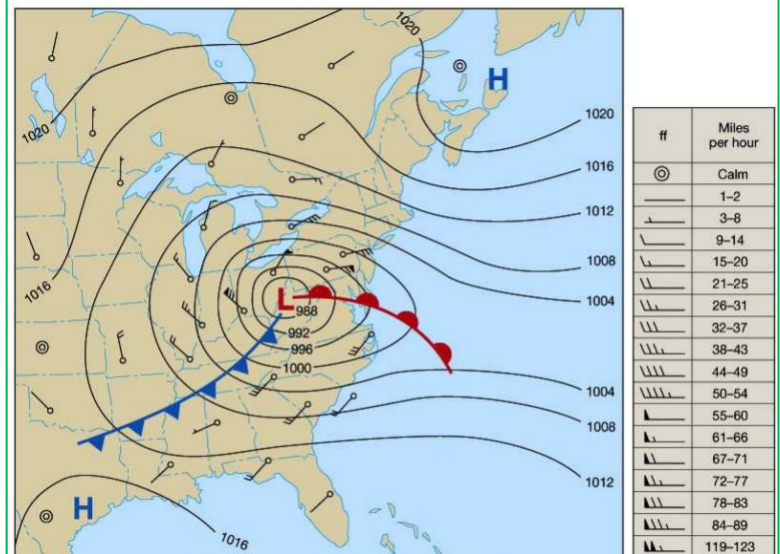
*HIGH WIND EVENTS

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. Air pressures higher in one place than another set up a force pushing from the high pressure toward the low pressure. The more significant the difference in pressures, the stronger the force. The distance between high and 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. No set number divides high and low pressure. Wind is used to describe the prevailing direction from which the wind is blowing with speed given usually in miles per hour or knots.” Also, NOAA’s issuance of a Wind Advisory occurs when sustained winds reach 25 to 39 mph and gusts to 57 mph.^{39 40}

Pressure Gradient Force, PGF

The Pressure Gradient Force (PGF) is the direct result of different air pressures. As we have done for temperature by drawing isothermal maps, we can do for pressure and draw isobaric maps. Lines on these maps connect points of equal pressure.



Pressure Gradient Force (PGF) resulting in winds generated between pressure differences. Solid lines are isobars - lines of constant pressure.

Figure 6.9 in *The Atmosphere*, 8th edition, Lutgens and Tarbuck, 8th edition, 2001.

³⁹ NOAA; <http://www.nws.noaa.gov/glossary/index.php?letter=w>

⁴⁰ Pressure Gradient Force Chart “snipped” from *Air Pressure and Wind*; https://www.weather.gov/media/zhu/ZHU_Training_Page/winds/pressure_winds/pressure_winds.pdf

Tornado

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

Tornadoes produce the most violent winds on earth at speeds of 280 mph or more. Also, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be more than 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. A tornado covers a much smaller area than a hurricane 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 introducing the Fujita Scale in 1971. The new scale identifies 28 different free-standing structures most affected by tornadoes considering 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.”⁴¹ The chart (right), adapted from wunderground.com, compares the Fujita Scale to the Enhanced Fujita Scale.

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 have 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 the ground.
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 thrown 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 a maximum wind speed in excess of EF5 occur, the extent and types of damage may not be conceivable. A number of missiles, such as iceboxes, water heaters, storage tanks, automobiles, etc., will create secondary damage to structures.

⁴¹ Enhance Fujita Scale, http://www.wunderground.com/resources/severe/fujita_scale.asp

Downburst

According to NOAA, a downburst is a strong downdraft that causes damaging winds on or near the ground. Not to be confused with a downburst, the term "microburst" describes the size of the downburst. Comparing 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.⁴²

Below is the Beaufort Wind Scale, showing expected damage based on the wind (knots), developed in 1805 by Sir Francis Beaufort of England and posted on NOAA's Storm Prediction Center website.⁴³

Force	Wind (Knots)	WMO Classification	The 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 the 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 the wind
9	41-47	Strong Gale	High waves (20 ft.), the 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 the sea, visibility more reduced	
12	64+	Hurricane	Air-filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

⁴² NOAA - <http://www.srh.noaa.gov/jetstream/tstorms/wind.html>

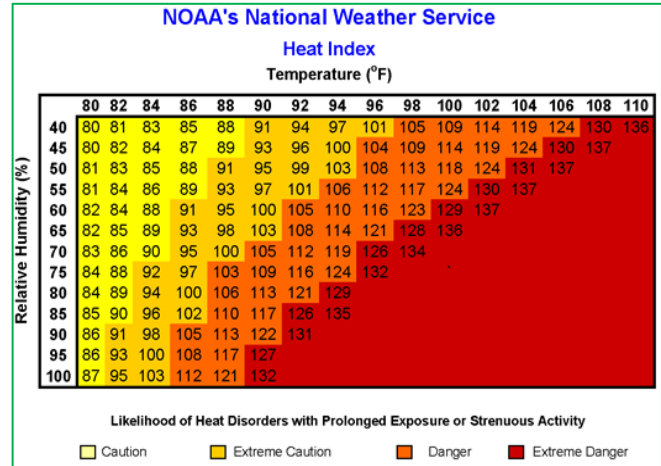
⁴³ NOAA, Storm Prediction Center, <http://www.spc.noaa.gov/faq/tornado/beaufort.html>

***EXTREME TEMPERATURES**

Extreme Heat

A heatwave 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.

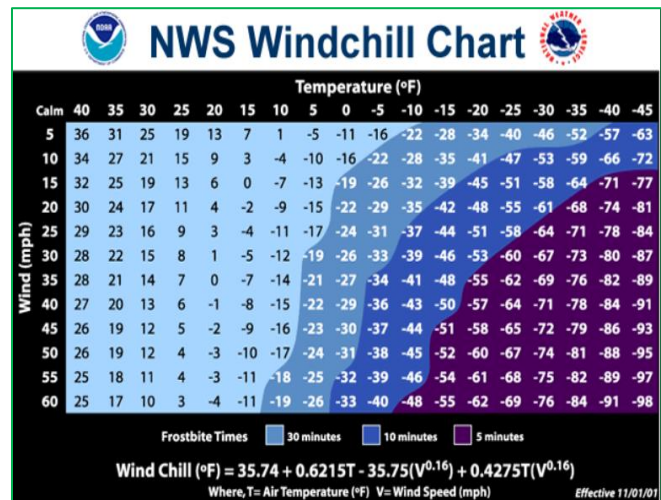
Most heat disorders occur when a victim is overexposed to heat or has over-exercised for their age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.



