

Gorham, NH

Hazard Mitigation Plan Update 2024



This Plan integrates the following:

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

**March 27, 2024
Final for Formal Approval**

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

**By
The Gorham 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: Engine 3 on Mount Washington Auto Road
Photo Credit: Phil Cloutier, Fire Chief & EMD

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

- NH Homeland Security & Emergency Management (HSEM)
- Federal Emergency Management Agency (FEMA)
- NH Office of Strategic Initiatives (OSI)
- Mapping and Planning Solutions (MAPS)
- White Mountain National Forest (WMNF)
- NH Forests & Lands (DNCR)

**This plan is an update to the most recent Gorham Hazard Mitigation Plan, approved on May 17, 2016.
This plan was funded under the Pre-disaster Mitigation Grant Program (PDM19)**

Approval Notification Dates for 2024 Update

Approved Pending Adoption (APA) March 14, 2024
 Jurisdiction Adoption: March 26, 2024
***Plan Approval Date (FEMA):** , 2024
 Receipt of FEMA Letter , 2024
 Plan Distribution (MAPS): , 2024

**The start of the next five-year clock*

TOWN OF GORHAM HAZARD MITIGATION PLANNING TEAM (HMPT)

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

- Phil Cloutier Gorham Fire Chief & EMD
- Austin Holmes Gorham Public Works Director
- Matt Dustin Gorham Firefighter
- Jeff Stewart Gorham Parks & Recreation Director
- Denise Vallee Gorham Town Manager
- Judy Leblanc Gorham Select Board
- David Backler SAU 20 Superintendent
- Paul Robitaille Gorham Planning Board
- Adam Marsh Gorham Police Chief
- Jeff Tennis Gorham Water & Sewer Superintendent
- Jennifer Gilbert NH OSI
- Lynne Doyle NH HSEM
- Candi Tibbetts NH HSEM
- June Garneau MAPS
- Olin Garneau MAPS

Many thanks for all the hard work and effort you provided. This Plan would not exist without your knowledge and experience. Gorham would also like to thank the Federal Emergency Management Agency and NH Homeland Security & Emergency Management as the primary funding sources for this Plan.

Acronyms or abbreviations associated with the above list:

EMD Emergency Management Director
 SAU School Administrative Unit

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Executive Summary

The Gorham Hazard Mitigation Plan Update 2024 was compiled to assist the Town in reducing and mitigating future losses from natural, technological, or human-caused hazardous events. The Plan was developed by the Gorham 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 2016 Gorham Hazard Mitigation Plan. To produce an accurate and current planning document, the Team used the 2016 plan as a foundation, building upon that plan to provide more timely information.

This project was held virtually due to the Covid-19 pandemic; the Plan's final writing was completed as the pandemic continued. References to Covid-19 and its impact on Gorham are discussed in Chapter 5, Section C, Infectious Diseases.

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

NATURAL HAZARDS

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

TECHNOLOGICAL HAZARDS

- | | |
|-----------------------------|----------------------------------|
| 1) Long-Term Utility Outage | 4) Conflagration |
| 2) Dam Failure | 5) Known & Emerging Contaminants |
| 3) Hazardous Materials | 6) Aging Infrastructure |

HUMAN-CAUSED HAZARDS

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

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 Gorham or were 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).

Communities can sometimes cope with the impact of particular natural hazards. For example, although severe winter weather is often a common hazard in the State, 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 actions that may be implemented.

In summary, finding mitigation action items for every hazard that affects a community can be difficult. With economic constraints, cities and towns are less likely to have the financial ability to complete certain mitigation action items, such as burying power lines. In preparing this Plan, the Gorham HMPT (the Team) has considered a comprehensive list of mitigation action items that could diminish the impact of hazards. The Team 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:

Gorham Hazard Mitigation Plan Update 2024	the Plan or this Plan
Gorham	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 Gorham 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 Gorham 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 Gorham Hazard Mitigation Plan Update 2024 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 Gorham 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 Federal Emergency Management Agency (FEMA) grants. 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 Gorham Hazard Mitigation Plan Update 2024 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 emphasizes 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 Gorham, Coos County, New Hampshire.

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 (HMP) and a Community Wildfire Protection Plan (CWPP), the planning effort included the 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) as well as routine notification of upcoming meetings to other state and federal entities. 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 and NH-DNCR. 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, a community must first prepare a CWPP to take advantage of this opportunity. 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 not only local residents but also officials and residents from surrounding communities. The Town of Gorham 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 Gorham. A press release (see below) was posted at the Town Offices, on the Town's website, and on the Town's calendar (see the following page). The press release was used to notify academia, businesses, and private and non-profit organizations that work with underserved communities and socially vulnerable populations that meetings were taking place, and they were invited to attend.

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)
- Senior Citizen Facilities
- Vulnerable populations
- Academia

OTHER OR SPECIAL INTEREST

- Land Owners
- Home Owners Association(s)
- Forest Management
- Developers & Builders
- Major Businesses

*Mapping and Planning Solutions
PO Box 283
91 Cherry Mountain Place
Twin Mountain, NH 03595*

Press Release

FOR IMMEDIATE RELEASE

Updated: September 24, 2021

Contact: June Garneau
603-991-9664

THE TOWN OF GORHAM COMMENCES HAZARD MITIGATION PLANNING

The Emergency Management Director of the Town of Gorham has met with June Garneau of Mapping and Planning Solutions and other team members from Gorham to work on the required five-year update to the **2016 Gorham Hazard Mitigation Plan**. The Town and Mapping and Planning Solutions are conducting a series of hazard mitigation meetings to develop the plan over the next few months.

Through these public meetings, the planning team will address natural hazards such as flooding, hurricanes, drought, landslides, and wildfires and determine efforts the town can undertake to mitigate the effects of not only natural hazards but also technological and human-caused. The team will also review 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 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. Gorham citizens and any interested stakeholders are invited to participate. The next meeting is scheduled for **Wednesday, October 13, 2021, from 9:00 AM to 11:00 PM** via "Zoom". The public is encouraged to attend all meetings. All interested parties should contact Phil Cloutier, Fire Chief & EMD, by email at pcloutier@gorhamnh.org if they wish to be included in the process; you will be added to the Zoom meeting invitation list. Future meetings are planned for November 10, December 8, 2021, and January 12 and February 9, 2022.

More information on the hazard mitigation planning process is available from June Garneau at jgarneau@mappingandplanning.com.

October 2021

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The Town of Gorham Board of Selectmen will hold a public hearing on Monday, October 25, 2021, at 6:00 pm in the Public...

Hazard Mitigation Plan Update »

TOWN OF GORHAM COMMENCES HAZARD MITIGATION PLAN UPDATE

Town Clerk-Tax Collector's Office Closed Fridays »

TOWN OF GORHAM - NOTICE TO RESIDENTSPlease note that the Town Clerk/Tax Collector's Office will be...

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Hazard Mitigation Plan Update

POSTED ON: SEPTEMBER 27, 2021 - 10:06AM

TOWN OF GORHAM COMMENCES HAZARD MITIGATION PLAN UPDATE

The Town of Gorham is currently working with June Garneau of Mapping & Planning Solutions to update the 2016 Hazard Mitigation Plan and will hold public meetings over the next few months. Please see the attached document for further information.


Attachment	Size
 gorh_hmp_pressrelease_2.pdf	14.42 KB

[Home](#)

Hazard Mitigation Plan Update Meeting


Event Date: Wednesday, October 13, 2021 - 9:00am to 11:00am

Lastly, the Planner sent a monthly calendar (see below) and email inviting stakeholders to participate in planning meetings being held by MAPS. EMDs, Police Chiefs, Fire Chiefs, Rangers, and other state, federal, and private officials were included in this email blast. Gorham's neighbors, Berlin, Randolph, and Shelburne, are part of MAPS' monthly email.



Upcoming Zoom Meetings

(Highlighted by "Counties" as of December 8, 2021)



Day	Date	Time	Town/Location	Plan Type	HSEEM Field Rep	County
Wednesday	12/15/21	1:00 PM	Danville Zoom Meeting	HMP	Heather Dunkerley	Rockingham
Wednesday	1/5/22	9:00 AM	Thornton Zoom Meeting	HMP	Paul Hatch	Grafton
Thursday	1/6/22	9:00 AM	Lincoln Zoom Meeting	HMP	Paul Hatch	Grafton
Monday	1/10/22	7:00 PM	Orange Zoom Meeting	HMP	Paul Hatch	Grafton
Wednesday	1/12/22	9:00 AM	Gorham Zoom Meeting	HMP	Courtney Jordan	Coos
Thursday	1/13/22	10:00 AM	Berlin Zoom Meeting	HMP	Courtney Jordan	Coos

Team composition can be impacted in some communities due to lower population and because many people "wear more than one hat". It is often challenging to attract citizens to participate in town government. In smaller communities, those working in town government generally hold full-time jobs and volunteer 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, a high elderly population, and other economic factors, smaller communities have a dwindling number of young people interested in politics.

Gorham had excellent participation in the development of this Plan. In addition to the Emergency Management Director (EMD)/Fire Chief, the Police Chief, the Public Works Director, the Parks & Recreation Director, and the Water & Sewer Superintendent participated in meetings. The Town Manager, Select Board and Planning Board members, and the Superintendent of SAU 20 also participated in meetings. Comments made by all team members were integrated into the narrative discussion and incorporated into the document. Although the public was informed about the planning meetings, no citizens attended Gorham's meetings.

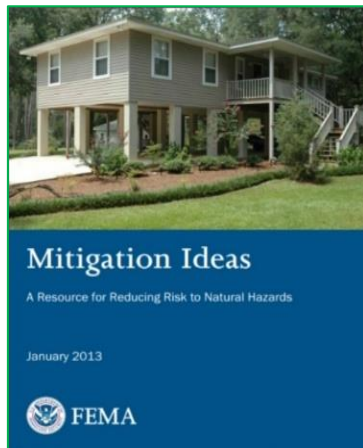
§201.6(b) requires that there be an open public involvement process in the formation of a plan. This process shall provide an opportunity for the public to comment on the Plan during its formation as well as an opportunity for any neighboring communities, businesses, and others to review any existing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

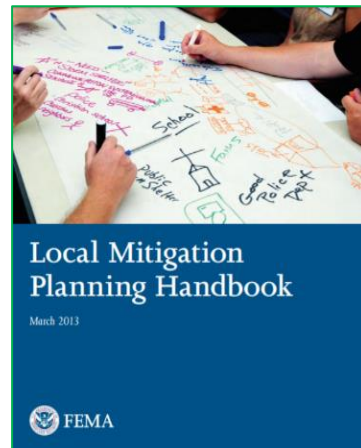
The planning process included a complete review of the Gorham Hazard Mitigation Plan 2016 for updates, development changes, and accomplishments. The Team worked with the Planner to identify pertinent information from the reviewed documents; this information was then added to the appropriate place in 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 Gorham Hazard Mitigation Plan 2016	Compare & Contrast
Gorham Master Plan (2020)	Community Information
Gorham Annual Report (2021).....	Fire Report & Development
Other Hazard Mitigation Plans (Berlin, Randolph, Bethlehem)	Formats & Mitigation Ideas
The Gorham Subdivision Regulations (2021).....	New Development Regulations
The Gorham Site Plan Review Regulations (2021)	Commercial Regulations
The Gorham Zoning Ordinance (2021).....	Zoning Regulations
Floodplain Development Ordinance (Part of Zoning)	Floodplain Regulations
Census 2020 Data	Population Data
The NH DRA Summary of Inventory of Valuation MS-1 2022 for Gorham	Structure Evaluation
The Economic & Labor Market Information Bureau Community Profile	Population Trends
The American Community Survey (ACS 2016-2020)	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)	Flood Losses
Property Tax Valuation (Department of Revenue Administration).....	Property Information

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/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf



https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-planning-handbook_03-2013.pdf

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.

KEY GOALS

- *Minimize loss and disruption of human life, property, the environment, and the economy by implementing appropriate hazard mitigation measures.*
- *Enhance the protection of the civilian population during and after a hazardous event through alerting systems and later through public education.*
- *Promote continued comprehensive hazard mitigation planning at local levels.*
- *Address the challenges posed by climate change.*
- *Strengthen Continuity of Operations (COOP) and Continuity of Government (COG) at the local level.*

NATURAL HAZARD OBJECTIVES

- *Reduce long-term flood risks through assessment, identification, and strategic mitigation.*
- *Minimize illnesses and deaths related to events that threaten human and animal health.*
- *Assist communities with plan development 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.*
- *Collaborate between federal, state, and local agencies and private partners, Non-Governmental Organizations (NGOs), and Volunteer Organizations Active in Disaster (VOADs).*
- *Enhance public education about technological hazards.*
- *Ensure hazardous material (HazMat) teams are adequately equipped and trained.*
- *Build a more resilient voice and data system to lessen the effects of technological hazards.*

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 and vulnerabilities.*
- *Improve the ability to respond to and mitigate Cyber Events.*
- *Foster collaboration between federal, state, and local agencies on training and exercising.*
- *Ensure that state and community assets are prepared for all phases of emergency management, including training, reunification, and exercising.*

H. HAZARD MITIGATION PLANNING PROCESS & METHODOLOGY

The planning process consisted of twelve steps; some were accomplished independently, while others 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 crosstalk regarding natural, technological, and human-caused hazards.



All steps were included but not necessarily in the numerical sequence listed. The steps are 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 historic 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, and mutual aid and brainstorm to identify improvements

Table 6.1 – Current Plans, Policies & Mutual Aid

Step 08: Examine the status of 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

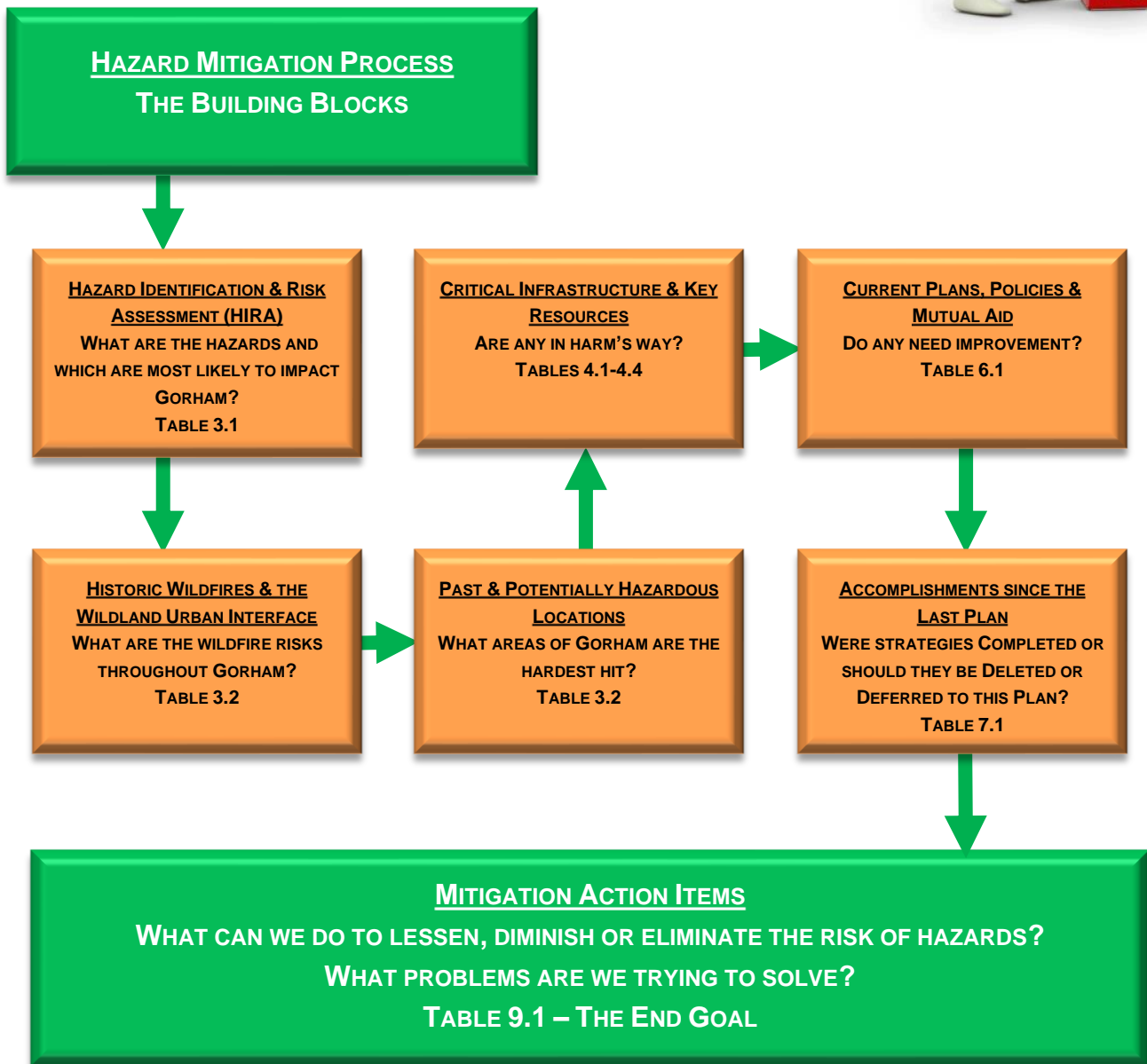
Step 10: Prioritize mitigation action items to determine an action plan

Table 9.1 – The Mitigation Action Plan

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

Step 12: Adopt and monitor the Plan

Using a building block approach, each table led to the next table. The final goal was to develop prioritized 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 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 2016 Gorham Hazard Mitigation Plan. Using the 2016 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. Also, referring to the 2016 plan, strategies from the past were reassessed and improved upon for the future.

The following narrative explains how the 2016 Gorham Hazard Mitigation Plan was used during each step of the planning process to make revisions that resulted in this Plan.

MEETING 1, SEPTEMBER 8, 2021

The first virtual meeting of the Gorham Hazard Mitigation Team was held on September 8, 2021. Meeting attendance included Phil Cloutier (Fire Chief & Emergency Management Director), Austin Holmes (Director of Public Works), Matt Dustin (Fire Captain), Jeff Stewart (Parks & Recreation Director), Denise Vallee (Town Manager), Kayla Henderson (NH Homeland Security & Emergency Management), Olin Garneau (Mapping & 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, the collaboration with other agencies, and the *Goals. The Planner also explained the need to sign in, *track time, 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. The Planner agreed to determine the remaining items through GIS or at a later date. There was some discussion about the seasonal population change in Gorham with summer and winter homes. It was determined that Gorham does 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)*. Then, the Team assessed which hazards could affect the Community using the Town's last HMP and the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018.

Meeting 1 – September 8, 2021

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
- 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

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

5) Homework

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

6) Future Meetings

- a) Wednesday, October 13, 2021 @ 9:00 AM
- b) Wednesday, November 10, 2021 @ 9:00 AM
- c) Wednesday, December 8, 2021 @ 9:00 AM
- d) Wednesday, January 12, 2022 @ 9:00 AM
- e) Wednesday, February 9, 2022 @ 9:00 AM

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

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

Next, 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 to Gorham. 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 hazard or diminish its impact?*

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

With time running out before hazard descriptions were complete, the Team decided to shelve the rest of the description until the next meeting. The Planner thanked the Team for their work and assigned “homework” to team members, including requesting that the Road Agent 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 past events that have affected the Town and critical infrastructure within the Town.

The next meeting was scheduled for Wednesday, October 13, 2021.

**Emailed to the Team before meeting one along with the first meeting Agenda, Acronyms & Abbreviations, and the State Hazards.*

MEETING 2, OCTOBER 13, 2021

Virtual meeting attendance included Phil Cloutier, Austin Holmes, Matt Dustin, Jeff Stewart, Denise Vallee, Judy Leblanc (Select Board), David Backler (Superintendent), Olin Garneau, and June Garneau.

The meeting began with a review of the work done at the previous meeting. First, the Planner reviewed *Table 2.1, Town Statistics*, to ensure the Town data was accurate; some minor changes were made. Next, the Planner reviewed *Table 3.1, Hazard Identification & Risk Assessment (HIRA)*, to ensure the Team felt the Town's hazards were in the correct order. The Team felt that Cyber Events should be in the high category, so the Planner made adjustments to suit the Town better.

Next, the Team finished the Hazard Descriptions that were started at the previous meeting. After completing the descriptions, the Team moved to *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 2016 plan were examined; a few 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 Resources were analyzed for their "Hazard Risk".

With time running out, the Planner reviewed what would occur at the next meeting and thanked the Team. The next meeting was set for November 10, 2021.

MEETING 3, NOVEMBER 10, 2021

Virtual meeting attendance included Phil Cloutier, Austin Holmes, Jeff Stewart, Denise Vallee, Judy Leblanc, Olin Garneau, and June Garneau.

First on the agenda was to finish and review *Tables 4.1-4.4, Critical Infrastructure & Key Resources*, which was started at the previous meeting. Some minor changes were made to the table from the 2016 plan.

The Team then began work on *Table 3.2, Historic Hazard Identification*, which lists past and potentially hazardous locations or events. First, they looked at the hazards in the last plan and

Meeting 2 – October 13, 2021

1) Last Meeting

- a) Reviewed planning process, purpose, funding & collaboration.
- b) Reviewed of community involvement and stakeholders
- c) Worked on....
 - i) Table 2.1, Town Statistics
 - ii) Table 3.1, Hazard Identification & Risk Assessment (HIRA)
 - iii) Hazard Descriptions (did not finish)

2) Today's Topics

- a) Review....
 - i) Table 2.1, Town Statistics
 - ii) Table 3.1, Hazard Identification & Risk Assessment (HIRA)
- b) Finish....
 - i) Hazard Descriptions
- c) Work on....
 - i) Table 4.1-4.4, Critical Infrastructure & Key Resources
 - ii) Table 3.2, Historic Hazard Identification
 - 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) Wednesday, November 10, 2021 @ 9:00 AM
- b) Wednesday, December 8, 2021 @ 9:00 AM
- c) Wednesday, January 12, 2022 @ 9:00 AM
- d) Wednesday, February 9, 2022 @ 9:00 AM

Meeting 3 – November 10, 2021

1) Last Meeting

- a) Reviewed....
 - i) Table 2.1, Town Statistics
 - ii) Table 3.1, Hazard Identification & Risk Assessment (HIRA)
- b) Finished....
 - i) Hazard Descriptions
- c) Worked on....
 - i) Table 4.1-4.4, Critical Infrastructure & Key Resources

2) Today's Topics

- a) Review....
 - i) Table 4.1-4.4, Critical Infrastructure & Key Resources
- b) Work on....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 6.1, Current Plans, Policies & Mutual Aid (time allowing)
 - iii) 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) Wednesday, December 8, 2021 @ 9:00 AM
- b) Wednesday, January 12, 2022 @ 9:00 AM
- c) Wednesday, February 9, 2022 @ 9:00 AM

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.

Table 7.1, Accomplishments since the Last Plan, also pre-populated with data from the 2016 plan, was the last agenda item. The Planner discussed each strategy to determine which had been “Completed”, should be “Deleted”, or should be “Deferred” to this Plan as a new mitigation action item. Some of the action items from the 2016 plan had been completed or partially completed by the Town. Some were deleted as they were deemed to be no longer useful or considered emergency preparedness, not mitigation. Still, others were “deferred” for consideration as new “Action Items” for this Plan. The Planner promised to translate her notes into paragraphs to review at the next meeting.

The next meeting was set for December 8, 2021, but was later changed to January 12, 2022.

MEETING 4 – JANUARY 12, 2022

Virtual meeting attendance included Phil Cloutier, Austin Holmes, Jeff Stewart, Denise Vallee, David Backler, Paul Robitaille (Planning Board), 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 where the urban environment interfaces with the wildland environment and the most prone area to the risk of wildfires. In Gorham, it was noted that the WUI would cover the entire town due to the abundance of forested land. Mitigation strategies were discussed to protect structures and educate the Town’s citizens about wildfire risk.

Next, the Planner walked the Team through a complete review of Table 7.1. Having translated 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 twenty 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 kept them as reminders to complete these important action items.

Then the Team worked on *Table 6.1, Current Plans, Policies & Mutual Aid*; like other tables, this table was also pre-populated with information from the 2016 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 the final table, *Table 9.1, The Mitigation Action Plan*.

Meeting 4 – January 12, 2022

1) Last Meeting

- a) Finished and reviewed....
 - i) Table 4.1-4.4, Critical Infrastructure & Key Resources
- b) Worked on....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 7.1, Accomplishments since the prior Plan

2) Today’s Topics

- a) Review....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 7.1, Accomplishments since the prior Plan
- b) Work on....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid
 - ii) Start thinking about mitigation strategies
 - iii) Table 9.1, Mitigation Action Plan (time allowing)
 - iv) STAPLEE (time allowing)

3) Homework

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

4) Future Meetings

- a) Wednesday, January 12, 2022 @ 9:00 AM
- b) Wednesday, February 9, 2022 @ 9:00 AM

With time running out, Table 6.1 was not completed. The Planner adjourned the meeting and promised to write statements to support the concepts and ideas expressed for Table 6.1. The next meeting was scheduled for February 9, 2022.

MEETING 5 – FEBRUARY 9, 2022

Virtual meeting attendance included Phil Cloutier, Austin Holmes, Jeff Stewart, Denise Vallee, David Backler, Paul Robitaille, Jeff Tennis (Water & Sewer Superintendent), Olin Garneau, and June Garneau.

The meeting began with an overall recap of the work already 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*
- *Table 7.1 – Accomplishments since the Last Plan*

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

Meeting 5 – February 9, 2022

- 1) Last Meeting
 - a) Reviewed....
 - i) Table 3.2, Historic Hazard Identification
 - ii) Table 7.1, Accomplishments since the prior Plan
 - b) Worked on....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid (did not finish)
- 2) Today's Topics
 - a) Review and finish....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid
 - b) Work on....
 - i) Start thinking about mitigation strategies
 - ii) Table 9.1, Mitigation Action Plan
 - iii) STAPLEE
- 3) Homework
 - a) Review materials sent by MAPS
 - b) Digital Photos – contributions welcome

In addition to the action items identified in Tables 6.1 and 7.1, the Team reviewed additional potential action items, including a comprehensive list of mitigation strategies derived from several sources and the *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards January 2013*. (See Chapter 8, Sections A & B, and Appendix F).

Next, the Team reviewed Table 6.1 to ensure that the comments and ideas expressed by the Team were fully represented. Then, the Team finished the items not completed at the previous meeting. Work on this table resulted in thirteen new “Action Items” for this Plan, some of which are also in Table 7.1.

The Planner showed documents detailing a comprehensive list of possible mitigation action items (see Chapter 8, Sections A & B, and Appendix F). The Planner also encouraged team members to explore the link on their agendas for the FEMA Mitigation Idea booklet to see if any of the strategies in this book would be helpful in Gorham (see right).

Link to explore:

FEMA Mitigation Ideas

https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf

The next meeting was scheduled for March 16, 2022, and the meeting was adjourned.

MEETING 6 – MARCH 16, 2022

Virtual meeting attendance included Phil Cloutier, Austin Holmes, Jeff Stewart, Denise Vallee, David Backler, Paul Robitaille, Olin Garneau, and June Garneau.

First, 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 and 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 the documents the Planner provided, the Team could go through the STAPLEE process for the identified action items. 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.

After considering 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, the Team ultimately settled on thirty-seven “Mitigation Action Items” that they felt were achievable and could help diminish the impact of natural hazards in the future.

The Planner advised the Team about what would occur during the next meeting on April 13, 2022. The meeting was adjourned.

MEETING 7 – APRIL 13, 2022

Virtual meeting attendance included Phil Cloutier, Austin Holmes, Jeff Stewart, Denise Vallee, Paul Robitaille, Olin Garneau, and June Garneau.

Upon determining the mitigation action items and completing the STAPLEE process, the Team was now ready to rank and prioritize the identified action items. Before the meeting, the Planner had pre-ranked the action items based on the time frame, the Town’s authority to accomplish the strategy, the type of strategy, and the STAPLEE score and placed them in four categories, as shown in Chapter 9, Section A. A handout of the identified action items was made for the Team. The Team determined changes that needed to be made using this handout, including changes in the “rank”.

Meeting 6 – March 16, 2022

1) Last Meeting

- a) Reviewed all material from previous meetings....
 - i) Tables 2.1, 3.1, 3.2, 4.1-4.4 & 7.1
 - ii) Hazard Descriptions
- b) Reviewed & finished....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid

2) Today’s Topics

- a) Review....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid
- 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) April 13, 2022 @ 9:00 AM

Meeting 7 – April 13, 2022

1) Last Meeting

- a) Reviewed all material from previous meetings....
 - i) Table 6.1, Current Plans, Policies & Mutual Aid
- b) Worked on....
 - i) Table 9.1, Mitigation Action Plan
 - ii) STAPLEE

2) Today’s Topics

- a) Work on....
 - i) Ranking & Priority of Action Items

3) Homework

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

4) Future Meetings

- a) _____

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 in their rankings and in which order they would be accomplished.

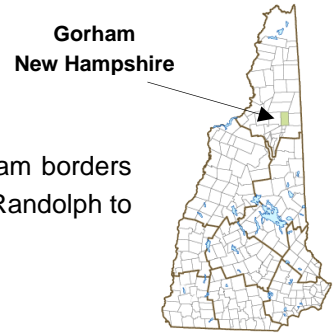
The Team's work was finished with Tables 8.1 and 9.1 completed, except for the final review. The Planner agreed to put the final “draft” plan together and email a copy for the Team’s review. The Planner explained the process from this point forward and thanked the Team for their hard work. No additional meeting was scheduled.

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

Chapter 2: Community Profile

A. INTRODUCTION

Gorham is a beautiful community in Coos County in northern New Hampshire. Gorham borders Berlin to the north, Shelburne to the east, two unincorporated places to the south, and Randolph to the west. Gorham is in the White Mountains Tourism Region.



TOWN GOVERNMENT

A three-member Select Board governs the Town of Gorham, with a Town Manager overseeing the Town's day-to-day operations. The Town's departments include, but are not limited to, Fire/EMS, Police, Public Works, Water & Sewer, Planning, Zoning, Recreation, Library, and Conservation. The largest employers in Gorham are Berlin City Auto Group, with 243 employees, and Wal-Mart, with 242 employees. Gorham Paper & Tissue, with 105 employees, and Family Resource Center, with 73 employees, are the next in line.

DEMOGRAPHICS & HOUSING

Gorham's population has decreased from 3,204 in 1990 to 2,698 in 2020, showing a decrease of 506, according to the US Census 2020.⁴ This data represents a negative growth rate of approximately 15.8%.

There are an estimated 1,467 housing units, most of which are occupied (1,279), while vacant housing units total 188, thus confirming the presence of second homes.⁵ The estimated median household income is \$54,325, and the median age is 54.7 years.⁶

EDUCATION & CHILD CARE

Gorham students in grades K-5 attend Edward Fenn Elementary School in Gorham. Students in grades 6-12 attend Gorham Middle/High School in Gorham. There is one private school in Gorham, Salve Regina Academy, which has students from grades K-8. There are no colleges/universities in the Town; however, there are three childcare facilities with a capacity of 211.

Incorporated: 1836

Origin: This territory was first granted in 1770 as part of Shelburne called Shelburne Addition. Shelburne settlers petitioned the Legislature in 1786 for an addition of land because they felt a large portion of their grant was useless due to the mountains and rocks. It was incorporated as a separate town in 1836 and renamed Gorham at the suggestion of Sylvester Davis, a resident from Gorham, Maine, and a relative of the Gorham family who founded that town in 1764. The Gorham family has long been part of New England history, first settling in Barnstable, Massachusetts, in 1643.

Villages and Place Names: Mount Washington, Upper Village, Cascade, Lead Mines

Population, Year of the First Census Taken: 111 residents in 1830

Population Trends: Population change for Gorham decreased by 301 residents, from 3,039 in 1960 to 2,738 in 2013. Gorham was one of nine communities that lost population over 53 years. The 2013 Census estimate for Gorham was 2,738 residents, which ranked 114th among New Hampshire's incorporated cities and towns.

Population Density and Land Area, 2013 (US Census Bureau): 87.4 persons per square mile of land area. Gorham contains 31.9 square miles of land area and 0.4 square miles of inland water area.

Source: Economic & Labor Market Information Bureau, NH Employment Security, October 2022; Received 8/19/2022

⁴ US Census 2020

⁵ 2020 DEC Redistricting Data

⁶ American Community Survey (ACS) 5-Year Estimate Data

NATURAL FEATURES

The Town of Gorham covers approximately 31.9 square miles of land area and 0.4 square miles of inland water. The Community is dominated by the mountains and hills of northern New Hampshire. The lowest elevation in town is around 800' above sea level; most of the Community is over 1,000 feet above sea level, which leaves it vulnerable to ice storms. The highest point is a spur of Mount Madison at 3,030' above sea level.

Vegetation in Gorham is typical of northern New England, including deciduous and conifer forests, open fields, swamps, and riverine areas. The terrain lends itself to many small ponds, streams, and rivers, most notably the Androscoggin River, the Peabody River, the Moose River, and Mascot Pond.

TRANSPORTATION

Two significant roadways run through Gorham: US Route 2 and NH Route 16. US Route 2 enters Gorham from Randolph to the west and meets NH Route 16 as they run together as "Main Street". Route 2 continues eastwardly into Shelburne and Maine on the eastern end of town. NH Route 16 enters Gorham from Berlin in the north, and after passing through town as "Main Street", it travels south into Pinkham Notch and Conway. Routes 2 and 16 are the Town's major evacuation routes. Other smaller and less traveled roadways lend access to other areas of the Town. All roadways in Gorham are susceptible to hazards such as road flooding and high winds leading to downed trees in the roadways and potential hazardous materials spills. The Town also has an active railroad line running through the center of the Town.

B. EMERGENCY SERVICES

EMERGENCY OPERATIONS CENTER & EMERGENCY MANAGEMENT DIRECTOR

The Town of Gorham 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. In Gorham, the designated EOC is the Town Office Complex.

FIRE DEPARTMENT & EMS

Gorham Fire & EMS is a paid-on-call fire department providing quality fire services to the residents and visitors of Gorham 24 hours a day, 365 days a year. The department staffs a full-time Chief, six full-time s, 15 paid-on-call EMTs, and 30 paid-on-call firefighters and operates two stations within the Community. Emergency medical services and medical transportation are provided by Gorham Fire & EMS. The Fire Department and area departments participate in the Northern NH Fire Mutual Aid Pact (NORPAC).

POLICE DEPARTMENT

The Gorham Police Department is a full-time department providing law enforcement services to the residents and visitors of Gorham 24 hours a day, 365 days a year. The department staffs a full-time Chief, six full-time and three part-time officers. The Gorham Police Department has mutual aid agreements with surrounding towns, NH Fish & Game, the Coos County Sheriff's Office, and the NH State Police.

PUBLIC WORKS DEPARTMENT (PWD)

The Gorham Public Works Department (PWD) operates year-round, 24-hour basis as needed. The department's mission is to support the citizens of Gorham through the safe operation, proper maintenance, and future development of highways, supporting infrastructure and utilities cost-consciously without sacrificing quality. The department staffs a full-time Director, Foreman, Office Manager, nine employees, and three part-time employees. The department belongs to the NH Public Works Mutual Aid Association.

MEDICAL FACILITIES

Gorham's closest medical facility is Androscoggin Valley Hospital in Berlin (9 miles, 25 beds). If the need arises, alternative medical facilities are Weeks Medical Center in Lancaster (25 miles, 25 beds) and Memorial Hospital in Conway (27 miles, 25 beds).