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, producing higher nighttime temperatures known as the "urban heat island effect."⁴⁴ The chart above explains the likelihood of heat disorders that may result from high heat.⁴⁵

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 average and 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 those who are stranded or live in a poorly insulated home or without heat.⁴⁶ The National Weather Service Chart (to the right) shows windchill due to wind and temperature.⁴⁷



⁴⁴ NOAA, Index/Heat Disorders; <http://www.srh.noaa.gov/ssd/html/heatwv.htm>

⁴⁵ NOAA; <http://www.nws.noaa.gov/os/heat/index.shtml>

⁴⁶ CDC; <http://www.bt.cdc.gov/disasters/winter/guide.asp> f

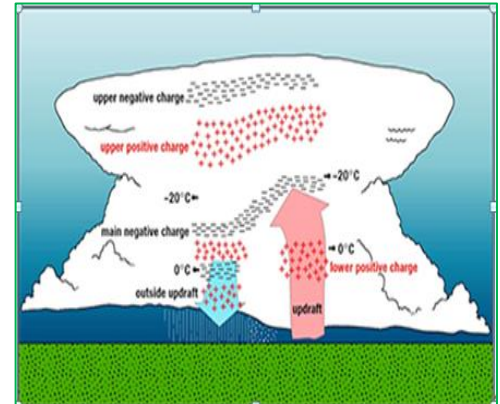
⁴⁷ National Weather Service; <http://www.nws.noaa.gov/om/windchill/>

***LIGHTNING & HAIL**

Lightning

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.”⁴⁸

Thunder, a result of lightning, is created when the “lightning channel heats the air to around 18,000 degrees Fahrenheit...”⁴⁹ thus causing the rapid expansion of the air and the sounds we hear as thunder. Although thunder heard during a storm cannot hurt you, the lightning associated with the thunder can strike people and strike homes, out-buildings, grass, and trees, sparking disaster. In addition, wildfires and structure loss are at 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; they may even occur during a winter snowstorm. Trees, tall buildings, and mountains are often lightning targets because their tops are closer to the cloud; however, lightning is unpredictable and does not always strike the tallest thing in the area.

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

In general, lightning decreases across the US mainland toward the northwest. Over the entire year, the highest frequency of cloud-to-ground lightning is in Florida between Tampa and Orlando. This phenomenon is due to the presence, on many days during the year, of significant moisture content in the atmosphere at low levels (below 5,000 feet) and high surface temperatures that produce strong sea breezes along the Florida coasts. The western mountains of the US also produce strong upward motions and contribute to frequent cloud-to-ground lightning. There are also high frequencies along the Gulf of Mexico, the Atlantic coast, and the southeast United States. US regions along the Pacific west coast have the least cloud-to-ground lightning.”⁵⁰

⁴⁸ NOAA National Severe Storms Laboratory, <https://www.nssl.noaa.gov/education/svrwx101/lightning>

⁴⁹ Ibid

⁵⁰ Ibid

Hailstorm

Lightning Activity Level (LAL) Grid

The lightning activity level is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

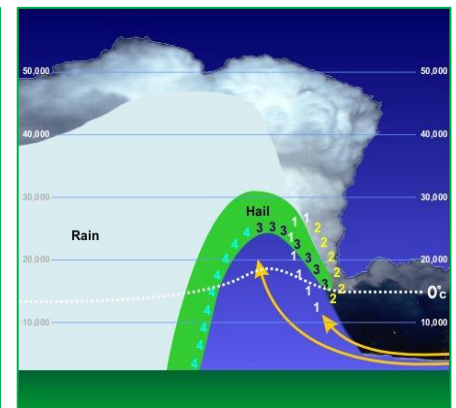
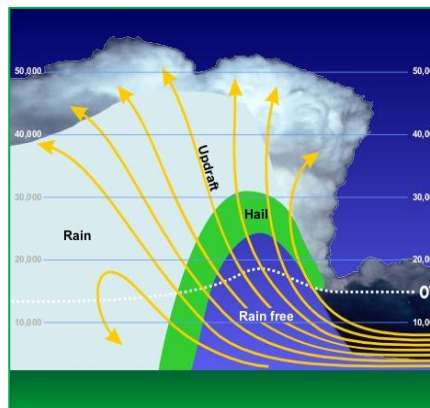
LAL	Cloud & Storm Development	Lightning Strikes 15 Minutes
1	No thunderstorms	-
2	Cumulus clouds are common, but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered, and more than three must occur within the observation area. Moderate rain is common, and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense.	>25
6	Similar to LAL 3, except thunderstorms are dry.	

<http://www.prh.noaa.gov/hnl/pages/LAL.php>

Hailstones are balls of ice that grow as they are 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 ice balls 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.”⁵¹

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

The charts to the right show how hail is formed. How hailstones grow is 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.⁵²



⁵¹ NOAA National Severe Storms Laboratory; <https://www.nssl.noaa.gov/education/svrwx101/hail/>

⁵² <http://oceanservice.noaa.gov/education/yos/resource/JetStream/tstorms/hail.htm#hail>

***WILDFIRES**

As stated by the National Wildfire Coordinating Group (NWCG), wildfires are designated in seven categories as seen in the top chart to the right:⁵³ For statistical analysis, the US Forest Service recognizes the cause of fires according to the bottom chart to the right:⁵⁴

According to the International Wildland-Urban Interface Code (IWUIC), the definition 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 (WUI) area as *“that geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels.”*⁵⁵

There are two major potential losses with a wildfire: the forest itself and the threat to the built-up human environment. 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.

TROPICAL & POST-TROPICAL CYCLONES*Cyclones (Hurricanes)**

A hurricane is a tropical cyclone where winds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center. The storm's eye 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” (on the following page⁵⁶) 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 and require preventative measures. In the western North Pacific, the term “super typhoon” is used for tropical cyclones with sustained winds exceeding 150 mph.”⁵⁷

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

Post-Tropical Cyclones

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 24 hours was reported in Alvin, TX, due to Tropical Storm Claudette.⁵⁸

Class	Aces Burned
Class A	0 to .25 acres
Class B	.26 to 9 acres
Class C	10 to 99 acres
Class D	100 to 299 acres
Class E	300 to 999 acres
Class F	1,000 to 4,999 acres
Class G	5,000 acres or more
Code	Statistical Cause
1	Lightning
2	Equipment Use
3	Smoking
4	Campfire
5	Debris Burning
6	Railroad
7	Arson
8	Children
9	Miscellaneous

⁵³ <http://www.nwcg.gov/pms/pubs/glossary/s.htm>

⁵⁴ https://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?5109.14

⁵⁵ International Wildland-Urban Interface Code, 2012, International Code Council, Inc.

⁵⁶ National Hurricane Center; <http://www.nhc.noaa.gov/aboutsshws.php>

⁵⁷ National Hurricane Center, NOAA; <http://www.nhc.noaa.gov/aboutsshws.php>

⁵⁸ http://www.wpc.ncep.noaa.gov/research/mcs_web_test_test_files/Page1637.htm

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 the roof, shingles, and 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 significant roof and siding damage. In addition, 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 significant 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)	157 mph or higher 137 kt. or higher 252 km/h or higher	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.

*EARTHQUAKES

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. More significant 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 use of two scales widely determines the magnitude and intensity of an earthquake, 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 one as the lowest, with each successive unit being about ten times stronger and more severe than the previous one.⁵⁹

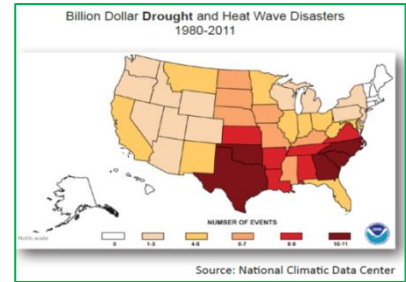
Four earthquakes occurred in New Hampshire between 1924-1989, having a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia and one near the Quebec border. It is well documented that fault lines are running throughout New Hampshire, but high magnitude earthquakes have not been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

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

⁵⁹ Modified Mercalli Scale/Richter Scale Chart; MO DNR, http://www.dnr.mo.gov/geology/geosrv/geores/richt_mercalli_relation.htm

***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 streamflow.



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 streamflow. Low stream flow also correlates with low groundwater levels because groundwater discharge to streams and rivers maintains streamflow during extended dry periods. Low streamflow and low groundwater levels commonly cause diminished water supply.

The US Drought Monitor provides an intensity scale as shown below to indicate the “Category” of drought at any given time. During the peak months of the 2016 drought in New Hampshire, the southern part of the state was in Category D3 or Extreme Drought.

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	<ul style="list-style-type: none"> Going into drought: <ul style="list-style-type: none"> short-term dryness slowing planting, growth of crops or pastures Coming out of drought: <ul style="list-style-type: none"> some lingering water deficits pastures or crops not fully recovered 	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested 	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed 	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/pasture losses Widespread water shortages or restrictions 	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies 	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

<https://droughtmonitor.unl.edu/AboutUSDM/AbouttheData/DroughtClassification.aspx>

***LANDSLIDE & EROSION**

Erosion is the wearing away of lands, such as riverbank loss, 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 results from 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, erosion can destroy buildings and infrastructure.⁶⁰

While no universally accepted standard or scientific scale has been developed for measuring the severity of all landslides, severity can be measured several other ways:

- Steepness/grade of the Slope (measured as a percent)
- Geographical Area
 - Measured in square feet, square yards, etc.
 - More accurately measured using LIDAR/GIS systems
- Earthquake, either causing the event or caused by the event (measured using the Moment Magnitude Intensity or Mercalli Scale)

There are also multiple types of landslides:

- Falls: A mass detaches from a steep slope or cliff and descends by free-fall, bounding, or rolling
- Topples: A mass tilts or rotates forward as a unit
- Slides: A mass displaces on one or more recognizable surfaces, which may be curved or planar
- Flows: A mass moves downslope with a fluid motion. A significant amount of water may or may not be part of the mass

Like flooding, landslides are unique in how they affect different geographic, topographic, and geologic areas. Therefore, consideration of many measurements is required to determine the severity of the landslide event.⁶¹

***INFECTIOUS DISEASES**

Bacterial & Viral Infections

Many organisms live inside our bodies and on our skin. Although these organisms are generally harmless and sometimes even helpful, they can cause illnesses. Infectious diseases can be transmitted from one person to another, by bites from animals or insects (zoonotic), from the environment, or by consuming food or water that has been contaminated. In addition, infectious diseases may be caused by bacteria, viruses, fungi, and parasites.⁶²

Some of the more common infectious diseases include Lyme disease, HIV/AIDS, Tuberculosis, Rabies, West Nile Virus, Eastern Equine Encephalitis (EEE), Ebola, Avian Flu, Enterovirus D-68, Influenza, Hepatitis A, Zika Virus, Meningitis, Legionella, Sexually Transmitted Diseases (STD), Hepatitis C, Salmonella, SARS and Staph.⁶³

⁶⁰ Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013

⁶¹ State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 & <https://oas.org/dsd/publications/Unit/oea66e/ch10.htm>

⁶² <https://www.mayoclinic.org/diseases-conditions/infectious-diseases/symptoms-causes/syc-20351173>

⁶³ <https://www.dhhs.nh.gov/dphs/cdcs/index.htm>

“Throughout history, millions of people have died of diseases such as bubonic plague or the Black Death, which is caused by Yersinia pestis bacteria, and smallpox, which is caused by the variola virus. In recent times, viral infections have been responsible for two major pandemics: the 1918-1919 “Spanish Flu” epidemic that killed 20-40 million people, and the ongoing HIV/AIDS epidemic that killed an estimated 1.5 million people worldwide in 2013 alone.