EMERGENCY SHELTER(S)

The primary shelter is where evacuees are directed during an emergency. In Gorham, the designated primary shelter is the Gorham Middle/High School, which offers a large sleeping area, restrooms, showers, and kitchen facilities. The designated secondary shelter for the Town is the Edward Fenn Elementary School. The Gorham Middle/High School does not have a generator; however, the Town is seeking funding to install one (see **Action Item #27** in Table 9.1).

C. GORHAM'S CURRENT & FUTURE DEVELOPMENT TRENDS

Nearly every New Hampshire community experienced a significant drop in new home construction after the Great Recession of 2008. Gorham was no exception. Between 2008 and 2012, single-family new home construction in Gorham was consistent with New Hampshire trends. New single-family home construction remained slow during pre-pandemic years, although there was a slight increase, as shown in the chart (see right) from City-Data.com⁷.

Since the pandemic's beginning in 2020, development in New England has undergone several changes. One of the most significant changes was occasionally used homes modified as permanent residents. Lot line adjustments and minor subdivisions were also quite common. Then, there was a real estate boom; in Gorham, houses were only on the market for four to five days. The real estate boom lasted through 2022, settling to more moderate levels by the fall.

Another trend, particularly in tourist areas such as Gorham, was for property owners to participate in short-term rental programs, such as Air B&B. Approximately 25-30 new Air B&Bs were established in Gorham during this period.

Single-family new house Construction building permits

- 1998: 3 buildings, average cost: \$33,300
- 1999: 11 buildings, average cost: \$101,700
- 2000: 9 buildings, average cost: \$118,000
- 2001: 8 buildings, average cost: \$121,400
- 2002: 5 buildings, average cost: \$208,000
- 2003: 7 buildings, average cost: \$134,100
- 2004: 11 buildings, average cost: \$150,000
- 2005: 10 buildings, average cost: \$150,200
- 2006: 10 buildings, average cost: \$230,000
- 2007: 9 buildings, average cost: \$120,000
- 2008: 6 buildings, average cost: \$150,000
- 2009: 1 building, cost: \$40,000
- 2011: 1 building, cost: \$220,300
- 2012: 1 building, cost: \$184,000
- 2017: 3 buildings, average cost: \$267,800
- 2018: 3 buildings, average cost: \$249,800
- 2019: 3 buildings, average cost: \$249,800

⁷ City-Data.com; <http://www.city-data.com/city/Gorham-New-Hampshire.html>

The Gorham Planning Board's process for all subdivision and site plan applications is robust. It involves on-site examinations and the expertise of other departments and commissions as appropriate and coordination through the Gorham Technical Review Committee, a collection of department heads and other town officials.

Regulations are designed to meet state regulations, address potential hazards and climate change, and maintain the Community's local character. Gorham's regulations address wetland areas, stormwater flow, and fire protection and require all large subdivisions and commercial enterprises to address water availability. New development approval requires live hydrants, cisterns, sprinklers, or other fire mitigation provisions as appropriate. All development that has occurred or is proposed in hazard-prone areas has been closely monitored and mitigated to reduce the Town's hazard vulnerability.

Changes to Zoning in 2020 have allowed more medium to high-income housing and second homes to be built, some of which may be near or within the Wildland Urban Interface (WUI). As Gorham is heavily forested, building within the WUI is always a concern. However, the Gorham Technical Review Committee's review and current ordinances provide safeguards, such as defensible space education, to help mitigate wildfire risk. The Town has also added new regulations to track the B&B market and has initiated a dark skies and stormwater ordinance.

In Gorham, development has been slow but very well-regulated. The Planning Board reported, *"There were seven applications made to the board in 2021: 1) an application for Big Day Brewing/Barker Mtn Bikes was submitted to the board and approved in February, 2) in July a new application was submitted to expand this project. That application was approved in July 2021. 3) two applications were denied as they did not meet the requirements of the Site Plan Review regulations, 4) one application was continued. There were also two applications for Lot Line Adjustment, both of which were approved."*⁸

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. The Planning Board, the Code Enforcement Officer, the Town Manager, and the Select Board will monitor and guide growth and development using the Master Plan, Subdivision Regulations, the Site Plan Review process, the Zoning Ordinance, and the expertise of the Technical Review Committee. Building permits are required.

As a relatively small community, the Code Enforcement Officer, the Planning Board, the Select Board, the Town Manager, and other town officials are almost always aware of construction that is taking place. 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.

⁸ Town Gorham, 2021 Annual Report, Planning Board Report, page 59

TABLE 2.1: TOWN STATISTICS

Town Statistics				
Census Population Data	2020	2010	2000	1990
Gorham, NH - Census Population Data	2,698	2,848	2,902	3,204
Coos County	31,268	33,055	33,156	34,879
Elderly Population-% over 65 (2021 ACS 5-Year)	28.5%			
Median Age (2021 ACS 5-Year)	54.7			
Median Household Income (2021 ACS 5-Year)	\$54,325			
Individuals below the poverty level (2021 ACS 5-Year)	3.2%			
Change in Population-Summer & Winter Weekends (%)	300%			
Change in Population-Summer Vacation Times (%)	200%			
Housing Statistics (2020 DEC Redistricting Data)				
Total Housing Units	1,467			
Occupied Housing Units	1,279			
Vacant Housing Units	188			
Buildings Value Only - 2022-MS1 (provided by the Town)				
Assessed Structure Value (2022-MS1)	Value		1% Damage	5% Damage
Residential Buildings	\$165,325,400		\$1,653,254	\$8,266,270
Manufactured Housing	\$11,018,200		\$110,182	\$550,910
Commercial Buildings	\$71,643,140		\$716,431	\$3,582,157
Tax Exempt Buildings	\$29,083,300		\$290,833	\$1,454,165
Utilities	\$73,113,600		\$731,136	\$3,655,680
Total	\$350,183,640		\$3,501,836	\$17,509,182
Regional Coordination				
County	Coos			
Tourism Region	White Mountains			
Municipal Services & Government				
Town Manager	Yes, appointed			
Select Board (3 member)	Yes, elected			
Planning Board	Yes, elected			
School Board	Yes, elected			
Zoning Board of Adjustment	Yes, appointed			
Conservation Committee	Yes, appointed			
Master Plan	Yes, January 15, 2020			
Emergency Operation Plan (EOP)	Yes, May 10, 2021			
Hazard Mitigation Plan (HMP)	Yes, May 17, 2016			
Zoning Ordinances	Yes, 2021			
Subdivisions Regulations	Yes, 2021			
Site Plan	Yes, 2021			
Capital Improvement Plan	No, a Capital Improvement Committee has been formed			

Town Statistics	
<i>Capital Reserve Funds</i>	Yes, reviewed annually
<i>Building Permits Required</i>	Yes
<i>Town Web Site</i>	Yes, www.gorhamnh.org
<i>Floodplain Ordinance</i>	Yes, part of the Zoning Ordinance
<i>Member of NFIP</i>	Yes, April 1, 1981
<i>Flood Insurance Rate Maps (DFIRMS)</i>	February 20, 2013
<i>Flood Insurance Rate Study (FIS)</i>	February 20, 2013
Percent of Local Assessed Valuation by Property Type-2021 (NH Department of Revenue)	
<i>Residential Buildings</i>	48.5%
<i>Commercial Land & Buildings</i>	28.4%
<i>Other (including Utilities)</i>	23.1%
Emergency Services	
<i>Town Emergency Warning System(s)</i>	CodeRED, Brookfield dam failure horn
<i>School Emergency Warning System(s)</i>	One Call Now
<i>Emergency Page</i>	Yes
<i>Facebook Pages</i>	Gorham Fire & EMS, Police Department, Parks & Rec, Town of Gorham, Medallion Opera House, Edward Fenn Elementary, Gorham Middle/High School
<i>ListServ</i>	E-Alert, signup on the website
<i>Local Newspapers</i>	Berlin Sun, Berlin Reporter (weekly)
<i>Public Access TV</i>	No
<i>Local TV Stations</i>	WMUR Channel 9
<i>Local Radio</i>	NHPR 107.1 FM (Berlin), WPKQ 103.7 FM (North Conway)
<i>Police Department</i>	Yes, full-time Chief, 6 full-time officers, 3 part-time officers
<i>Police Dispatch</i>	Gorham Emergency Dispatch
<i>Police Mutual Aid</i>	Surrounding towns, NH State Police, Coos County Sheriff's Office, Fish & Game
<i>Animal Control Officer</i>	Police Department
<i>Fire Department</i>	Yes, full-time Chief, six full-time EMS providers, 15 paid-on-call EMTs, 30 paid on-call firefighters
<i>Fire Dispatch</i>	Gorham Emergency Dispatch
<i>Fire Mutual Aid</i>	Northern NH Fire Mutual Aid Pact (NORPAC)
<i>Fire Stations</i>	Two (one in Cascade Flats)
<i>Fire Warden</i>	Yes
<i>Emergency Medical Services</i>	Gorham Fire & EMS
<i>EMS Dispatch</i>	Gorham Emergency Dispatch
<i>Emergency Medical Transportation</i>	Gorham Fire & EMS
<i>HazMat Team</i>	Contact NH State Fire Marshal
<i>Established EMD</i>	Yes
<i>Established Deputy EMD</i>	Yes

Town Statistics	
<i>Line of Succession (should EMD be out of town)</i>	1st...Deputy EMD
	2nd...Fire Chief or designee
	3rd...Police Chief or designee
	4th...Town Manager or designee
<i>Regional Public Health Network</i>	North Country Regional Public Health Network
<i>Health Officer</i>	Yes
<i>Deputy Health Officer</i>	Yes
<i>Code Enforcement Officer</i>	Yes
<i>Established Public Information Officer (PIO)</i>	Yes
<i>Nearest Hospital(s)</i>	Androscoggin Valley Hospital, Berlin (9 miles, 25 beds)
	Weeks Medical Center, Lancaster (25 miles, 25 beds)
	Memorial Hospital, Conway (27 miles, 25 beds)
<i>Local Humane Society or Veterinarians</i>	North Country Animal Hospital (Gorham), Conway Area Humane Society (Conway)
<i>Primary EOC</i>	Town Office Complex (generator)
<i>Secondary EOC</i>	Fire Station (portable generator)
<i>Primary Shelter</i>	Gorham Middle/High School (no generator)
<i>Secondary Shelter</i>	Edward Fenn Elementary School (generator)
<i>Other Possible Shelters</i>	Town Hall, Congregational Church, Holy Family Church, The Quality Inn, Town & Country (Shelburne)
Utilities	
<i>Town Sewer</i>	Gorham Sewer Department
<i>Public Works Department</i>	Yes, full-time Director, full-time Foreman, full-time Office Manager, 9 full-time employees, 3 part-time employees
<i>Public Works Mutual Aid</i>	Yes
<i>Class V Roads</i>	19 paved, 1 gravel, 20 total
<i>Water Supply</i>	Gorham Water & Sewer Department
<i>Wastewater Treatment Plant</i>	Yes
<i>Electric Supplier</i>	Eversource
<i>Natural Gas Supplier</i>	Portland Natural Gas Transmission System (PNGTS)
<i>Cellular Telephone Access</i>	Yes
<i>Pipelines</i>	Yes (2), Portland Natural Gas & Portland Oil (empty)
<i>High-Speed Internet</i>	Yes
<i>Telephone Company</i>	Consolidated Communications
Transportation	
<i>Primary Evacuation Routes</i>	US Route 2 & NH Route 16
<i>Secondary Evacuation Routes</i>	Pinkham B Road (snowmobile only in winter), Church St./Promenade St./Sandpit/Union St. or Dublin St., Church St./Shady Ln./Ed Fenn/Union St. (small vehicles only), Casey's Way (Multi-Modal Road)
<i>Nearest Interstate</i>	I-93, Exit 35 (35 miles)
<i>Nearest Airstrip</i>	Gorham Airport (2,800 ft. turf runway)

Town Statistics		
Nearest Commercial Airport(s)	Portland International Jetport, Portland, ME (92 Miles)	
	Manchester-Boston Regional Airport, Manchester (94 Miles)	
Public Transportation	North Country Transit (NCT)	
Active Railroad	St. Lawrence & Atlantic; mostly freight	
Education & Childcare		
Elementary School	Edward Fenn Elementary School grades K-5	
Middle/High School	Gorham Middle/High School grades 6-12	
School Administrative Unit	SAU 20	
Private School(s)	Yes, Salve Regina Academy grades K-8	
Licensed Childcare Facility	3 facilities, 211 capacity	
Colleges/Universities	No	
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	31.90	100.0%
Approximate Total Un-Conserved Land	12.55	39.3%
Approximate Total Conserved Land	19.35	60.7%
*Municipal/County Land (1)	8.33	26.1%
Federal Owned Land (2)	9.33	29.2%
State Owned Land (3)	1.29	4.0%
Quasi Private (4)	0.00	0.0%
Private Land (5)	0.40	1.3%
*In 2020, 2,020 acres (approximately 3.16 square miles) were added to the Town Forest; this addition is reflected in the analysis above.		
Fire Statistics (NH Division of Forests & Lands & the Town of Gorham)		
Wildfire Fires (2016-2021)	2019, 3-acre off North Main Street	
Coos County Fire Statistics (2021)	7 fires, 1.03 acres	
State Forest Fires Statistics (2021)	180 fires, 105 acres	
Unless otherwise noted, Table 2.1 was derived from the Town of Gorham, US Census 2020, and the Economic & Labor Market Information Bureau, NH Employment Security, October 2022. Community Response Received 8/19/2022; http://www.nh.gov/nhes/elmi/html/profiles/pdfs/gorham.pdf		

Chapter 3: Hazard Identification, Risk Assessment & Probability

A. HAZARD IDENTIFICATION

The first step in hazard mitigation is to identify hazards. The Team determined eleven natural hazards that can potentially 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 probability estimate for each hazard is multiplied by its severity to establish an overall relative threat factor.

Some hazards in Table 3.1 include subcategories of hazards. For instance, Severe Winter Weather includes snowstorms, ice storms, blizzards, and nor'easters. In such instances⁹, the analysis included a discussion of the subcategories. However, ultimately, the final analysis was based on the category in general, as shown in Table 3.1.

The NH State Hazard Mitigation Plan includes many of the same potential hazards identified in Gorham. However, several of the State's hazards were excluded from this Plan as they ranked "0" while developing the HIRA. 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 radiological sites

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 on 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 classification¹⁰. 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 and 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 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 Inland Flooding (Riverine, 100-year, local road flooding, ice jams, dam failure); Extreme Temperatures (hot & cold); High Wind Events (Tornadoes & Downbursts); Infectious Diseases (too many to list)

¹⁰ 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

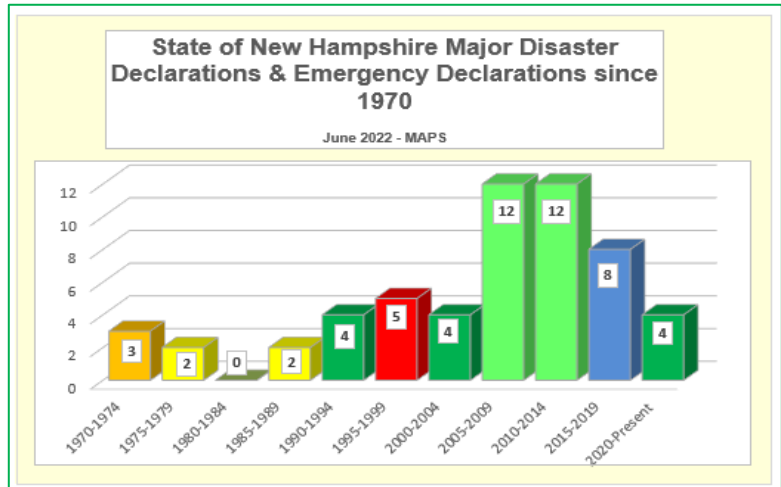
The determination of the probability of occurrence is contained within Column D in Table 3.1, which assesses hazards based on the likelihood that the hazards will occur within 25 years. The probability scores indicate whether the identified hazard has a *Very Low, Low, Moderate, High, or Very High* probability. Probability categories are also indicated in Chapter 5, Sections B-D.

Gorham is reasonably safe from natural, technological, and human-caused hazards. However, due to Gorham's geographic location, within the high peaks of the White Mountains, forested lands, hills, heavy snowpack, and topography, 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 Guide¹¹. 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.¹² 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 Gorham, are becoming increasingly aware of climate change's impact on the hazards already experienced and anticipate an increase in probability in the future. Gorham takes climate change seriously; one project that has moved forward is solar for the Ed Fenn Elementary School. Charging stations within the Community are also being discussed.

HAZARD PROBABILITY COMBINED WITH LONG-TERM UTILITY OUTAGE

Any potential disaster in Gorham is particularly impactful if combined with a long-term utility outage, as would most likely be true 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, a 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.