Bacterial and viral infections can cause similar symptoms such as coughing and sneezing, fever, inflammation, vomiting, diarrhea, fatigue, and cramping – all of which are ways the immune system tries to rid the body of infectious organisms. But bacterial and viral infections are dissimilar in many other important respects, most of them due to the organisms’ structural differences and the way they respond to medications.”⁶⁴

In early 2020, a novel coronavirus emerged in China, spreading worldwide to become the worst pandemic since the 1918 Spanish Flu. Known as Covid-19, this novel coronavirus had infected 282,617,755 people and caused the deaths of 5,413,303 individuals worldwide as of December 28, 2021. Confirmed cases in the US as of this date were reported to be 53,157,034, with 820,545 reported deaths.⁶⁵ Most US residents were advised to “stay-at-home” by State Governors; businesses closed to flatten the rising curve of confirmed cases through mitigation. As of June 2021, mitigation, testing, and vaccination efforts appeared to be working in much of the United States. However, the Delta and Omicron variants appeared in the US in December 2021, causing critical concerns about the possibility of overwhelming the country’s hospital systems.

The pandemic is an evolving worldwide crisis, affecting millions of workers in the United States and presenting massive economic results. Although most people confirmed with Covid-19 eventually recover, the virus has impacted the elderly and compromised individuals, particularly those in confined living quarters such as nursing homes and prisons.

The extent of infectious diseases is generally described by the level and occurrence of a particular disease as follows⁶⁶:

Endemic.....	Disease with a constant presence or usual prevalence in a population within a geographic area
Sporadic.....	Disease that occurs infrequently and irregularly
Hyperendemic.....	Disease that is persistent and has high levels of occurrence
Epidemic	Disease that shows an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area
Outbreak	Disease that has the same definition as an epidemic but is often used for a more limited geographic area
Cluster.....	Refers to an aggregation of cases grouped in place and time that are suspected to be greater than the number expected, even though the expected number may not be known.
Pandemic.....	An epidemic that has spread over several countries or continents, usually affecting a large number of people

Opioid Crisis

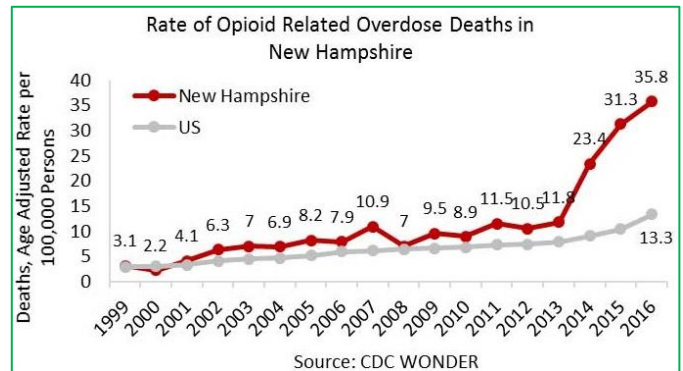
⁶⁴ <https://www.webmd.com/a-to-z-guides/bacterial-and-viral-infections#1>

⁶⁵ <https://coronavirus.jhu.edu/map.html>

⁶⁶ <https://www.cdc.gov/ophs/csels/dsepd/ss1978/lesson1/section11.html>

A revised report by the National Institute of Drug Abuse states, “Every day, more than 130 people in the United States die after overdosing on opioids. The misuse of and addiction to opioids—including prescription pain relievers, heroin, and synthetic opioids such as fentanyl - is a serious national crisis that affects public health as well as social and economic welfare. The Centers for Disease Control and Prevention estimates that the total “economic burden” of prescription opioid misuse alone in the United States is \$78.5 billion a year, including the costs of healthcare, lost productivity, addiction treatment, and criminal justice involvement.”

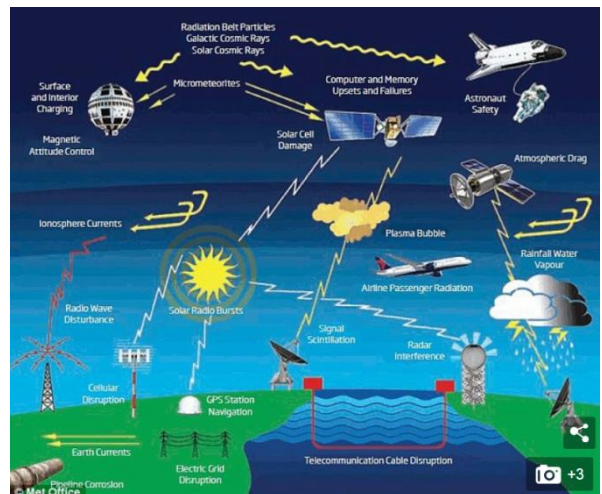
According to the National Institute on Drug Abuse, “New Hampshire has the second highest rate of opioid-related overdose deaths – a rate of 35.8 deaths per 100,000 persons – nearly 3 times higher than the national rate of 13.2 deaths per 100,000. From 2013 through 2016, opioid-related deaths in New Hampshire tripled. This increase was mainly driven by the number of deaths related to synthetic opioids (predominately fentanyl), which increased more than tenfold, from 30 to 363 deaths, during this time.”⁶⁷ The chart to the right shows the increase in opioid-related overdose deaths in New Hampshire compared to the US overall.⁶⁸



SOLAR STORM & SPACE WEATHER

When sudden amounts of stored magnetic energy and ions are discharged from the Sun’s surface, solar flares, high-speed solar wind streams, solar energetic particles, and coronal mass ejections (CMEs) are possible. This magnetic energy sometimes finds its way to Earth by following the Sun’s magnetic field. Then, upon collision with the Earth’s magnetic field, these charged particles enter the Earth’s upper atmosphere, causing Auroras.