¹¹ State Mitigation Plan Review Guide, FEMA, Released March 2015, Effective March 2016, Section 3.2, page 13

¹² 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)

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 8.0-11.9 Medium 4.0-7.9
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 0-3.9
5=Very High (81-100%)							
Natural Hazards							
1) Inland Flooding	2.00	3.00	2.00	4.00	2.33	9.33	High
2) Severe Winter Weather	2.00	4.00	3.00	3.00	3.00	9.00	High
3) High Wind Events	2.00	4.00	2.00	3.00	2.67	8.00	High
4) Tropical & Post-Tropical Cyclones	1.00	3.00	2.00	3.00	2.00	6.00	Medium
5) Infectious Diseases	2.00	1.00	3.00	3.00	2.00	6.00	Medium
6) Landslide & Erosion	1.00	3.00	2.00	3.00	2.00	6.00	Medium
7) Extreme Temperatures	2.00	1.00	1.00	4.00	1.33	5.33	Medium
8) Wildfires	1.00	2.00	1.00	3.00	1.33	4.00	Medium
9) Drought	1.00	1.00	1.00	3.00	1.00	3.00	Low
10) Lightning & Hail	1.00	2.00	1.00	1.00	1.33	1.33	Low
11) Earthquakes	1.00	1.00	1.00	1.00	1.00	1.00	Low
Technological Hazards							
1) Long Term Utility Outage	2.00	2.00	3.00	2.00	2.33	4.67	Medium
2) Dam Failure	2.00	3.00	2.00	2.00	2.33	4.67	Medium
3) Hazardous Materials	1.00	3.00	2.00	2.00	2.00	4.00	Medium
4) Conflagration	1.00	2.00	3.00	2.00	2.00	4.00	Medium
5) Known & Emerging Contaminants	2.00	1.00	1.00	3.00	1.33	4.00	Medium
6) Aging Infrastructure	1.00	2.00	2.00	1.00	1.67	1.67	Low
Human-Caused Hazards							
1) Cyber Events	1.00	2.00	3.00	4.00	2.00	8.00	High
2) Transport Accidents	2.00	2.00	2.00	3.00	2.00	6.00	Medium
3) Mass Casualty Incidents	2.00	2.00	1.00	3.00	1.67	5.00	Medium
4) Terrorism & Violence	2.00	2.00	1.00	2.00	1.67	3.33	Low

D. NATIONAL FLOOD INSURANCE PROGRAM (NFIP) STATUS

Gorham entered the National Flood Insurance Program on April 1, 1981. The floodplain areas of Gorham are primarily along the Androscoggin, Peabody, and Moose Rivers; other small streams and brooks throughout town may also experience flooding. According to the latest digital flood insurance rate map (DFIRM), dated February 20, 2013, there is a substantial 100-year flood zone and a 50-year flood zone within Gorham. The latest flood insurance rate study (FIS) is also dated February 20, 2013. The latest FIRM and FIS are “incorporated by reference” when amended in the Gorham Floodplain Development Ordinance, adopted as part of the Zoning Ordinance (2021).

According to the Office of Strategic Initiatives (OSI), there are 27 NFIP policies in Gorham, including twenty-two single-family and five non-residential policies. There have been 24 paid losses for a total of \$146,067. The BEA/OSI also reports two repetitive losses of one building for a total of \$6,493.57 in repetitive loss payments.¹³ The repetitive loss properties formerly identified in Gorham have been mitigated.

The Floodplain Development Ordinance states:

“This ordinance, adopted pursuant to authority of RSA 674:16, shall be known as the Town of Gorham Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement the regulations in the Town of Gorham Zoning Ordinance, and shall be considered part of the Zoning Ordinance for purposes of administration and appeal under State law. If any provisions of this ordinance differ or appear to conflict with any provisions of the Zoning Ordinance or other ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall be controlling. The following regulations in this ordinance shall apply to all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its “Flood Insurance Study for the Town of Gorham, N.H.” (FIS) together with the associated Flood Insurance Rate Maps (FIRM), and Flood Boundary & Floodway Map dated May 2, 1994 and as amended from time to time, which are hereby incorporated by reference.”¹⁴



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>

¹³ NH Office of Strategic Initiatives (OSI); Jennifer Gilbert, October 10, 2022

¹⁴ Town of Gorham Floodplain Development Ordinance

The Floodplain Development Ordinance goes on to include the standard sections that are found in most NH floodplain ordinances. The sections are as follows; quoted material (*italic*) is taken from the Gorham Floodplain Development Ordinance:

Item I Definition of terms

Item II *“All proposed development in any special flood hazard area shall require a permit.”*

Item III Discusses the review of all applications by the Building Inspector and the requirements to keep building sites *“reasonably safe from flooding”*.

Item IV Discusses water and sewer systems and assurances that these systems are *“...designed to minimize or eliminate infiltration of flood waters into systems...”*

Item V Discusses the information needed *“for all new or substantially improved structures located in zones A and AE...”*

Item VI *“The Building Inspector shall not grant a building permit until...all necessary permits have been received...”*

Item VII Discusses riverine situations and watercourses and states, *“No encroachments, including fill, new construction, substantial improvements, and other developments are allowed within the floodway that would result in any increase in flood levels within the Community during the base flood discharge.”*

Item VIII Discusses 100-year flood elevation, lowest floor requirements for Zones AE and A, floodproofing, recreational vehicles, manufactured homes, and areas below the lowest floor.

Item IX Discusses variances and appeals.

The Town uses the Floodplain Development Ordinance to guide development and ensure compliance and enforcement of NFIP standards. The Planning Board (initiator) and the Select Board (enforcer) adhere to the rules, regulations, and requirements outlined in the ordinance. The Gorham Zoning Ordinance can be found on the Town’s website.¹⁵ The Team understands that the benefits of the NFIP also extend to structures not in the 100-year floodplain and felt it worthwhile to have NFIP brochures and information available at the Town Hall for current homeowners and potential developers. Several flood-related mitigation strategies have been added to this Plan.

Gorham’s Floodplain Administrator is responsible for determining substantial improvement and damage. These determinations are made for all development in a special flood hazard area that proposes to improve an existing structure, including alterations, movement, enlargement, replacement, repair, additions, rehabilitations, renovations, repairs of damage from any origin (such as, but not limited to flood, fire, wind, or snow) and any other improvement of or work on such structure including within its existing footprint.

¹⁵ https://www.gorhamnh.org/sites/g/files/vyhlf621/f/uploads/2016_zoning_ordinance.pdf

The Floodplain Administrator, in coordination with any other applicable community official(s), shall be responsible for the following:

- Determine if a substantial damage (SD) determination needs to be made and communicate SD and permit requirements to property owners.
- Verify the cost of repairs to the structure.
- Verify the market value of the structure.
- Make the SD determination and issue it to the property owner.
- Permit development/ensure compliance with community ordinance.
- Inspect development and maintain as-built compliance documentation post-construction.

The Town of Gorham complies with the National Flood Insurance Program requirements through its Floodplain Management Ordinance and other best practices. 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 Gorham.

TABLE 3.2: HISTORIC HAZARD IDENTIFICATION

Key for Table 3.2

2016 HMPT 2016 Hazard Mitigation Planning Team
2024 HMPT 2024 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. Flooding includes inland flooding, riverine flooding, heavy rainfall, rapid snowmelt, ice jam flooding, flooding due to dam failure, and local road flooding. Riverine flooding is the most common disaster event in the State of NH. Significant riverine flooding in some areas of the State occurs in less than ten-year intervals and seems to increase 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. No significant flooding events have taken place in Gorham since July 2020.				
A summary of flood events, including Major Disaster & Emergency Declarations in the State & regionwide				
Flooding Prior to 1970	1927, 1936, 1938, 1943 (2), 1953, 1955, 1959		Spring and fall flooding events resulting from severe storms and heavy snowmelt	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-4624), 2021 (DR-4622)			
A detailed summary of flood events in the Community				
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). There was no significant impact in Gorham.	FEMA, 2016 HMPT & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
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 to August 14, spawning a tornado on July 24, 2008. No significant impact in Gorham.	FEMA, 2016 HMPT & 2024 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 (Memorial Day Weekend Storm). There was no significant impact in Gorham; Gorham Ambulance assisted Gilman, VT.	FEMA, 2016 HMPT & 2024 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 & 2024 HMPT
Inland Flooding (Heavy Rain)	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. No FEMA post-disaster funding was received. Gorham had no significant impact from this July storm; however, Spring Road and Stoney Brook required heavy equipment to remove road debris.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain)	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. This late October storm caused damage in several locations in Gorham. There was basement flooding at homes on Bangor Street, and the overflow of Moose Brook damaged Spring Road. The Town Hall also sustained damage; repairs were made to the third floor and the public meeting room. The Libby Recreation Complex had \$19,000 in damage; \$4,700 was paid by the Town, with FEMA picking up the rest.	FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Inland Flooding (Heavy Rain)	July 2020	Gorham	Moose Brook turned into a raging river and caused a culvert on private property to overflow, causing a washout of Jimtown Road and a protective berm on Moose Brook. Four inches of rain fell in an hour. The road was shut down briefly; all the water was gone three hours later. Two other spots on Gorham Heights Road had minor damage. The Town fixed these issues with no FEMA assistance.	2024 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. No significant wildfire events have occurred in Gorham since the prior hazard mitigation plan, except for a 3-acre fire off Main Street.

A 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 Coos County or Gorham.	FEMA & 2024 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 Coos County or Gorham.	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 Coos County or Gorham.	FEMA & 2024 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 Coos County or Gorham.	Local Resources
Wildfire (Dilly Cliff)	October 2017	Grafton County	The Dilly Cliff Fire in 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 Coos County or Gorham.	Local Resources

A detailed summary of wildfire events in the Community

Wildfire	2016	Behind the mill in Cascade	A small 1/2-acre brush fire occurred behind the mill in the Cascade area of Gorham. Like most fires, this fire was human-caused due to an improperly attended campfire.	2024 HMPT
Wildfire	2019	Off Main Street	3-acre fire off Main Street; work on train tracks caused sparks which caused the fire.	2024 HMPT
Wildfire	2021	Above Libby's on the other side of the river	A small 1/2-acre brush fire occurred above Libby's on the other side of the Peabody River. This fire was human-caused, most likely because of an improperly attended campfire.	2024 HMPT

Type of Event	Date of Event	Location	Description	Source
C. High Wind Events, including Tropical & Post-Tropical Cyclones, Tornadoes, Downbursts & Windstorms: Tornadoes are spawned by thunderstorms and occasionally hurricanes; tornadoes may occur singularly or in multiples. A downburst is a severe localized wind blasting down from a thunderstorm. Downbursts are not frequent in NH, but they are 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 is real but modest compared to other New England states. A hurricane that is downgraded to a tropical storm is more likely to have an impact in New Hampshire. Tornadoes and other wind events have the potential to impact the Community on a townwide basis. No significant high wind events have taken place in Gorham since Tropical Storms Irene and Sandy in 2011 and 2012, respectively.				
A summary of high wind events and tropical and post-tropical cyclone events, including Major Disaster & Emergency Declarations in the State & regionwide				
Tropical & Post-Tropical Cyclones	1804, 1869, 1938, 1944, 1954 (2), 1960, 1976, 1978, 1985, 1991 (DR-917), 1999 (DR-1305), 2005 (EM-3258), 2011 (EM-3333 & DR-4026), 2012 (EM-3360)		Number 4 (1938), Number 7 (1944), Carol (1954), Edna (1954), Donna (1960), Belle (1976), Amelia (1978), Gloria (1985), Bob (1991), Floyd (1999), Katrina (2005), Irene (2011), Sandy (2012)	See below
High Wind Events (Tornadoes)	1814, 1890, 1951, 1953, 1957, 1961, 1963, 2008 (DR-1782)		All listed tornadoes were reported as F2, except for the June 1953 tornado, which was reported as an F3.	See below
A detailed summary of the Community's high wind, tropical, and post-tropical cyclone events.				
Tropical & Post-Tropical Cyclone (Great New England Hurricane) Long-term Term Utility Outage	September 21, 1938	All Ten NH Counties	The Great New England Hurricane: Statewide, there were multiple deaths, and damages in NH were about \$12.3 million in 1938 dollars (about \$200 million now). 20,000 structures, 26,000 automobiles, 6,000 boats, and 325,000 sugar maples were lost or damaged throughout New England. 80% of the people lost power. Although there was no local recollection, it was expected that damage would have been similar to the rest of the State in Gorham. (Source http://nhpr.org/post/75th-anniversary-new-englands-greatest-hurricane)	FEMA & 2024 HMPT
Tropical & Post-Tropical Cyclone (Hurricanes Carol & Edna)	August 31, 1954	All Ten NH Counties	Hurricanes Carol & Edna: Hurricane Carol resulted in an extensive amount of trees blown down, damage to structures, and significant crop loss. 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 damage would have been similar to the rest of the State in Gorham. (Source: http://www.wmur.com/Timeline-History-Of-NH-Hurricanes/11861310)	FEMA & 2024 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 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 and all 10 New Hampshire counties. Gorham had no impact; however, several firefighters, as private individuals, went to Louisiana to assist.	FEMA, 2016 HMPT & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Tornado	2010	Brook Road	A tornado touched down, resulting in minor property damage to a couple of properties and tree damage	2016 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. In Gorham, Tropical Storm Irene brought flash flooding on the Peabody River as torrents of water flowed from the mountains at a high velocity; homes were flooded, and one home was moved off its foundation. Damage occurred on Stony Brook Road, White Birch Lane, and Libby Field. The Town received \$546,487.07 from FEMA for damage repair and spent \$182,162.36. Three National Resources Conservation Service (NRCS) projects assisted four homeowners with repairs (FEMA-\$421,404.75; Homeowners-\$140,468.25). For more information, see Chapter 5	FEMA, 2016 HMPT & 2024 HMPT
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, bringing high winds, power outages, and heavy rain to six New Hampshire counties. Downgraded to a tropical storm when it reached Gorham; heavy rain and flooding, much smaller scale than Tropical Storm Irene; within half an hour of recommending evacuations, opened Emergency Shelter (Fenn); see Chapter 5 for more details. The Peabody River overflowed its banks, flooding basements and leaving mud in some homes on Bangor Street. FEMA paid \$35,760.07 in post-disaster funding; the Town paid its 25% share of \$11,920.	FEMA, 2016 HMPT & 2024 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 have the potential to impact the Community on a townwide basis. Since the prior hazard mitigation plan, no significant winter weather events have occurred in Gorham.				
A summary of severe winter weather events, including Major Disaster & Emergency Declarations in the State & regionwide				
Severe Winter Weather (Ice Storms)	1942, 1969, 1970, 1979, 1991, 1998 (DR-1199), 2008 (DR-1812)	The major ice storms that have occurred causing major disruptions to power, transportation, and public and private utilities.		FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Severe Winter Weather (Snowstorms)	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)		The severe winter weather events marked by snowfalls exceeding 2' in parts of the State which resulted in disruptions to power and transportation systems.	FEMA & 2024 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 snow to 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. NH experienced difficulty with snow removal because of the great depths that had fallen from December 1968 to April 1969. In Gorham, the snow banks were so high that residents put indicators on their car antennas to see over the top. The Town received heavy equipment from the Corrigan Family to open Main Street. Snow was higher than the cars and, in some cases, up as high as second-story windows.	2024 HMPT
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. This storm also brought hurricane-force winds, which made this storm one of the more intense this century across the northeastern United States. Recorded accumulations show up to 28" in northeast New Hampshire, 25" in west-central New Hampshire, and 33" along coastal New Hampshire. There was no recollection of events in Gorham; however, it is expected that snow amounts in Gorham were similar to accumulation in the rest of the State. The Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 HMPT
Severe Winter Weather (Snowstorm & High Winds)	March 13-17, 1994	All Ten NH Counties	Emergency Declaration EM-3101: The Public Works Department handled the heavy snow accumulation in Gorham.	FEMA & 2024 HMPT
Severe Winter Weather (Ice Storm) Long-term 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. A major ice storm with trees down, power outages from a couple of days to two weeks in Gorham, roads closed, and extensive cleanup was needed. A very severe storm at elevations over 1,000 feet. Major harvest out of town forest for a couple of years.	FEMA, 2016 HMPT & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
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 that occurred in March 2001 and affected six New Hampshire counties. The Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 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 that occurred from December 6-7, 2003, and affected eight New Hampshire counties. The Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 HMPT
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 NH for costs incurred in three snowstorms that hit the State in 2005. The total aid for all three storms was \$6,892,0237 (January: \$3,658,114; February: \$1,121,727; March: \$2,113,182). Emergency Declaration EM-3207: Not declared in Coos County Emergency Declaration EM-3208: The total aid for the January storm in Coos County was \$11,6508 Emergency Declaration EM-3211: Not declared in Coos County On all occasions during the 2005 winter season, the Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 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. The Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 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 Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 HMPT
Severe Winter Weather (Snowstorm)	February 8, 2013	All Ten NH Counties	Major Disaster Declaration DR-4105: A severe winter storm resulted in heavy snow in February 2013 in all ten New Hampshire counties. (Nemo). The Public Works Department handled the heavy snow accumulation in Gorham.	FEMA, 2016 HMPT & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
E. Earthquakes: According to the NH State Hazard Mitigation Plan, New Hampshire is considered to lie in an area of "moderate" seismic activity compared to other areas of the United States. New Hampshire is bordered to the north and southwest by "major" activity areas. 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 Gorham since the prior hazard mitigation plan.				
A summary of earthquakes with a magnitude of 4.0 or greater in the State and nationwide				
Earthquakes	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)		Occurrences of earthquakes with a magnitude of 4.0 or greater in recorded New Hampshire History	State of NH Multi-Hazard Mitigation Plan, Update 2018
A detailed summary of earthquakes that were felt in the Community 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 & 2024 HMPT
Earthquake	December 24, 1940	Ossipee, NH	Magnitude 5.5	
Earthquake	June 15, 1973	Quebec Border / NH	Magnitude 4.8	
Earthquake	January 19, 1982	West of Laconia, NH	Magnitude 4.5	
Earthquake	November 20, 1988	Berlin, NH	Magnitude 4.0; felt in Gorham, but no reported damage besides glassware falling from shelves.	
Earthquake	April 6, 1989	Berlin, NH	Magnitude 4.1; felt in Gorham, but no reported damage	
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	
Earthquake	October 16, 2012	Hollis Center, ME	Magnitude 4.0	

Type of Event	Date of Event	Location	Description	Source
F. Drought: Drought is generally less damaging or disruptive than floods and other hazards and is more difficult to define. A drought is a natural hazard that evolves over months or even years and can last as long as several years to as short as a few months. 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. No significant droughts have occurred in Gorham since the 2020-2021 drought, which has decreased throughout most of NH but remains "Abnormally Dry" in areas just north of Gorham. (NH Drought Monitor, 11/4/21)				
A 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
A summary of drought in the Community since 1929				
Drought	1929-1936	Statewide	Regional	State of NH Multi-Hazard Mitigation Plan, Update 2018 & 2024 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	A declared drought for the summer of 2016 and 2017, moderating from extreme in southern New Hampshire to dry in the most northern communities. The drought affected Gorham, however, not significantly enough to require a water ban. Although rivers and ponds were lower than normal, the Town's available water resources for fire suppression remained functional. Most residents not on public water have artesian wells. There is no recollection of wells drying up.	
Drought	2020-2021	Statewide	A declared drought for 2020-2021, with NH's north country being impacted more than the southern communities. The drought affected Gorham, however, not significantly enough to require a water ban. Most residents not on public water have artesian wells. There is no recollection of wells drying up. Although rivers and ponds were lower than average, the Town's available water resources for fire suppression remained functional.	