Charged magnetic particles can produce their own magnetic field, which can disrupt navigation and communication systems and GPS satellites. In addition, they can potentially produce Geomagnetic Induced Currents (GICs), affecting the power grid and pipelines. In addition, an electromagnetic surge from a solar storm can produce an Electromagnetic Pulse (EMP). An EMP could cause significant damage to infrastructures such as nuclear power plants, banking systems, the electrical grid, sewage treatment facilities, cell phones, landlines, and even vehicles. The image above shows the potential impacts of solar storms and space weather.⁶⁹



⁶⁷ <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-summaries-by-state/new-hampshire-opioid-summary>

⁶⁸ Ibid

⁶⁹ <https://www.dailymail.co.uk/sciencetech/article-3764842/A-solar-storm-destroy-planet-unless-create-massive-magnetic-shield-protect-Earth-warns-expert.html>

Solar Storm & Space Weather Extent⁷⁰

Geomagnetic Storms				
Scale	Description	Effect	Physical Measure	Average Frequency (1 cycle = 11 years)
G 5	Extreme	Power systems: Widespread voltage control problems and protective system problems can occur; some grid systems may experience complete collapse or blackouts. Transformers may experience damage. Spacecraft operations: May experience extensive surface charging, problems with orientation, uplink/downlink, and tracking satellites. Other systems: Pipeline currents can reach hundreds of amps, HF (high frequency) radio propagation may be impossible in many areas for one to two days, satellite navigation may be degraded for days, low-frequency radio navigation can be out for hours, and aurora has been seen as low as Florida and southern Texas (typically 40° geomagnetic lat.).	Kp. = 9	4 per cycle (4 days per cycle)
G 4	Severe	Power systems: Possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. Spacecraft operations: May experience surface charging and tracking problems; corrections may be needed for orientation problems. Other systems: Induced pipeline currents affect preventive measures, HF radio propagation sporadic, satellite navigation degraded for hours, low-frequency radio navigation disrupted, and aurora has been seen as low as Alabama and northern California (typically 45° geomagnetic lat.).	Kp. = 8, including a 9-	100 per cycle (60 days per cycle)
G 3	Strong	Power systems: Voltage corrections may be required; false alarms triggered on some protection devices. Spacecraft operations: Surface charging may occur on satellite components, drag may increase on low-Earth-orbit satellites, and corrections may be needed for orientation problems. Other systems: Intermittent satellite navigation and low-frequency radio navigation problems may occur, HF radio may be intermittent, and aurora has been seen as low as Illinois and Oregon (typically 50° geomagnetic lat.).	Kp. = 7	200 per cycle (130 days per cycle)
G 2	Moderate	Power systems: High-latitude power systems may experience voltage alarms; long-duration storms may cause transformer damage. Spacecraft operations: Corrective actions to orientation may be required by ground control; possible changes in drag affect orbit predictions. Other systems: HF radio propagation can fade at higher latitudes, and aurora has been seen as low as New York and Idaho (typically 55° geomagnetic lat.).	Kp. = 6	600 per cycle (360 days per cycle)
G 1	Minor	Power systems: Weak power grid fluctuations can occur. Spacecraft operations: Minor impact on satellite operations possible. Other systems: Migratory animals are affected at this and higher levels; aurora is commonly visible at high latitudes (northern Michigan and Maine).	Kp. = 5	1700 per cycle (900 days per cycle)

Solar Radiation Storms				
Scale	Description	Effect	Physical Measure (Flux level of ≥ 10 MeV particles)	Average Frequency (1 cycle = 11 years)
S 5	Extreme	Biological: Unavoidable high radiation hazard to astronauts on EVA (extra-vehicular activity); passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. Satellite operations: Satellites may be rendered useless, memory impacts can cause loss of control, may cause serious noise in image data, star-trackers may be unable to locate sources, permanent damage to solar panels is possible. Other systems: Complete blackout of HF (high frequency) communications possible through the polar regions and position errors make navigation operations extremely difficult.	10^5	Fewer than 1 per cycle
S 4	Severe	Biological: Unavoidable radiation hazard to astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. Satellite operations: May experience memory device problems and noise on imaging systems; star-tracker problems may cause orientation problems, and solar panel efficiency can be degraded. Other systems: Blackout of HF radio communications through the polar regions and increased navigation errors over several days are likely.	10^4	3 per cycle

⁷⁰ Extent charts taken from <https://www.weather.gov/akq/SpaceWeather>

Solar Radiation Storms				
S 3	Strong	Biological: Radiation hazard avoidance is recommended for astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. Satellite operations: Single-event upsets, noise in imaging systems, and slight reduction of efficiency in solar panels are likely. Other systems: Degraded HF radio propagation through the polar regions and navigation position errors likely.	10^3	10 per cycle
S 2	Moderate	Biological: Passengers and crew in high-flying aircraft at high latitudes may be exposed to elevated radiation risk. Satellite operations: Infrequent single-event upsets possible. Other systems: minor effects on HF propagation through the polar regions and navigation at polar cap locations possibly affected.	10^2	25 per cycle
S 1	Minor	Biological: None. Satellite operations: None. Other systems: Minor impacts on HF radio in the polar regions.	10	50 per cycle

Radio Blackout				
Scale	Description	Effect	Physical Measure	Average Frequency (1 cycle = 11 years)
R 5	Extreme	HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and on-route aviators in this sector. Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	$X20 (2 \times 10^{-3})$	Less than 1 per cycle
R 4	Severe	HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	$X10 (10^{-3})$	8 per cycle (8 days per cycle)
R 3	Strong	HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. Navigation: Low-frequency navigation signals degraded for about an hour.	$X1 (10^{-4})$	175 per cycle (140 days per cycle)
R 2	Moderate	HF Radio: Limited blackout of HF radio communication on the sunlit side, loss of radio contact for tens of minutes. Navigation: Degradation of low-frequency navigation signals for tens of minutes.	$M5 (5 \times 10^{-5})$	350 per cycle (300 days per cycle)
R 1	Minor	HF Radio: Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact. Navigation: Low-frequency navigation signals degraded for brief intervals.	$M1 (10^{-6})$	2000 per cycle (950 days per cycle)

AVALANCHES

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 specific 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.”⁷¹



“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 fail. Skiers and recreationalists usually trigger smaller, but often more deadly avalanches.”

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.				