Type of Event	Date of Event	Location	Description	Source
G. Miscellaneous Past or Potential Hazards: Natural, technological, and human-caused hazards and other unusual hazardous events have been noted throughout New Hampshire. Among others, one concern is transporting hazardous material through communities by rail and tractor-trailer. Other natural, technological, or human-caused hazards have the potential to impact the Community on a townwide basis. Covid-19 is ongoing in Gorham.				
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"). Recommended mitigation measures were and continue to be taken by the Community. The Town received funding from the State through the GOFERR program.	FEMA & 2024 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 as a result of the impact of COVID-19	FEMA & 2024 HMPT
Terrorism & Violence	2010	Gorham	Routine traffic stop revealed individual on the terrorism watch list; was held by Gorham Police until picked up by immigration.	2016 HMPT
Dam Failure	Dam Warning	The dam across from Shaw's	A low-hazard dam that is structurally sound but was leaking. The hydro operator began to lower the pond level when the National Weather Service issued a flood warning. The warning stated "imminent failure", although it was not severe. The Town used the opportunity to warn neighbors and used it as a training exercise to monitor and test emergency services.	2016 HMPT
Erosion (riverbank)	August 2011, October 2012 & Potential	Peabody & Moose Rivers	The Peabody and Moose rivers caused significant erosion damage during Tropical Storms Irene & Sandy. The bank of the Peabody across the river from White Birch Lane has been eroded and continues to pose a concern as it may erode to the point where it constricts the river's flow. The Moose River near Water Street has eroded to expose roots and rocks and threatens the Gateway Mobile Home Park. Loss of land continues to occur along the Peabody and Moose Rivers, particularly at Braeburn Village MHP and the end of Bellevue Place.	2016 HMPT & 2024 HMPT
Landslide & Aging Infrastructure	Potential	NH Route 16 above Libby Pool	A retaining wall on NH Route 16 above the Libby Pool is no longer secure; pieces are falling off the wall, and although it is on the DOT 10-year plan for repair, a potential failure is possible.	2024 HMPT
Mass Casualty Incidents	Past & Potential	Gorham	Since the last hazard mitigation plan, two car accidents were declared Mass Casualty Incidents (MCI) in Gorham. The Fire Department and EMS handled the incidents.	2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Terrorism & Violence	April 6, 2015	Gorham Town Common	A Gorham man was arrested for shooting and killing a 27-year-old man and attempted murder of another man. The shooter eventually pleaded guilty to second-degree murder and attempted murder and was sentenced to at least 35 years in prison.	2024 HMPT https://www.wmur.com/article/gorham-man-pleads-guilty-to-shooting-killing-former-roommate/5204214
Terrorism & Violence	October 9, 2013 - July 20, 2014	Gorham	A Gorham resident held, tortured, and raped a 14-year-old Conway teen in his mobile home for nine months before being arrested. The captor was arraigned on July 29, 2014, with more than 200 charges. He struck a plea deal in 2016 and is serving 40-90 years in prison. Gaining national attention, the hunt for the Conway teen ended on July 20, 2014, when she was released not far from her family's home.	2024 HMPT & https://www.concordmonitor.com/Abby-Hernandez-survivor-story-ABC-20008084
H. Other Hazards: Identified hazards with no specific example of an occurrence since the prior hazard mitigation plan.				
Natural Hazards		Although the Team did not identify specific examples or past occurrences of these hazards, it felt worthwhile to list them as potential hazards to the Town. These hazards can potentially impact areas of the Community or townwide. See <i>Table 3.1, Hazard Threat Analysis</i> , and Chapter 5 for more details on these hazards.		
Extreme Temperatures				
Lightning & Hail				
Technological Hazards				
Hazardous Materials				
Conflagration				
Known & Emerging Contaminants				
Human-caused				
Cyber Events				
Transport Accidents				

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

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

- 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>

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Chapter 4: Critical Infrastructure & Key Resources (CIKR)

Team discussion and brainstorming identified Critical Infrastructure & Key Resources (CIKR) within Gorham. The Hazard Risk rating was based on a scale of 1-3, with 1 indicating little or no risk.

TABLE 4.1 - EMERGENCY RESPONSE FACILITIES (ERF) & EVACUATION

Emergency Response Facilities (ERFs)			
ERFs are primary facilities and resources needed during an emergency response.			
Facility	Type of Facility	Hazard Risk	
Town Office Complex (generator)	Primary EOC, law enforcement, dispatch center & town administrative offices	All Hazards	1
Fire Station (portable generators on hand)	Fire, EMS & secondary EOC	All Hazards	1
Cascade Fire Station (portable generator on Engine)	Fire Personnel & equipment	All Hazards	1
Public Works Garage (portable generator)	Heavy equipment, sand, gravel, gas, diesel & secondary EOC	All Hazards	1
Ed Fenn Elementary School (generator)	Secondary shelter	All Hazards	1
Gorham Middle/High School (no generator)	Primary shelter	All Hazards	1
Gorham Ambulance	EMS	All Hazards	1
Pine Mountain repeater	Communications	All Hazards, Wildfires, Lightning & Hail, High Wind Events	2
NH DOT	Heavy equipment, sand, gravel, gas & diesel	All Hazards	1
Gorham Common	Heli-landing Zone	All Hazards	1
Gorham Airport	Heli-landing Zone	All Hazards	1
Androscoggin Valley Hospital (AVH)	Medical Facility	All Hazards	1
Evacuation Routes			
US Route 2	Primary evacuation route	All Hazards & Inland Flooding	3
NH Route 16	Primary evacuation route	All Hazards & Inland Flooding	3
Pinkham B Road (snowmobile only/winter)	Secondary evacuation route	All Hazards	1
Church St./Promenade St./Sandpit/Union St. or Dublin St.	Secondary evacuation route	All Hazards & Inland Flooding	2
Church St./Shady Lane/Schumacher Lane/Ed Fenn/Union St. (small vehicles only)	Secondary evacuation route	All Hazards & Inland Flooding	2
Multi-Modal Road	Secondary evacuation route	All Hazards & Inland Flooding	2
Bridges & Culverts on the Evacuation Routes			
Route 2 over Moose River (near Fire Station)	Bridge on evacuation route (state)	All Hazards & Inland Flooding	2
Route 2 over Peabody River	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Route 16 over Moose Brook	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1

Emergency Response Facilities (ERFs)			
ERFs are primary facilities and resources needed during an emergency response.			
Facility	Type of Facility	Hazard Risk	
Route 2 at the bottom of Gorham Hill adjacent to Moose River over railroad tracks	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Route 16 over Peabody River	Bridge on evacuation route (state)	All Hazards & Inland Flooding	2
Route 16 over Clay Brook	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Multi-Modal Route over Moose Brook	Bridge on evacuation route (town)	All Hazards & Inland Flooding	1
Pinkham B at Town Line Brook (in Randolph)	Bridge on evacuation route (state & Randolph)	All Hazards & Inland Flooding	1
Route 2 between Durand and Pinkham Road (Randolph)	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Jimtown Road Bridge over Moose Brook	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Cascade Street over St. Lawrence Railroad	Bridge on evacuation route (Gorham/Berlin)	All Hazards & Inland Flooding	1
Tinkerbrook (Cascade Flats)	Bridge on evacuation route (town)	All Hazards	1
Spring Road Culvert	Bridge on evacuation route (town)	All Hazards	1
Footbridge over Peabody River	Bridge on evacuation route (town)	All Hazards & Inland Flooding	1
Route 16/Androscoggin River Trestle	Bridge on evacuation route (NH Trails)	All Hazards & Inland Flooding	1
Rail Trail Canal Bridge	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Rail Trail Moose Brook Bridge	Bridge on evacuation route (state)	All Hazards & Inland Flooding	1
Dams/Owners			
Cascade Hydro Dam (Brookfield)	High Hazard	All Hazards	1
Cascade Wastewater Lagoon Dam (White Mt. Paper)	Significant Hazard	All Hazards	1
Icy Gulch Reservoir Dam (W & S)	Significant Hazard	All Hazards	1
Upper Gorham Hydro Dam (Brookfield)	Low Hazard	All Hazards	1
Lower Gorham Hydro Dam (Central Rivers Power)	Low Hazard	All Hazards	1
Peabody River Dam (Gorham/Libby Pool)	Non-menace	All Hazards	1
Moose Brook Dam at Moose Brook (NH DNCR)	Non-menace	All Hazards	1
Wildlife Pond Dam (Private)	Non-menace	All Hazards	1
Moose Brook Dam at Moose River (NH DNCR)	Non-menace	All Hazards	1
Gorham Dam Dike (Central Rivers Power)	Non-menace	All Hazards	1
Perkins Brook Dam (W & S)	Non-menace	All Hazards	1
The NH Dam Bureau lists 11 active and two removed dams. Of the active dams, one is high-hazard, two are significant hazard, two are low hazard, and six are non-menace. The two removed dams are not listed above.			

TABLE 4.2 – NON-EMERGENCY RESPONSE FACILITIES (NERF)

Non-Emergency Response Facilities (NERFs)			
NERFs are facilities that, although critical, are not necessary for immediate emergency response efforts. This would include facilities to protect public health and safety and to provide backup emergency facilities.			
Facility	Type of Facility	Hazard Risk	
Town Hall	Possible shelter	All Hazards	1
Congregational Church	Possible shelter	All Hazards	1
Holy Family Church	Possible shelter	All Hazards	1
The Quality Inn	Possible shelter	All Hazards	1
Town & Country (Shelburne)	Possible shelter	All Hazards	1
Wastewater Treatment Plant (8 Main Street)	Wastewater	All Hazards & Inland Flooding	2
Water Treatment Plant (Jimtown Road)	Water supply	All Hazards	1
Sewage Pumping Station (Tinker Brook on Cascade Flats)	Wastewater	All Hazards	1
Cascade/First Street Holding Tank	Water supply	All Hazards	1
Cascade Pumping Station (Lift Station)	Water supply	All Hazards	1
Sugar Hill Holding Tank	Water supply	All Hazards	1
Well at the end of the runway near the railroad and pipe yard	Water supply	All Hazards	1
Well #2 at the end of the airfield	Water supply	All Hazards	1
Perkins Brook Reservoir	Water supply	All Hazards	1
Icy Gulch Reservoir	Water supply	All Hazards	1
Gorham Hill Spring House (in Randolph)	Water supply	All Hazards	1
Consolidated Switching Station on Lancaster Road	Communications	All Hazards	1

TABLE 4.3 – FACILITIES & POPULATIONS TO PROTECT (FPP)

Facilities & People to Protect (FPPs)			
FPPs are facilities that need to be protected because they are essential to the Town and residents who may need help during a hazardous event.			
Facility	Type of Facility	Hazard Risk	
Horton Center (Pine Mountain)	Children's camp (summer)	All Hazards & Wildfire	2
Ed Fenn Elementary School	School & secondary shelter	All Hazards & Inland Flooding	2
Gorham Middle/High School	School & primary shelter	All Hazards	1
Birch Grove	Elderly housing	All Hazards	1
Promenade Court	Elderly & low-income housing	All Hazards	1
Braeburn Village	Mobile home park	All Hazards & Inland Flooding	3
Family Resource Center	Pre-school & SAU office	All Hazards	1
Mother Goose Daycare (Cascade Hill)	Childcare	All Hazards	1

Facilities & People to Protect (FPPs)			
FPPs are facilities that need to be protected because they are essential to the Town and residents who may need help during a hazardous event.			
Facility	Type of Facility	Hazard Risk	
Gateway	Mobile home park	All Hazards & Inland Flooding	3
Dublin Street	Mobile home park	All Hazards & Inland Flooding	2
Labonville's	Mobile home park	All Hazards & Inland Flooding	2
Paradise Park	Mobile home park	All Hazards	1
Historical Society Museum - Railroad Station	Historic	All Hazards	1
Town Hall	Primary EOC (PD) & historic (NH)	All Hazards	1
Gorham Public Library	Historic (NH)	All Hazards	1
Congregational Church & Parsonage	Possible shelter & historic (NH)	All Hazards	1
George Washington Noyes/McCready House	Historic (NH & national)	All Hazards	1
Moose Brook State Park Campground	Campground	All Hazards	1
Multiple hotels, motels, and B&Bs are located in Gorham. On busy weekends, these would also be considered FPPs.			
The functional needs population, including the elderly and disabled, who are living independently, would also be considered FPPs			

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. For Potential Resources, please refer to the 2021 Gorham Emergency Operations Plan.

Chapter 5: Hazard Effects in Gorham

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

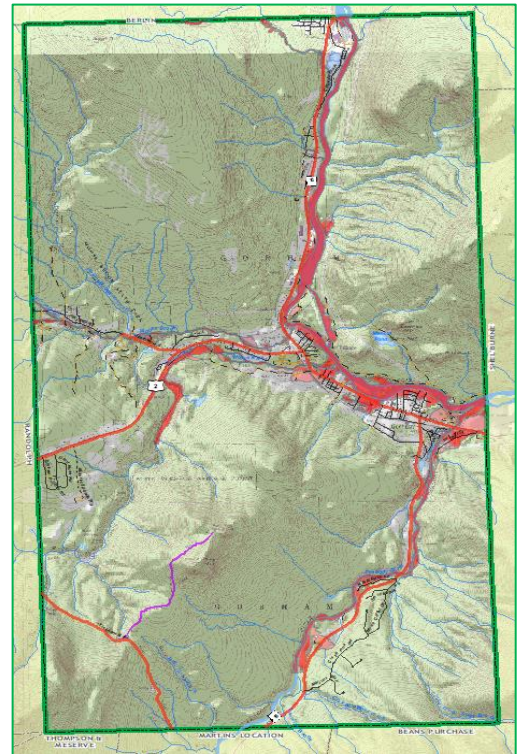
Identifying the Critical Infrastructure & Key Resources (CIKR) that are most likely to be damaged in inland flooding events is important, as inland flooding is the most significant hazard in New Hampshire. Identifying the CIKR with a wildfire risk is also important, as the Town is heavily forested.

Overall Flood Risk

Gorham's CIKR were identified and listed in Chapter 4; each CIKR was analyzed for its flooding potential. This analysis and the transparent red area in the GIS map snip to the right indicate the floodplain. Sixteen of Gorham's Emergency Support Facilities (ERFs) were found in the floodplain. Two are Non-Emergency Support Facilities (NERFs), the Ed Fenn School, and Well #1 at the end of the airport's runway. The remaining fourteen ERFs are dams and bridges, which are expected to be in the floodplain.

When working on Table 4.1, the Team indicated that other CIKR, in addition to the Ed Fenn School, may be in harm's way for flooding. These include the wastewater treatment plant, Braeburn Village, Gateway Mobile Home Park, Dublin Street Mobile Home Park, and Labonville's Mobile Home Park, which could be subject to inland flooding. These mobile home parks contain a collection of approximately 127 homes. Please refer to Chapter 4, Tables 4.1-4.4, and Inland Flooding in Section C of this chapter for more information.

It is expected that there are many other structures and homes within the flood zone. Considering all at-risk properties when a flood hazard is likely is vital.



Overall Wildfire Risk

CIKR falling within the Wildland Urban Interface (WUI) were reviewed using the same methodology as flooding. 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 on the following page shows the traditional WUI in Gorham. This area is where the urban environment interfaces with the wildland environment and is the most prone to wildfire risk.

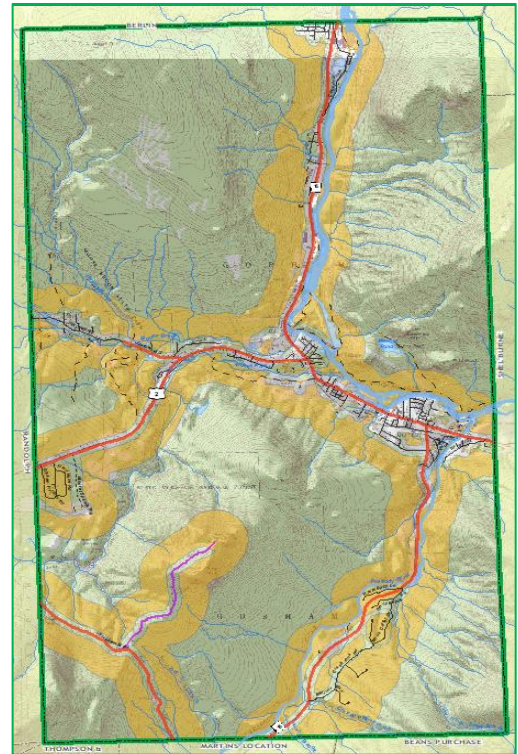
The traditional WUI was initially developed to identify human-interface areas that may exceed the typical length of fire hoses. In some communities, this would virtually cover the entire town. A different method to determine the WUI in suburban communities includes identifying developments, streets,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

The Ed Fenn Elementary School was determined to be in the WUI, along with the Pine Mountain Repeater, the sewerage pump station at Tinker Brook, the Horton Center, and Well #1 at the end of the runway. The remaining 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.

As seen in the map snip to the right, there are numerous dead-end streets in Gorham, some of which may have higher than average wildfire risk due to the distance between structures, the number of trees that line the streets, and of course, the lack of a second egress. The map includes Class VI private roads (orange/black lines).

Two facilities at high risk for wildfires from the GIS analysis were also identified in Tables 4.1-4.4. These are the Pine Mountain Repeater and the Horton Center. The Team felt that all other CIKRs had a reasonable amount of defensible space and were not at high risk for wildfires.

Many additional structures in Gorham are expected to be prone to wildfires, especially, as suggested above, in neighborhoods with limited egress and a canopy of trees or where forests completely surround structures. However, because Gorham 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 ascertain the dollar amount of damage caused by hazards because the damage will depend on the hazard's extent and severity, making each hazard event somewhat 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 the impact is localized.

MS-1 Assessed Value of All Structures 2022 Town Report			
Assessed Structure Value (2022-MS1)	Value	1% Damage	5% Damage
Residential Buildings	\$165,325,400	\$1,653,254	\$8,266,270
Manufactured Housing	\$11,018,200	\$110,182	\$550,910
Commercial Buildings	\$71,643,140	\$716,431	\$3,582,157
Tax Exempt Buildings	\$29,083,300	\$290,833	\$1,454,165
Utilities	\$73,113,600	\$731,136	\$3,655,680
Total	\$350,183,640	\$3,501,836	\$17,508,182

This plan assumes that the potential loss from the identified natural hazards would range from **\$0 to \$3,501,836** or **\$3,501,835 to \$17,508,182**, based on the 2022 MS1 total structure value of **\$350,183,640**. (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** on the Community of the hazards 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.

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

The “Hazard Identification & Risk Assessment (HIRA)” and the “Probability” noted for each hazard below are taken from the 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.

1) INLAND FLOODING

Hazard Identification & Risk Assessment (HIRA) High
 Probability High
 Estimated Structure Loss Value \$3,501,835 to \$17,508,182

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 heavy summer and fall rains. Local road flooding is often the result of rapid snowmelt and heavy spring or autumn rain events. Heavy rain from tropical downpours, hurricanes, severe thunderstorms, and rapid snowmelt often cause culverts to be overwhelmed and roads to wash out. Additionally, timber harvesting, if conducted improperly, undersized or aging culverts, and inadequate ditching are possible causes of local road flooding.

According to the latest digital flood insurance rate map (DFIRM), there is a substantial 100-year flood zone and a 50-year flood zone within Gorham. The floodplain areas are primarily along the Androscoggin, Peabody, and Moose Rivers; other small streams and brooks throughout town may also experience flooding.

Flooding along the Androscoggin River is concerning, but flooding results are often less severe than along the Peabody and Moose Rivers, as described below. Most of the areas along the banks of the Androscoggin River are in the 100-year floodplain; some are also in the 200-year floodplain. The Androscoggin is controlled by dams and dikes upstream, which help alleviate the probability of flooding. Still, heavy rains could inflict significant flood damage to homes along the river if the flood waters are not controlled effectively. Businesses and homes on Main Street and in the surrounding neighborhoods have flooded in the past. Flooding along Main Street in Gorham is also discussed below in Section D, 2) Dam Failure.

Three significant events have occurred in Gorham since the last hazard mitigation plan. These events will be discussed further in this section; however, we start our discussion with Tropical Storm Irene, the Peabody River, and Moose Brook. Tropical Storm Irene was a storm that the Community will never forget.

The Peabody River, which drops 5,000 feet in three miles, was the focus for much of the damage during Tropical Storm Irene in 2011. Due to flood waters, six homes on White Birch Lane were separated from emergency responders. The swift-moving water also washed out other roads and culverts and flooded the basements of 25 homes; some homes had water as high as the first floor, and one home was washed off its foundation. The affected streets included White Birch Lane and Stoney Brook; the Libby Pool was also impacted.

***The Peabody River** is said to be one of the most dangerous small rivers in the country and floods with tremendous velocity. As heavy rains fall on the high summits of the White Mountains (often receiving several inches more than the towns below), the rainwater funnels from the mountains into the Peabody River, where it rushes straight down and into the valley below before joining with the Androscoggin River. The topography of the Peabody River is such that there are no leaching spots and no vegetation to stop the flow; in addition, the base of the river is non-porous, comprised of rocks, stone, and granite. The high water recedes nearly as quickly as it comes.*

.....-Excerpt from the 2016 Hazard Mitigation Plan

The Moose River has many of the same characteristics as the Peabody River, only to a lesser degree. Like the Peabody, water rushes down the mountains and into the Moose River, which then meanders through part of downtown Gorham before reaching the Androscoggin River. The water here also recedes nearly as quickly as it comes. Tropical Storm Irene brought flooding and property damage to areas along the Moose River, including the Fire/EMS Station, the Gateway Mobile Home Park, Spring Road (Moose Brook), Water Street, and Broadway Avenue. Scouring of bridge abutments, riverbank erosion, and the Moose River's fast-flowing water washed out roads and threatened about 20 homes.

Tropical Storm Sandy in 2012 also impacted Gorham; the Peabody River rose but not as high as during Irene. Some homes on Bangor Street had damage, including mud deposits in basements. As a result of Tropical Storm Irene, one year earlier, some homes had already been evacuated on White Birch Lane.

More recently, two Major Disaster Declarations were declared in Coos County. The first in July 2017 (DR-4329) caused very little damage in Gorham; Spring Road and Stoney Brook required heavy equipment to remove debris. The second, in October 2017 (DR-4355), brought heavy winds and rain to Coos County. In Gorham, there was basement flooding in homes on Bangor Street. Moose Brook flooded and damaged Spring Road. During this event, the Town Hall sustained damage to the 3rd floor and the public meeting room, and the Libby Recreation Complex had \$19,000 worth of damage.

One additional storm occurred since the last plan. This isolated event occurred in July 2020 and was not declared a major disaster. During this event, four inches of rain fell in an hour, causing the raging Moose Brook to cause a privately owned culvert to fail, which in turn caused washouts on Jimtown Road and a berm on Moose Brook. Two other spots also had damage. See Table 3.2 for more information.

As discussed in Section D, 6), Aging Infrastructure, older roads, and aging culverts are an issue in Gorham, particularly in the Cascade Flats and Stoney Brook Area. The Team reported that roads, in general, need repair throughout the Community at an estimated cost of \$13,000,000. The Public Works Department cares for 19 miles of paved and one mile of gravel roads. The State maintains two main arteries, US Route 2 and NH Route 16. Significant rain, particularly with rapid snow melt, can cause considerable damage to Gorham's roads.

While staying within the annual budget, the Public Works Department improves and upgrades roadways according to the age of the current culvert, the anticipated length of usefulness, what issues are occurring at the location, and other stormwater concerns. Although the Public Works Department will continue to improve and upgrade roads and stormwater systems, only one culvert project is included in *Table 9.1, The Mitigation Action Plan*.

The expected loss value from inland flooding would be based on the cost of repairing 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.

2) SEVERE WINTER WEATHER

Hazard Identification & Risk Assessment (HIRA) High
Probability Moderate
Estimated Structure Loss Value \$3,501,835 to \$17,508,182

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 severity each year. Power outages, extreme cold, and impacts on infrastructure are all effects of past winter storms felt in Gorham. These impacts are a risk to the Community, including isolation, especially to the elderly (28.5%) 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.

One of the most recalled seasons for snowfall was the winter of 1968-69, a winter that broke total snow accumulation and single-day snowfall records in much of northern New Hampshire. The winter of 1968-69 brought back-to-back 3-foot snow storms to the Gorham area; the Town hired heavy construction equipment to keep Main Street open, and it was noted that in some areas, homes had snow up to their second levels. The Gorham Public Works Department handled the heavy accumulation of 1968-69 and has successfully dealt with every snowstorm since.

As shown in Table 3.2, other snowstorms and nor'easters have previously struck Gorham. The Town reports approximately four feet of annual snowfall. However, no snowstorms of significance have struck Gorham since the last hazard mitigation plan.

More recently, in March 2017 and March 2018, snowstorms with unusually high spring accumulation received Major Disaster Declarations (DR-4316 and DR-4371) for some NH counties but not Coos. Heavy snow fell throughout the State and Gorham on both occasions, but the Gorham Public Works Department kept roads and parking areas clear to allow the scheduled Town Meetings and Voting Days to occur.

Although Gorham's Public Works Department handles usual snow amounts without difficulty, Gorham's roads are often impacted by poor weather conditions. Travel can be difficult with heavy traffic, particularly on NH Route 16 and US Route 2, which are the State's responsibilities; poor road conditions may hinder fire and other emergency responses.

Ice Storms

Ice storms are more concerning than 2-4' snowstorms, though the probability of a significant ice storm is lower than a significant snowstorm. An ice storm can inflict several million dollars of damage on forests and structures. Unlike typical snowstorms, which are generally handled well by the Public Works Department, 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.

The 1998 Ice Storm inflicted damage throughout Gorham, causing ice on trees, downed power lines, closed roads, limited EMS access, and power outages for several hours. This storm particularly damaged the higher elevations; fallen trees and brush on the forest floor continue to be removed by the National Forest Service and remain fuel for wildfire. Fortunately, the 1979, 2008, and 2010 Ice Storms did not impact Gorham.

The communications tower and equipment at the summit of Pine Mountain are susceptible to damage in future snow and ice storms. During the winter months of 2004, the cell tower on Pine Mountain blew over, disrupting most of the Town's cell service. Ice, wind, and snow damage could disrupt communications to Gorham Dispatch, responsible for notification to Gorham, Randolph, and Shelburne's emergency responders.

Since the last hazard mitigation plan, no damaging or debilitating winter storm events have occurred in Gorham. 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.

3) HIGH WIND EVENTS

Hazard Identification & Risk Assessment (HIRA)	High
Probability	Moderate
Estimated Structure Loss Value	\$3,501,835 to \$17,508,182

Isolated High Wind Events

Due to the geographic location of Gorham and its location in the White Mountains of New Hampshire, isolated high winds and downdrafts are common occurrences, particularly along Main Street. Wind tends to swoop down the mountainsides, creating "wind tunnels" in other parts of the Town. High winds have brought down trees and power lines and have caused power failures and road closures. Gusts of over 30 mph are not uncommon in the Town of Gorham.

High-wind events are unpredictable. Winds of this magnitude could fall timber, thus blocking roadways, downing power lines, and impairing emergency response. These unexpected windstorms affect old-growth softwood, particularly in the spring when the water table is high.

Tornadoes & Downbursts (microbursts & macrobursts)

The most significant difference between tornadoes and downbursts, also known as microbursts and macrobursts, is the direction, 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.

Microbursts are becoming more frequent and often result in damage. 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. In Gorham, a microburst would be more likely than a tornado.

In 2010, Gorham reported that a tornado touched down on Brook Road; minor property and tree damage resulted. Gorham has experienced other minor downbursts that resulted in isolated property damage but no significant events. The Team felt that the frequency of downbursts seemed to be increasing as we experience climate change; however, there have been no microbursts or tornadoes since the previous hazard mitigation plan.

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, resulting 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 0% and 1% of the total structure value.

4) TROPICAL & POST-TROPICAL CYCLONES

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
Estimated Structure Loss Value	\$3,501,835 to \$17,508,182

Damaging winds due to tropical and post-tropical cyclones (hurricanes) are considered a medium risk, primarily because of Gorham's abundance of forested land. Significant forest damage could occur, like during the 1938 hurricane and hurricanes Carol and Edna in 1954. 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 should be considered potential hazards. In most cases, tropical cyclones have been downgraded to post-tropical cyclones when they reach northern New Hampshire.

Tropical Storms Irene and Sandy brought heavy rain and local flooding to Gorham. Substantial flooding, flash flooding, and water rescues resulted from both storms (addressed above under flooding).

As stated above, hurricanes, mainly those named Category storms, are rare, but the damage any Category-named hurricane could cause in Gorham could be significant. If a Category 1 or higher hurricane made it as far north as Gorham, the damages caused by associated heavy wind and rain would affect the entire town, perhaps at a higher magnitude than Tropical Storm Irene.

Since the prior hazard mitigation plan, no tropical or post-tropical cyclones have reached Gorham. 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.

5) INFECTIOUS DISEASES

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
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.”¹⁶

Infectious diseases and epidemics or pandemics present a possible threat to Gorham. Gorham is susceptible to an epidemic and subsequent quarantine with worldwide pandemics such as Covid-19, Lyme Disease, SARS, the Zika Virus, H1N1, the Avian Flu, and even the common seasonal flu virus. In fact, the United States and the world have been coping with the COVID-19 pandemic for nearly three 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.



As a tourist destination with snowmobilers, ATVers, and summer visitors to the White Mountains, Gorham is a bustling community during every season. The daily population in town can rise from approximately 2,700 to triple that amount during the summer months and double during winter. Several facilities in Gorham hold events and activities that could increase the likelihood of spreading infectious diseases. The Medallion Opera House, a 55+ apartment building in town, the local schools, the Library, the Town Hall, and multiple restaurants, inns, and motels are just some places where human interaction can increase the likelihood of disease. Churches, meeting houses, and social facilities also invite infectious disease outbreaks. Gorham's schools host students in all grades from Shelburne and Randolph as part of SAU 20. Interactions between students and out-of-town sports teams and clubs can also bring infectious diseases.

With assistance from public health networks, town officials did their best to mitigate the onset of Covid-19 in Gorham. Gorham applied for assistance through state and federal programs and worked with the State of New Hampshire Governor's Office for Emergency Relief and Recovery (GOFERR) for relief assistance. To help mitigate the crisis, the Town Hall initially closed but shortly reopened with mitigation measures in place; the schools also initially closed but reopened in the fall. The Town and SAU20 continue encouraging social distancing and protecting the Town's most vulnerable citizens.

¹⁶ Infectious diseases, Overview, <https://www.mayoclinic.org/diseases-conditions/infectious-diseases/symptoms-causes/syc-20351173>

As of February 9, 2023, 374,983 Covid-19 cases, 2,962 deaths, and 883 new cases were reported in New Hampshire (see the chart on the right).¹⁷ Deaths by town are no longer available, but it was reported that there were 686 cumulative cases in Gorham, 8,297 cumulative cases in the county, and 134 cumulative deaths in Coos County.¹⁸

COVID-19 Summary Report

(data updated as of February 9, 2023, 9:00 AM)

NH Total Case Count	374,983
New Cases for the Previous Week	883
Deaths Attributed to COVID-19	2,962
Total Current COVID-19 Cases	1,153
Current Hospitalizations Treated for COVID-19	32

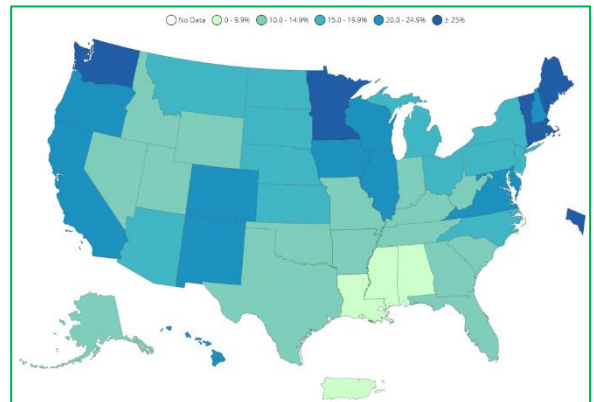
On February 10, 2023, the Center for Disease Control (CDC) reported 1,110,364 Covid deaths in the United States since the pandemic began.¹⁹

Covid-19, specifically the Omicron BA.5 and its variants, has raised concerns in New Hampshire, the United States, and the world. The virus has consistently changed since early 2020, and in late 2022, it seemed the deadly Delta was behind us, and the fast-spreading Omicron variants and subvariants seemed to be here to stay. Testing and vaccines are helping to keep severe illness to a minimum; vaccines are available for all persons, including young children and toddlers. Although vaccination rates continue to climb slowly, 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 reported on February 8, 2023, that 81.7% of the US population had received at least one vaccine dose, 69.2% had completed the primary vaccine series, and 15.8% had received the updated (bivalent) booster dose.²⁰

The CDC recommends that adults, particularly those who are medically compromised or over 65, receive two doses, two boosters, and a recently introduced vaccine that includes protection from the Omicron BA.5 variant and subvariants. Recommendations for children are slightly different.

The map to the right from the CDC shows the percentage of the population five years or older with an Updated (Bivalent) Booster Dose.²¹ The darker the color, the more vaccines have been administered.



Gorham's emergency service personnel plan extensively to prepare for and respond to infectious diseases. The Team felt that an epidemic or pandemic, like Covid-19, would continue to threaten the Community's citizens. However, the structure loss value was not estimated because there would be no direct impact on the Town's structures.

¹⁷ <https://www.covid19.nh.gov/>

¹⁸ <https://www.covid19.nh.gov/dashboard/map>

¹⁹ <https://covid.cdc.gov/covid-data-tracker/#data-tracker-home>

²⁰ https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-second-booster-pop65

²¹ total doses administered reported to the CDC by State/Territory and for the Select Federal Entities per 100,000 of the total population; https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-booster-percent-pop5

6) LANDSLIDE & EROSION

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
Estimated Structure Loss Value	\$0 to \$3,501,836

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 local 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.

Heavy stream flooding often causes culverts to be overwhelmed and roads to wash out. Lack of planning, improper road design, and undersized culverts increase erosion risk along Gorham's roadways. Refer to Inland Flooding in this chapter for more information on road erosion.

Riverbank erosion continues on all three of Gorham's major rivers: the Androscoggin, the Peabody, and the Moose. During Tropical Storm Irene, the Peabody River experienced significant erosion despite prior efforts to mitigate the problems. Heavy rains from the summits of the White Mountains funnel into the Peabody River at a tremendous velocity, causing riverbank erosion along the way. The most critical area is the bend in the river near White Birch Lane, where the road washed out, and six homes received flood waters during Tropical Storm Irene.

The Moose River has eroded near the Gateway Trailer Park at Water Street; erosion of the riverbank on the Moose River has undermined culverts and bridges along its course. The Androscoggin River has also experienced riverbank erosion in several locations, including the golf course at the Androscoggin Valley Country Club and Cascade Flats. Another concern is the retaining wall on NH Route 16 above the Libby Pool. The State has been lobbied to improve the situation, and it is now scheduled for repairs on its 10-year plan.