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.”⁷²

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 most extensive 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. In addition, some of these conditions, such as temperature and snowpack, can change on a daily or hourly basis.”⁷³

⁷¹ Copyright Richard Armstrong, NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>

⁷² NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>; image credit: Betsy Armstrong

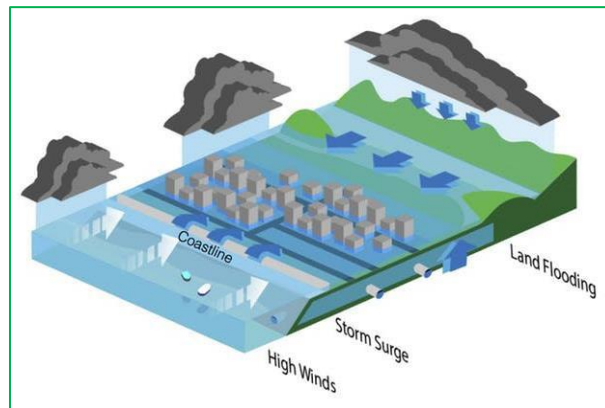
⁷³ Copyright Richard Armstrong, NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>

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 above shows avalanche danger as determined by likelihood, size & distribution.⁷⁴

COASTAL FLOODING

Coastal areas are particularly susceptible to hazards such as flooding, erosion, storm surge, and sea-level rise due to tropical and post-tropical cyclones, heavy rain events and gale-force winds, and other natural phenomena. The flooding that results is “determined by a combination of several factors such as storm intensity, forward speed, storm area size, coastline characteristics, angle of approach to the coast, tide height.”⁷⁵

The severity of the flooding can vary depending on “both the speed of onset (how quickly the floodwaters rise) and the flood duration. Nor’easters can impact the region for several days and produce storm surge with or without the addition of inland runoff from heavy precipitation.”⁷⁶ As shown in the image below, storm surge and inland flooding can affect the severity of flooding along the shore.⁷⁷



⁷⁴ http://www.avalanche.org/danger_card.php

⁷⁵ NH Multi-hazard Mitigation Plan-2018, page 55

⁷⁶ Ibid

⁷⁷ Ibid, page 53, “Understanding compound flooding from land and ocean sources”, Theodore Scontras, University of Maine)

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APPENDIX D: NH MAJOR DISASTER & EMERGENCY DECLARATIONS

Major Disaster (DR) & Emergency Declarations (EM)

This list includes one Fire Management Assistance Declaration (FM)

Declarations are arranged chronologically; the most recent disaster is listed first

Number	Hazard	Date of Event	Counties	Description
DR-4624	Inland Flooding	July 29-July 30, 2021	Cheshire & Sullivan	Major Disaster Declaration, DR-4624: The Federal Emergency Management Agency announced a major disaster declaration and notification of individual and public assistance on October 4, 2021, for two NH Counties.
DR-4622	Inland Flooding	July 17-19, 2021	Cheshire	Major Disaster Declaration, DR-4622: The Federal Emergency Management Agency announced a major disaster declaration during a period of severe storms and flooding from July 17-19, 2021, in one New Hampshire County.
DR-4516	Infectious Disease	January 20, 2020 ongoing	All Ten NH Counties	Major Disaster Declaration, DR-4516: The Federal Emergency Management Agency ("FEMA") within the US Department of Homeland Security is giving public notice of its intent to assist the State of New Hampshire, local and tribal governments, and certain private nonprofit organizations under the major disaster declaration issued by the President on April 3, 2020, as a result of the Coronavirus Disease 2019 (Covid-19).
EM-3445	Infectious Disease	January 20, 2020 ongoing	All Ten NH Counties	Emergency Declaration EM-3445: A ten-county declaration to provide individual assistance and public assistance as a result of the impact of Covid-19
DR-4457	Severe Storm & Flooding	July 11-12, 2019	Grafton	Major Disaster Declaration, DR-4457: The Federal Emergency Management Agency announced a major disaster declaration for a period of severe storms and flooding from July 11-12, 2019, in one New Hampshire County.
DR-4371	Severe Winter Storm & Snowstorm	March 13-14, 2018	Carroll, Strafford & Rockingham	Major Disaster Declaration, DR 4371: The Federal Emergency Management Agency announced a major disaster declaration on June 8, 2018, for a period of a severe winter storm from March 13-14, 2018.
DR-4370	Severe Storm & Flooding	March 2-8, 2018	Rockingham	Major Disaster Declaration, DR 4370: The Federal Emergency Management Agency announced a major disaster declaration on June 8, 2018, for a period of severe storms and flooding from March 2-8, 2018.
DR-4355	Severe Storms, Flooding	October 29-November 1, 2017	Sullivan, Grafton, Coos, Carroll, Belknap & Merrimack	Major Disaster Declaration, DR-4355: The Federal Emergency Management Agency (FEMA) announced that federal disaster assistance was available to supplement state and local recovery efforts in areas affected by severe storms and flooding from October 29-November 1, 2017, in five New Hampshire Counties.
DR-4329	Severe Storms, Flooding	July 1-2, 2017	Grafton & Coos	Major Disaster Declaration DR-4329: The Federal Emergency Management Agency (FEMA) announced that federal disaster assistance is available to the state of New Hampshire to supplement state and local recovery efforts in the areas affected by severe storms and flooding from July 1, 2017, to July 2, 2017, in Grafton County
DR-4316	Severe Winter Storm and Snowstorm	March 14-15, 2017	Belknap & Carroll	Major Disaster Declaration DR-4316: Severe winter storm and snowstorm in Belknap & Carroll Counties; disaster aid to supplement state and local recovery efforts.