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.

7) EXTREME TEMPERATURES

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	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. Many New Hampshire residents have also 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.

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 Gorham is 28.5%, and the estimated poverty rate is 3.2% of the total population²². No deaths or illnesses due to cold or heat have been reported in Gorham since the prior hazard mitigation plan.

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, or 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. The Town provides warnings and recommendations regarding extreme temperatures on the emergency webpage and other social media. It has designated the Ed Fenn Elementary School and the Town Hall as cooling or warming centers.

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

8) WILDFIRES

Hazard Identification & Risk Assessment (HIRA)	Medium
Probability	Moderate
Estimated Structure Loss Value	\$3,501,835 to \$17,508,182

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 Wildland Urban Interface (WUI) discussion. The WUI can be determined in various ways; however, it represents the area where 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 Gorham.

Some fires are felt to be "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 However, with climate change, drought no longer has a low probability in New Hampshire, and more fires are likely to be surface fires. Burn permits are required in Gorham, as they are throughout the State, but often, burning occurs without the proper permits. Sometimes, it's difficult for the fire departments to monitor all conditions, and the occasional unauthorized burn will occur.

²² US Census Bureau, American Community Survey, ACS, 2015-2019

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

Due to the abundance of slash on the forest floor left by past ice storms and blowdowns and the mixture of hardwood and softwood trees throughout the Community, there is potential for fast-burning fuels, and a wildfire could potentially occur. Also, outdoor enthusiasts' recreational use of trails creates additional risks.

Since the last hazard mitigation plan, three small wildfires occurred in Gorham, one behind the mill in Cascade, one off Main Street, and one above Libby's. Two were ½ acre, while the one off Main Street was a three-acre fire. Two were human-caused, and the third, again off Main Street, was caused by sparks during work on the train tracks.

To help mitigate the effects of wildfire, the Gorham 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. The 2021 Annual Report for the Gorham Fire Department reports four "forest, woods or wildland fire, grass fire(s)" out of 252 calls for service in 2021.²⁴

Significant wildfires in New Hampshire are uncommon; five large fires have occurred in the State recently. These include the Bemis Fire in Crawford Notch (not included in Table 3.2), 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 Gorham Fire Department was not called to assist in these recent large fires.



**Wildfire in Shelburne responded to by the
Gorham Fire Department
Photo Credit: Gorham Fire Department**

Given the right conditions - drought, lightning, human interface - the potential for a significant wildfire is high. 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.

9) DROUGHT

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

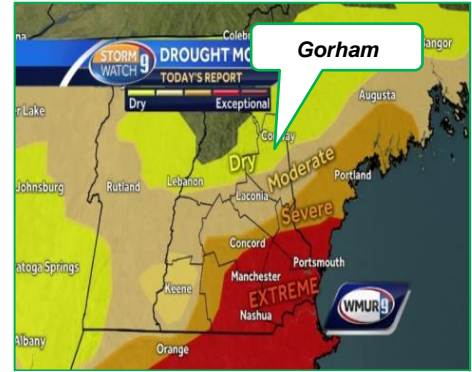
An extended period without precipitation or drought could elevate the risk of wildfire and blow-downs in the Community's forested areas. With an extreme drought, the water supply and aquifer levels could be threatened. According to the NH Department of Environmental Services (DES), drought is not rare in New Hampshire. DES states, *"In actuality, New Hampshire experiences drought quite frequently. For example, between the years 2000 and 2020, drought conditions occurred within 11 of those 20 years."*²⁵ A concern is that more frequent and longer-lasting droughts will occur with climate change. Only four significant droughts occurred before 2000, while three have occurred in just the past six years (2016, 2020, and 2022). In addition, drought conditions contributed to damage to the local forests and increased the risk of wildfire.

²⁴ Gorham 2021 Annual Report, Gorham Fire Department, page 46

²⁵ <https://www.des.nh.gov/climate-and-sustainability/storms-and-emergencies/drought#:~:text=In%20actuality%2C%20New%20Hampshire%20experiences,11%20of%20those%2020%20years.>

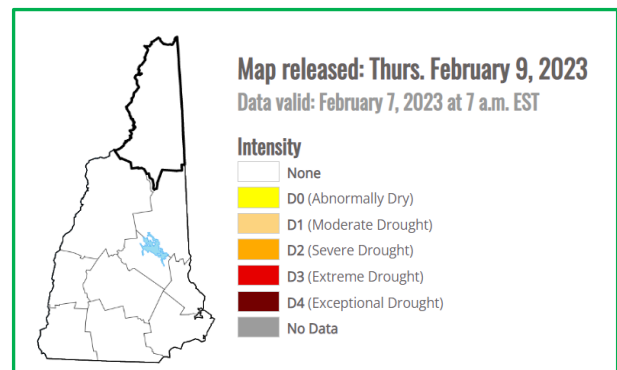
The 2016-2017 drought brought extreme drought conditions in the south and dry or no drought conditions in the north²⁶; Gorham had dry conditions during most of the 2016 drought (see the yellow section on the map to the right). There were reports of the loss of a few wells, but since most of the Community is on public water, this was minimal. Water for fire suppression was not impacted.

The 2020-2021 drought was less significant than the 2016 drought in southern NH but more significant in northern NH. No water bans were enacted, there were no reported losses of wells, and once again, water resources for fire suppression held up.



WMUR Archives; September 15, 2016

A third drought was experienced state-wide during the summer of 2022. This drought was more severe in southern New Hampshire; northern communities like Gorham stayed “dry”. This drought had ended by early 2023 after fall rains and early snow. As of February 7, 2023, there was no drought in the State.²⁷ The bold black line shows Coos County.



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.

10) LIGHTNING & HAIL

Hazard Identification & Risk Assessment (HIRA)	Low
Probability	Very Low
Estimated Structure Loss Value	\$0 to \$3,501,836

Lightning

Lightning strikes have occurred in Gorham 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 outbuildings 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. No damaging lightning has occurred since the last hazard mitigation plan.

It was noted that severe thunder and lightning storms have been happening more often in recent years, perhaps due to climate change. Also concerning are the heavy rains that thunderstorms can produce and the subsequent erosion of ditches and roadways.

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

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

Hail

Although not common in Gorham, hailstorm events resulting from significant thunder and lightning storms can occur anytime. Summer storms may produce hail large enough to damage roofs, siding, and automobiles. Damage from hail could also result in failed crops, thus impacting the local economy and individual citizens. However, it is noted that Gorham 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 hail events have occurred in Gorham.

Based on the localized nature of lightning strikes and the minimal damage expected from hail, the potential loss value was determined to be between 0% and 1% of the total assessed structure value.

11) EARTHQUAKES

Hazard Identification & Risk Assessment (HIRA) Low
 Probability Very Low
 Estimated Structure Loss Value \$3,501,835 to \$17,508,182

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 in 1982 (4.0); two occurred in Berlin, one in 1988 (4.0), and another in 1989 (4.1).

Earthquakes with small magnitudes often occur in New Hampshire; most of the time, these are not felt, and there is no damage, although plates on shelves may shake on rare occasions. Many New Hampshire residents felt the 4.0 earthquake in October 2012, with its epicenter in Hollis Center, ME. The Team noted that the Hollis earthquake was not felt in Gorham.

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



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

1) LONG-TERM UTILITY OUTAGE

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Low

Although rare, long-term utility outages of five or more days have occurred in Gorham due to local line damage from high winds, severe storms, and problems with the power grid. A significant or extended power outage lasting more than a week could result in hardship for individual residents, particularly the elderly (28%), 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.

Long-term utility outage is still a concern, particularly when combined with the above natural hazards. Fortunately, it is noted that most services are located in town, but driving during severe weather events to obtain necessities can still be difficult due to poor road conditions. The Team felt that many residents are self-sufficient and are now equipped with generators and woodstoves.

As a relatively small, close-knit community, town officials know persons who may need help in emergencies. Nonetheless, a long-term utility outage would have a significant impact.

2) DAM FAILURE

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Low

Eleven active dams are listed by the Department of Environmental Services (DES) in Gorham. One dam, the Cascade Hydro Dam, is a high-hazard dam. Two dams, the Cascade Wastewater Lagoon Dam and the Icy Gulch Reservoir Dam, are significant-hazard dams. All other active dams in Gorham are either low-hazard or non-menace.

Failure of the Cascade Hydro Dam on the Androscoggin River, the only high-hazard dam in Gorham, would likely necessitate the evacuation of Cascade Flats. It would result in 500-year flood conditions in Cascade Flats and at least 100-year flood conditions along Main Street in downtown Gorham. Cascade Dam has a failure siren that can be heard in Cascade Flats; however, residents would only have minutes to evacuate. The Fire Department is aware and informed about DES reports, dam insufficiencies, and issues confronting the dam by Brookfield Power, the dam's owners. The Fire Chief has a copy of the Emergency Action Plan for the Cascade Hydro Dam.

It was noted that there are no dams on the Peabody or Moose Rivers. The Cascade Hydro Dam and the other two dams on the Androscoggin River are well-regulated and have sound notification systems. Other small low-hazard dams pose little or no risk. See Table 4.1 for more information on dams.

Another dam to consider is the Azischohos Dam upstream on the Androscoggin River in Maine. Failure of the Azischohos Dam could have the potential to devastate downtown Gorham. Inundation plans indicate that it would take approximately twelve hours before the flood water of the Androscoggin would reach Gorham so that people could be

evacuated; structures along Main Street and the surrounding neighborhoods, however, would be in harm's way. The Fire Department also has a copy of the Aziscohos Dam plan.

3) HAZARDOUS MATERIALS

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Low

Hazardous material in fixed locations is a concern in many New Hampshire communities and Gorham. 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, water supply, and the air we breathe.

Gorham has several areas noted as susceptible to damage from a fixed hazardous material event. There are seven Tier II properties, including the Central Rivers Power-Gorham Hydroelectric Facility, Wildcat Ski Area, Coleman Concrete, Walmart, Eversource, Berlin City Ford, and Royalty Inn. There are also several fuel storage depots in town.

The Gorham Wastewater Treatment Plan is located in the floodplain; a breach at the Cascade Water Treatment Plant could endanger residents below the plant. In addition, the Portland Pipeline (now empty) and a natural gas line travel through Gorham. These locations are closely monitored, and issues are mitigated when necessary. Residents on private property may also store hazardous materials; to help its residents, the Town participates in collecting household waste, such as paint.

The Team did not report any hazardous materials leaks, spills, or explosions since the previous hazard mitigation plan. However, If hazardous materials ignited, 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.

4) CONFLAGRATION

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Low

"Conflagration is an uncontrolled burning that threatens human life, health, property or ecology. A conflagration can be accidentally or intentionally created".²⁸

Gorham's Main Street and the Town Hall block are the most concerning areas of Gorham for conflagration. Buildings in this area are old buildings, mostly wooden structures, built close to one another. Also, the risk of a sizeable uncontrolled fire threatens the entire town because of its proximity to forested land and the developments and neighborhoods created in the Wildland Urban Interface (WUI).

When combined with high winds, a sizeable uncontrolled fire could spread from building to building across downtown Gorham. Fire could easily begin as a wildfire and quickly escalate to a conflagration. Alternatively, a conflagration could ignite a major wildfire. The amount of damage from any fire depends on many factors; the location of the fire and emergency accessibility are just two of those factors.

²⁸ Fire Definitions; HotAsBlazes.com

A conflagration could result in explosions, affect the transportation infrastructure, hamper communication and power systems, and shut down the numerous businesses along Gorham's Main Street. The impact on communication, power, and transportation would likely be temporary, but damage to homes and businesses could be significant.

5) KNOWN & EMERGING CONTAMINANTS

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Moderate

Known contaminants in drinking water occur naturally or when introduced by humans. Damage to the environment, the local flora and fauna, a reduction in land values, restrictions on public water sources, and an increase in short and long-term health issues are just some of the impacts of contaminants. There may also be a need for more robust water treatment equipment. However, emerging contaminants have not been historically monitored due to either a lack of laboratory capabilities or an understanding of the risk posed to human health.²⁹

Naturally occurring contaminants could include trace elements such as arsenic, lead, manganese, and uranium. The most concerning of these to private well water is arsenic; arsenic is naturally occurring and common in groundwater. The NH State Multi-hazard Mitigation Plan states that *"...health studies of New Hampshire residents have demonstrated the connection between arsenic and the increased prevalence of conditions such as bladder and other cancers and developmental effects on children."*³⁰

Hazardous material spills and other accidental introductions of chemicals into the ground and surface water can affect the safety of public and private water supplies. Human-made contaminants generally include pesticides and metals impacting groundwater or surface water. Emerging contaminants, such as poly or perfluoroalkyl substances (PFAs), have also been found in ground and surface water in New Hampshire; additional emerging contaminants, such as Methyl Tertiary Butyl Ether (MtBE), have also been found. Increased public awareness and testing of PFAs and MtBEs help counteract emerging contaminants' effects.

It is well-known that radon is common in Gorham; public education for radon testing is included in Action Item #11. Gorham's residents rely on the public water system, which is monitored, tested, and maintained using best practices. There have been no issues with Gorham's water in recent years and none since the completion of the last hazard mitigation plan.

6) AGING INFRASTRUCTURE

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

*"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."*³¹

²⁹ NH Multi-hazard Mitigation Plan-2018

³⁰ Ibid

³¹ <https://www.infrastructurereportcard.org/wp-content/uploads/2016/10/2017-NH-Report-Card-hq-with-cover.pdf>

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.³² The American Society of Civil Engineers gave NH an overall C- in its 2017 report card.³³

Aging infrastructure is a concern in Gorham as it is throughout New Hampshire and the United States. In Gorham, older roads and aging culverts are part of the Town's aging infrastructure, particularly in the Cascade Flats and Stoney Brook Area. The Team reported that roads, in general, need repair throughout the Community at an estimated cost of \$13,000,000. Staying within the annual budget, the Public Works Department replaces culverts, repairs ditches, upgrades stormwater systems, raises roadways, and paves based on priority, planning objectives, and climate change. Some sidewalks along Main Street and Lancaster Road also need improvement. Fortunately, there are no red-listed bridges in the Community.

Although the Public Works Department will continue to improve and upgrade roads and stormwater systems, only one culvert project is included in *Table 9.1, The Mitigation Action Plan*.

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

1) CYBER EVENTS

Hazard Identification & Risk Assessment (HIRA) High
Probability High

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.”*³⁴

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 Gorham 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”. Security on computer networks, off-site backup, and user education are vital to protecting sensitive town information and data.

³² NH Multi-hazard Mitigation Plan, 2018, page 156

³³ Ibid

³⁴ PDD-41; <https://obamawhitehouse.archives.gov/the-press-office/2016/07/26/presidential-policy-directive-united-states-cyber-incident>

2) TRANSPORT ACCIDENTS

Hazard Identification & Risk Assessment (HIRA) Medium
Probability Moderate

The possibility of vehicular accidents involving hazardous materials is identified as moderately significant in Gorham. The Town's major roads, NH Route 16 and US Route 2 are known to be used by vehicles carrying hazardous materials. These highways are common delivery routes for truck traffic between western NH and Vermont via Route 2 and Berlin and Conway via Route 16. These roadways traverse the Gorham area, traveling as together as Main Street in downtown Gorham through terrain with little or no population and, at other times, through densely populated areas.

Many of Gorham'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 Gorham are susceptible to hazards such as road flooding and high winds leading to downed trees in the roadways and potentially hazardous materials spills.

In addition, a train travels through Gorham carrying freight, propane, and other petroleum products and chemicals. There have been no issues with the train, but the potential is always present.

Losses could be relatively high in property and structural damage in a hazardous materials transportation incident, depending on the scope and location of the incident. However, the losses are expected to be localized and unlikely in densely populated areas, where the speed limit is reduced.

3) 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"*³⁵. 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.

An MCI could happen anywhere in Gorham, but more likely on NH Route 16 and US Route 2. These roads are heavily traveled year-round but are particularly dangerous during winter storms. Animal crossings and poor weather can set up the conditions for an MCI. In addition, with students traveling to Gorham from Shelburne and Randolph to attend school, the potential for an MCI is increased. Athletic teams are also at risk, traveling from one community to another within their sports districts. Two MCIs were reported since the last hazard mitigation plan; the Fire Department and EMS handled both incidents.

³⁵ DeValle Institute Learning Center; <https://delvalle.bphc.org/mod/wiki/view.php?pageid=89>

4) TERRORISM & VIOLENCE

Hazard Identification & Risk Assessment (HIRA) Low
Probability Low

Terrorism is feared throughout our country and the world; the disruption at soft targets is often the result of terrorist incidents. *“Soft Targets and Crowded Places (ST-CPs) are locations that are easily accessible to large numbers of people and that have limited security or protective measures in place making them vulnerable to attack.”*³⁶

As a tourist destination with snowmobilers, ATVers, and summer visitors to the White Mountains, Gorham is a busy mountain town all year. Gorham has many soft targets, including, but not limited to, the Medallion Opera House, the local schools, the Library, the Town Hall, and multiple restaurants, inns, and motels. With easy access to and from Canada via Gorham’s major highway, NH Route 16, the Town could also be a stopping point for would-be terrorists.

Highways could also be targets - any closure of US Route 2 or NH Route 16 in Gorham would cause state-wide disruptions in the transportation system. Disruption of these significant routes could affect Gorham’s businesses and the local economy.

Terrorism/violence has struck Gorham in the past, but no significant event has occurred since the last hazard mitigation plan (see Table 3.2). As with many small towns, the terrorism threat is minimal; if a terrorist incident were to occur, it would most likely be a homegrown terrorist event.

³⁶ https://www.cisa.gov/sites/default/files/publications/DHS-Soft-Target-Crowded-Place-Security-Plan-Overview-052018-508_0.pdf

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 was already being done to protect its citizens and structures. Once identified, the Team addressed each 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 were already 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 following table, *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.