Number	Hazard	Date of Event	Counties	Description
FM-5123	Forest Fire	April 21-23, 2016	Cheshire	Fire Management Assistance Declaration, FM-5123: Stoddard, NH
DR-4209	Severe Winter Storm and Snowstorm	January 26-28, 2015	Hillsborough, Rockingham & Stafford	Major Disaster Declaration DR-4209: Severe winter storm and snowstorm in Hillsborough, Rockingham, and Strafford Counties; disaster aid to supplement state and local recovery efforts.
DR-4139	Severe Storms, Flooding	July 9-10, 2013	Cheshire, Sullivan & Grafton	Major Disaster Declaration DR-4139: Severe storms, flooding, and landslides during 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	Major Disaster Declaration DR-4105: Nemo; heavy snow in February 2013.
DR-4095	Hurricane Sandy	October 26-November 8, 2012	Belknap, Carroll, Coos, Grafton, Rockingham & Sullivan	Major Disaster Declaration DR-4095: The declaration covers damage to property from the storm that spawned heavy rains, high winds, high tides, and flooding throughout October 26-November 8, 2012.
EM-3360	Hurricane Sandy	October 26-31, 2012	All Ten NH Counties	Emergency Declaration EM-3360: Hurricane Sandy came ashore in NJ and brought high winds, power outages, and heavy rain to NH. It was declared in all ten counties in New Hampshire.
DR-4065	Severe Storm & Flooding	May 29-31, 2012	Cheshire	Major Disaster Declaration DR-4065: Severe Storm and Flood Event May 29-31, 2012 in Cheshire County.
DR-4049	Severe Storm & Snowstorm	October 29-30, 2011	Hillsborough & Rockingham	Major Disaster Declaration DR-4049: Severe Storm and Snowstorm Event October 29-30, 2011 in Hillsborough and Rockingham Counties.
EM-3344	Severe Snowstorm	October 29-30, 2011	All Ten NH Counties	Emergency Declaration EM-3344: Severe storm during October 29-30, 2011; all ten counties in New Hampshire. (Snowtober)
DR-4026	Tropical Storm Irene	August 26-September 6, 2011	Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	Major Disaster Declaration DR-4026: Tropical Storm Irene Aug 26th- Sept 6, 2011, in Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan Counties.
EM-3333	Tropical Storm Irene	August 26-September 6, 2011	All Ten NH Counties	Emergency Declaration EM-3333: Emergency Declaration for Tropical Storm Irene in all ten counties.
DR-4006	Severe Storm & Flooding	May 26-30, 2011	Coos & Grafton Counties	Major Disaster Declaration DR-4006: May Flooding Event, May 26th-30th 2011 in Coos & Grafton County. (Memorial Day Weekend Storm)
DR-1913	Severe Storms & Flooding	March 14-31, 2010	Hillsborough & Rockingham	Major 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	Major 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	Major Disaster Declaration DR-1812: Damaging ice storms to the entire state, including all ten NH counties; fallen trees and large-scale power outages; five months after December's ice storm battered the region, nearly \$15 million in federal aid had been obligated.
EM-3297	Severe Winter Storm	December 11, 2008	All Ten NH Counties	Emergency Declaration EM-3297: Severe winter storm beginning on December 11, 2008.
DR-1799	Severe Storms & Flooding	September 6-7, 2008	Hillsborough	Major Disaster Declaration: DR-1799: Severe storms and flooding beginning on September 6, 2008.

Number	Hazard	Date of Event	Counties	Description
DR-1787	Severe Storms & Flooding	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	Major Disaster 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	Major Disaster Declaration DR-1782: Tornado damage to several NH counties.
DR-1695	Nor'easter, Severe Storms & Flooding	April 15-23, 2007	All Ten NH Counties	Major Disaster Declaration DR-1695: Flood damages; FEMA & SBA obligated more than \$27.9 million in disaster aid following the April nor'easter. (Tax Day Storm)
DR-1643	Severe Storms & Flooding	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	Major 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	Major 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 2005.
EM-3258	Hurricane Katrina Evacuation	August 29-October 1, 2005	All Ten NH Counties	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 made federal funding available to the state's ten counties.
EM-3211	Snow	March 11-12, 2005	Carroll, Cheshire, Hillsborough, Rockingham & Sullivan	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	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 is \$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	Snow	January, February, March 2005	Belknap, Carroll, Cheshire, Grafton, Hillsborough, Rockingham, Merrimack, Strafford & Sullivan	Emergency Declaration EM 3208-002: The Federal Emergency Management Agency (FEMA) has obligated more than \$6.5 million to reimburse state and local governments in New Hampshire for costs incurred in three snowstorms that hit the state earlier this 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)
EM-3207	Snow	January 22-23, 2005	Belknap, Carroll, Cheshire, Grafton, Hillsborough, Rockingham, Merrimack, Strafford & Sullivan	Emergency Declaration EM-3207: More than \$3.5 million has been approved to help pay for costs of the heavy snow and high winds; Total aid for the January storm is \$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)

Number	Hazard	Date of Event	Counties	Description
EM-3193	Snow	December 6-7, 2003	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan	Emergency Declaration EM-3193: The declaration covers jurisdictions with record and near-record snowfall that occurred throughout December 6-7, 2003
DR-1489	Severe Storms & Flooding	July 21-August 18, 2003	Cheshire & Sullivan	Major Disaster Declaration DR-1489: Floods stemming from persistent rainfall and severe storms caused damage to public property from July 21 through August 18, 2003.
EM-3177	Snowstorm	February 17-18, 2003	Cheshire, Hillsborough, Merrimack, Rockingham & Strafford	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, Rockingham & Strafford	Emergency Declaration EM-3166: Declaration covers jurisdictions with record and near-record snowfall from the late winter storm that occurred in March 2001
DR-1305	Tropical Storm Floyd	September 16-18, 1999	Belknap, Cheshire & Grafton	Major Disaster Declaration DR-1305: The declaration covers damage to public property from the storm that spawned heavy rains, high winds, and flooding throughout September 16-18.
DR-1231	Severe Storms & Flooding	June 12-July 2, 1998	Belknap, Carroll, Grafton, Hillsborough, Merrimack & Rockingham	Major Disaster Declaration DR-1231:
DR-1199	Ice Storm	January 7-25, 1998	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Strafford & Sullivan	Major Disaster Declaration DR-1199:
DR-1144	Severe Storms/Flooding	October 20-23, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	Major Disaster Declaration DR-1144:
DR-1077	Storms/Floods	October 20-November 15, 1995	Carroll, Cheshire, Coos, Grafton, Merrimack & Sullivan	Major Disaster Declaration DR-1077:
EM-3101	High Winds & Record Snowfall	March 13-17, 1994	All Ten NH Counties	Emergency Declaration EM-3101:
DR-923	Severe Coastal Storm	October 30-31, 1991	Rockingham	Major Disaster Declaration DR-923:
DR-917	Hurricane Bob, Severe Storm	August 18-20, 1991	Carroll, Hillsborough, Rockingham & Strafford	Major Disaster Declaration DR-917:

Number	Hazard	Date of Event	Counties	Description
DR-876	Flooding, Severe Storm	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Sullivan	Major Disaster Declaration DR-876:
DR-789	Severe Storms & Flooding	March 30-April 11, 1987	Carroll, Cheshire, Grafton, Hillsborough, Merrimack Rockingham, Strafford & Sullivan	Major Disaster Declaration DR-789
DR-771	Severe Storms & Flooding	July 29-August 10, 1986	Cheshire, Hillsborough & Sullivan	Major Disaster Declaration DR-771:
EM-3073	Flooding	March 15, 1979	Coos	Emergency Declaration EM-3073:
DR-549	High Winds, Tidal Surge, Coastal Flooding & Snow	February 16, 1978	All Ten NH Counties	Major Disaster Declaration DR-549: Blizzard of 1978
DR-411	Heavy Rains, Flooding	January 21, 1974	Belknap, Carroll, Cheshire & Grafton	Major Disaster Declaration DR-411:
DR-399	Severe Storms & Flooding	July 11, 1973	All Ten NH Counties	Major Disaster Declaration DR-399:
DR-327	Coastal Storms	March 18, 1972	Rockingham	Major Disaster Declaration DR-327:
DR-11	Forest Fire	July 2, 1953	Carroll	Major Disaster Declaration DR-11:

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: HAZARD MITIGATION PLANNING – LIST OF ACRONYMS

AAR	After Action Report	HSEM	Homeland Security Emergency Management
ACS	Acute Care Site	HSPD	Homeland Security Presidential Directive
ARC	American Red Cross	IAP	Incident Action Plan
ARES	Amateur Radio Emergency Service	IC	Incident Commander
BFE	Base Flood Elevation	ICC	Incident Command Center
BOCA	Building Officials and Code Administrators	ICS	Incident Command System
CBRNE	Chemical, Biological, Radiological,	JIC	Joint Information Center
CDC	Centers for Disease Control and Prevention	LEOP	Local Emergency Operations Plan
CDP	Center for Domestic Preparedness	MAPS	Mapping and Planning Solutions
CERT	Community Emergency Response Team	MCI	Mass Casualty Incident
CFR	Code of Federal Regulations	MEF	Mission Essential Function
CIKR	Critical Infrastructure & Key Resources	MOU	Memorandum of Understanding
CIP	Capital Improvements Program	NAWAS	National Warning System
COG	Continuity of Government	NEF	National Essential Function
COOP	Continuity of Operations	NERF	Non-Emergency Response Facility
CPCC	Continuity Policy Coordination Committee	NFIP	National Flood Insurance Program
CWPP	Community Wildfire Protection Plan	NGVD	National Geodetic Vertical Datum of 1929
DBHRT	Disaster Behavioral Health Response Team	NIMS	National Incident Management System
DEMD	Deputy Emergency Management Director	NOAA	National Oceanic and Atmospheric Association
DES	Department of Environment Services	NRP	National Response Plan
DFO	Disaster Field Office	NSPD	National Security Presidential Directive
DHHS	Department of Health and Human Services	NTAS	National Terrorism Advisory System
DHS	Department of Homeland Security		Nuclear and Explosive
DMCR	Disaster Management Central Resource	NWS	National Weather Service
DNCR	Department of Natural & Cultural Resources	BEA	Bureau of Economic Affairs
DOD	Department of Defense	PA	Public Assistance
DOE	Department of Energy	PDA	Preliminary Damage Assessment
DOJ	Department of Justice	PDD	Presidential Decision Directive
DOT	Department of Transportation	PIO	Public Information Officer
DPW	Department of Public Works	PMEF	Primary Mission Essential Function
DRC	Disaster Recovery Center	POD	Point of Distribution
EAS	Emergency Alert System	PPE	Personal Protective Equipment
EMD	Emergency Management Director	PR	Potential Resources
EMS	Emergency Medical Services	PSA	Public Service Announcement
EO	Executive Order	RERP	Radiological Emergency Response Plan
EOC	Emergency Operations Center	RNAT	Rapid Needs Assessment Team
EPA	U.S. Environmental Protection Agency	SERT	State Emergency Response Team
EPZ	Emergency Planning Zone	SITREP	Situation Report (Also SitRep)
ERF	Emergency Response Facility	SNS	Strategic National Stockpile
ERG	Emergency Relocation Group	SOG	Standard Operating Guidelines
ESF	Emergency Support Functions	SOP	Standard Operating Procedures
FEMA	Federal Emergency Management Agency	SPNHF	Society for the Protection of NH Forests
FIRM	Flood Insurance Rate Map	UC	Unified Command
FPP	Facilities & Populations to Protect	USDA-FS	US Department of Agriculture – Forest Service
GIS	Geographic Information System	USGS	United States Geological Society
HazMat	Hazardous Material(s)	VOAD	Volunteer Organization Active in Disasters
HFRA	Healthy Forest Restoration Act	WMD	Weapon(s) of Mass Destruction
HMGP	Hazard Mitigation Grant Program	WMNF	White Mountain National Forest
HSAS	Homeland Security Advisory System	WUI	Wildland Urban Interface

APPENDIX F: POTENTIAL MITIGATION IDEAS⁷⁸

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

- F1 Incorporate Flood Mitigation in Local Planning
- F2 Form Partnerships to Support Floodplain Management
- F3 Limit or Restrict Development in Floodplain Areas
- F4 Adopt & Enforce Building Codes and Development Standards
- F5 Improve Stormwater Management Planning
- F6 Adopt Policies to Reduce Stormwater Runoff
- F7 Improve Flood Risk Assessment
- F8 Join or Improve Compliance with NFIP
- F9 Manage the Floodplain beyond Minimum Requirements
- F10 Participate in the CRS
- F11 Establish Local Funding Mechanism for Flood Mitigation
- F12 Remove Existing Structures from Flood Hazard Areas
- F13 Improve Stormwater Drainage System Capacity
- F14 Conduct Regular Maintenance for Drainage Systems & Flood Control Structures
- F15 Elevate or Retrofit Structures & Utilities
- F16 Flood proof Residential & Non-Residential Structures
- F17 Protect Infrastructure
- F18 Protect Critical Facilities
- F19 Construct Flood Control Measures
- F20 Protect & Restore Natural Flood Mitigation Features
- F21 Preserve Floodplains as Open Space
- F22 Increase Awareness of Flood Risk & Safety
- F23 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

⁷⁸ 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

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Mascoma Lake

Photo Credit: Rob Taylor, Land Use & Community Development Administrator

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