Inadequate..... The existing program does not work as intended or does not 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
Tree Removal Program	Tree Removal Program to reduce damage from fallen trees and limbs to power lines, stormwater ditches, and structures and to reduce the wildfire risk.	Public Works Department	Good	Improvements Needed: As trees become damaged and threaten power lines and structures on town roads, the Public Works Department and Eversource remove them; Eversource is responsible for repairing power lines. The NH DOT and Eversource do this for state roads as needed. This strategy was deferred to continue local tree and brush removal efforts to help mitigate the effects of high wind events, ice storms, wildfires, and other natural hazards. Action Item #1 (also in Table 7.1)
Capital Improvement Program (CIP)	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.	Town Manager	Inadequate (working on developing a townwide plan)	Improvements Needed: Although a Capital Improvement Committee has been established, no Capital Improvement Plan (CIP) covers all town departments; each department has its own CIP. This strategy was deferred to continue developing a town-wide CIP and incorporate items from this Plan into a new CIP. Action Item #23 (also in Table 7.1)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
National Flood Insurance Program (NFIP) & Floodplain Ordinance (part of Zoning Ordinance)	The National Flood Insurance Program (NFIP) addresses both the need for flood insurance and the need to lessen the devastating consequences of flooding. The goals of the NFIP are to protect communities from potential flood damage through floodplain management and to provide people with flood insurance. A community's floodplain ordinance regulates all new and substantially improved structures located in the 100-year floodplain, as identified on the FEMA Flood Maps, which in Gorham are dated February 20, 2013.	Town Manager, Select Board & Planning Board	Good	Improvements Needed: The Town developed a flood ordinance and became a National Flood Insurance Program (NFIP) member on April 1, 1981. The Town's Flood Ordinance works well to successfully prohibit or force compliance to the ordinance for building and substantial improvements to structures within the FEMA flood zone. This strategy was deferred to this Plan to continue compliance with the NFIP, to obtain NFIP brochures to have available at the Town Hall, and to provide public outreach regarding the benefits of membership in the NFIP, whether properties are in the FEMA floodplain. This strategy was also deferred to provide robust information on flood mitigation techniques that can be taken to protect individual homes and properties using the Town's website or social media pages. Provide links to the NFIP, Ready.gov, and other pertinent websites. Action Item #14 (also in Table 7.1)
Master Plan (2020)	A Master Plan includes goals, objectives, and expectations for the future development of the Town.	Planning Board	Good	Improvements Needed: The Gorham Master Plan was last updated in 2020 and will not be ready for a state-recommended 10-year complete update until 2030. This strategy was deferred to annually review the Master Plan and consider including a natural hazards section, a discussion on climate change, and mitigation action items from this hazard mitigation plan in all future updates. Action Item #17
Culvert & Stormwater Maintenance Plan	A Culvert & Stormwater Maintenance Plan includes an inventory of all culverts and ditches in the Community, along with a record of location, size, etc. The Gorham PWD and the NH DOT clean the drainage basins once a year and after major flooding events. Culverts are repaired as needed.	Public Works Department	Inadequate (not completed)	Improvements Needed: The Gorham Public Works Department has a written Culvert & Stormwater Maintenance Plan. It was developed to ensure continuity of actions and efficient stormwater management. This strategy was deferred to continue improving the Culvert & Stormwater Maintenance Plan by adding additional details such as the size, material, date of installation, a recommended date for improvement, GPS location, and any problems associated with the location (i.e., flooding). Action Item #5 (also in Table 7.1)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Emergency Operation Plan (2021)	An Emergency Operations Plan identifies the response procedures and capabilities of the Town of Gorham in the event of a natural, technological, or human-caused hazard.	Emergency Management Director	Excellent	Improvements Needed or No Improvements Needed: The Gorham Emergency Operations Plan (EOP) was last updated in 2021 and is recommended for an update in 2026, based on the State's 5-year recommendation. The new EOP should include an EOC Call Alert List, a detailed Resource Inventory List, and Player Packets. It should also address the 18 ESFs in the NH State Emergency Operations Plan. This strategy was deferred to this Plan to update the EOP. Action Item #34 (also in Table 7.1) (Emergency Preparedness)
Hazardous Materials Response Team	A Hazardous Materials Response Team is a specialized team of individuals with the skill and expertise to manage HazMat-related incidents successfully. Most local fire departments are trained to offer a "defensive position" until HazMat experts arrive.	Fire Department	Good	Improvements Needed: Although Gorham does not have a HazMat Team, firefighters are trained in the basic response to HazMat incidents and are adept at maintaining perimeters until specialized teams arrive. The Gorham Fire Chief would likely call dispatch, who would then contact the State to request an available HazMat Response Team. Although this is preparedness, this was deferred to this Plan to continue HazMat training for the members of the Gorham Fire Department. Action Item #9 (Emergency Preparedness)
Subdivision Regulations (2021) Zoning Regulations (2021) Site Plan Review (2021)	Planning mechanisms such as subdivision, zoning, and site plan review regulations provide for the Town's orderly present and future development by promoting the public health, safety, convenience, and welfare of the Town's residents.	Planning Board	Good	Improvements Needed: The Gorham Subdivision and Zoning Regulations and the Site Plan Review process were reviewed and updated in 2021; the Town's planning mechanisms are in good shape. This strategy was deferred to review the Town's regulations and the site plan review process upon approval of this Plan to consider changes that could mitigate the occurrence and impact of natural hazards. Action Item #26
Fire & Police Department Training	Training for all police, fire, and EMS personnel, including wildfire suppression.	Fire Chief, EMS, Police Chief, Emergency Management Director	Good	Improvements Needed: Training of emergency responders is coordinated by the Emergency Management Director, the Fire Chief, and the Police Chief as needed and required. Training includes the many aspects of emergency response, including, but not limited to, medical, conflagration, wildfire, mass casualty, active shooter, and terrorism. This strategy was deferred for continued training. Action Item #10 (Emergency Preparedness)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Gorham Hazard Mitigation Plan (2016)	A hazard mitigation plan is designed to address natural, technological, and human-caused hazards and to understand the risks 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 effects of hazards.	Emergency Management Director	Excellent	Improvements Needed: The Gorham Hazard Mitigation Plan Update 2016 is being updated with this Plan. This strategy was deferred to review this Plan, the Gorham Hazard Mitigation Plan 2023, on an annual basis and to update the Plan again in 2028. Action Item #21
Pressurized, Dry Hydrants & other Water Resources	Gorham Fire and Water Departments maintain the Town's pressurized and dry hydrants. There are approximately 146 pressurized hydrants, four dry hydrants in the Community, and multiple locations for water drafting.	Gorham Fire Department & Water & Sewer Department	Excellent	Improvements Needed: Pressurized hydrants, dry hydrants, and drafting sites throughout Gorham provide water resources for firefighting. This strategy was deferred to maintain the pressurized hydrants, dry hydrants, and other water resources in the Community to help mitigate the effects of structure fires and wildfires. Action Item #4
CodeRED	CodeRED is a reverse calling warning system that uses listed phone numbers. CodeRED does not include cell and unlisted numbers or email addresses. The Gorham School District uses the "One Call Now" reverse calling system for school activities and emergency notifications.	Emergency Management Director, Police Chief & Town Manager	Good	Improvements Needed: CodeRED (vendor for the NH Emergency Notification System) is an excellent warning system but only stores hard-line resident phone numbers. The Town has provided information to residents about CodeRED. This strategy was deferred to continue to provide public outreach to encourage all residents to contact CodeRED to add cell numbers, emails, and unlisted numbers and to verify their information. Use the website, a possible brochure at the Town Office, social media platforms, or a sign-up at Town Meeting. Action Item #13
Source Water Protection Plan (2016)	Identifies vulnerabilities in source water areas	Water & Sewer Department	Excellent	Improvements Needed: The 2016 Source Water Protection Plan is in place and does what it is intended to do. However, the plan should be reviewed and updated since the Town acquired the 2,000-acre Tinker Brook Parcel. This strategy was deferred to review the Source Water Protection Plan and update it accordingly. Action Item #28

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
School Emergency Operations Plan (SEOP)	A School Emergency Operations Plan guides response to emergencies at the school.	SAU20, Police, Fire & Emergency Management Director	Good	No Improvements Needed: SAU 20 and the Gorham-Randolph-Shelburne School District complete school Emergency Operations Plans annually according to state requirements. The Gorham Middle/High School and the Edward Fenn Elementary School have plans that will be updated according to the State's requirements. Drills and exercises are done annually and include the participation of the Town's emergency responders. No improvements are needed at this time. (Emergency Preparedness)
Wellhead Protection Program	The purpose of a wellhead protection plan is to prevent the contamination of groundwater used for drinking water. The area is the surface and subsurface area surrounding the public water supply where contaminants are likely to reach.	Water & Sewer Department	Good	No Improvements Needed: The Gorham Water & Sewer Department has identified a wellhead protection area. As suggested by the State, the Town reviews the wellhead protection plan to comply with state regulations and better protect the public water supply. The Gorham Water & Sewer Department has and continues to address DES's concerns; wellhead protection at the Town's wells is excellent.
Bridge Maintenance Program	There are currently no red-listed bridges in the Community. Inspection and clean-up of bridges occur annually. The State inspects all bridges every other year and maintains state bridges regularly.	Public Works Department	Good	No Improvements Needed: The Gorham Public Works Department has established a short- and long-term bridge maintenance and replacement schedule. Currently, there are no "red-listed" bridges in town.
Technical Review Committee	The Gorham Technical Review Committee comprises all department heads, the Town Manager, and other town officials or employees. The Technical Review Committee has increased intradepartmental knowledge and decreased the time needed to authorize a site plan.	Town Manager, Department Heads & other pertinent staff, and officials as needed	Excellent	No Improvements Needed: The Gorham Technical Review Committee works very well. Members of the hazard mitigation planning team, many of whom are on the Committee, are pleased with the Committee's work to bring consensus and understanding to all parties involved in planning, land use, and building decisions for the Town. The Town's Technical Review Committee is recommended to other communities throughout the State.

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Life Safety & Fire Codes	Provides guidance for all buildings for life safety and fire codes	Fire Department	Good	No Improvements Needed: The National Fire Protection Association (NFPA), along with the NH safety and fire codes, guides the Gorham Fire Department to inspect all commercial, public assembly, and rental properties. The Gorham Fire Department does its best to provide timely inspections based on available human resources.
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, the impervious surface limitations, and includes the shoreland permit by notification process.	State of NH	Good	No Improvements Needed: The Town of Gorham meets the regulations detailed in the Shoreland Water Quality Protection Act. Compliance with the Act is encouraged and enforced by the Town's Building Inspector/Code Enforcement Officer and the State of NH when needed.
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 of Gorham, Gorham Fire & EMS, the Police Department, the Gorham Public Library, the Parks & Recreation Department, the Medallion Opera House, the Edward Fenn Elementary, and the Gorham Middle/High School. These social media accounts work very well to keep the citizens of Gorham informed about things happening in their town. No improvements are needed at this time.
Mutual Aid Agreements (Fire, Police, PWD)	Mutual Aid agreements provide communications capabilities and cooperative assistance between area cities and towns; mutual aid provides access to resources appropriate to the emergency's scope.	Fire Department, Police Department, Public Works Department	Good	No Improvements Needed: The Gorham Fire Department has a mutual aid agreement with the Northern NH Fire Mutual Aid District. The Gorham Police Department has mutual aid agreements with surrounding towns, the NH State Police (Troop F), the Coos County Sheriff's Office, and Fish & Game. The Public Works Department is a NH Public Works Mutual Aid Association member. All mutual aid systems in Gorham work well. (Emergency Preparedness)

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
State Health Department Public Health Plan	The State Health Department's "Influenza, Pandemic, Public Health Preparedness and Response Plan" is written by the State health department to be prepared for any public health emergency. Gorham is part of the North Country Regional Public Health Emergency Annex.	North Country Regional Public Health Network	Good	No Improvements Needed: The State Public Health Plan assists the Community as part of North Country Regional Public Health Network's services. The Gorham Health Officer attends public health meetings whenever possible. (Emergency Preparedness)
Local Road Design Standards	Local road design standards are specifications for the construction of new roads in a community.	Select Board & Public Works Department	Good	No Improvements Needed: Local road standards have been established within the Subdivision Regulations and Site Plan Review process to ensure that state standards for road specifications are safely met. The Town will not assume ownership of roads not built to Class V standards. Acceptance of new roads is voted at Town Meeting as a Warrant Article.
Emergency Action Plan (Dams)	Dam Emergency Action Plans are designed to provide notification and evacuation procedures should a dam failure occur.	Brookfield Hydro	Good	No Improvements Needed: The Fire Department has a copy of the dam Emergency Action Plan (EAP) for the only High Hazard dam, the Cascade Hydro Dam. Gorham's emergency responders work with the dam owners to ensure residents' safety. (Emergency Preparedness)
Building Code & Permits	The Town has adopted the International Building Codes (IBC) and the International Residential Codes (IRC). Builders must follow these codes for new construction so that national standards for flood, wind, earthquake, fire, and snow load are met.	Code Enforcement Officer	Good	No Improvements Needed: The Town of Gorham has a Code Enforcement Officer. The permitting process requires builders to abide by the International Building Codes (IBC) and the International Residential Codes (IRC), which the Town and the State have adopted. The building process does what it is meant to do.
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 knows fire permitting requirements and the ability to get permits online (\$5.50 fee required).

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Burning Index	New Hampshire Forests & Lands (DNCR) has a burning index that measures the wildfire risk and 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 it, and the type of equipment that might be needed.	NH Hampshire Forests & Lands (DNCR) & Fire Department	Good	No Improvements Needed: The Fire Department receives regular notification of the burning index via fax and email from NH Forests & Lands. This notification is made daily during the fire danger season, and a Fire Danger Sign is located at the Gorham Fire Station. No burn days can also be issued through the online process.
Capital Reserve Fund (CRF)	A type of account on a town's balance sheet reserved for long-term capital investment projects or any other large and anticipated expense(s) that will be incurred in the future. Reserve funds are set aside to ensure adequate funding to at least partially finance future projects, equipment, and other expenditures.	Select Board & Budget Committee	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 Gorham Capital Reserve Funds work well and are part of the Town Warrant at the annual Town Meeting.

Chapter 7: Last Mitigation Plan

A. DATE OF LAST PLAN

Based on the Disaster Mitigation Act (DMA) of 2000, Gorham has developed hazard mitigation plans in the past. The most recent update was formally approved in 2016. The Gorham Hazard Mitigation Plan Update 2024 updates the 2016 plan.

Below are the action items that were identified in the 2016 plan. The Team identified the 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 2016 Hazard Mitigation Plan. Four additional columns not shown here – *Type of Hazard, Responsibility or Oversight, Funding or Support*, and *Estimated Cost* – can be found in the 2016 Hazard Mitigation Plan.

TABLE 7.1: ACCOMPLISHMENTS SINCE THE LAST PLAN

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
0-1	Action Item #1: NIMS & ICS Training for Town Officials in order to have better trained individuals handling disaster events so that the effects of the event can be mitigated. (ICS 100 & 200; NIMS 700) (Tables 6.1 & 7.1)	Short Term Ongoing for the life of the Plan and as new staff is hired	Completed & Deferred: Most emergency responders have completed NIMS & ICS training, but many town officials have not. Although this is preparedness, this strategy was deferred to this Plan to continue providing NIMS (IS-700) & ICS (ICS 100 & ICS 200) training to new first responders and new town officials as they become elected or appointed. Action Item #8

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
0-2	Action Item #2: Lobby the USFS to provide proper bank stabilization to mitigate the landslide area and the fluvial erosion of the Peabody River, as this, and potentially other sites upstream, are causing the river to divert towards White Birch Lane and NH Route 16 and cause flooding. (ER5) (Table 7.1) (Refer to Appendix G)	Short Term One year or less and continued until accomplished	Partially Completed & Deferred: Combined with Action Item #16 from the previous plan. Action Item #37
0-3	Action Item #3: Establish and maintain a list of functional needs persons by promoting voluntary participation to coincide with HIPAA laws; create a database to track those individuals at high risk of death, such as the elderly, homeless, etc. (website, mailing, Town Report, Facebook, visits) (ET3) (Table 7.1)	Short Term Ongoing for the life of the Plan	Partially Completed & Deferred: A survey was done to identify the functional needs population in Gorham. However, a new and updated survey should be completed, along with a way to maintain it. Action Item #6
0-4	Action Item #4: Review the currently available swift water rescue equipment inventory and determine additional equipment needs and training for local responders. (Table 7.1)	Short Term One year or less and then ongoing training for the life of the Plan	Deleted: Although the Fire Department could always use additional swift water rescue equipment, this strategy from the prior plan was deleted as this is preparedness, not mitigation. (Emergency Preparedness)
0-5	Action Item #5: Develop a more formal maintenance program and appropriate recording keeping for future use and conduct regular maintenance of all fire hydrants to reduce risk. (WF7)	Short Term Ongoing for the life of the Plan	Deferred: Hydrants are flushed and pressure tested each year, with any problems noted on the paperwork and then addressed. The Town also expects to receive grant money to cover the cost of asset management plans for water and wastewater. This strategy was deferred to complete the installation and training required to implement an asset management plan for the water and wastewater to improve the record keeping of maintenance performed. Action Item #29
0-6	Action Item #6: Continue efforts to trim tree limbs around power lines and remove brush as part of the Tree Maintenance Program to mitigate the loss of power and road closures during high wind events. (SW4) (Table 6.1)	Short Term Ongoing for the life of the Plan	Completed & Deferred: As trees become damaged and threaten power lines and structures on town roads, the Public Works Department and Eversource remove them; Eversource is responsible for repairing power lines. NH DOT and Eversource do this for state roads as needed. This strategy was deferred to continue local tree and brush removal efforts to help mitigate the effects of high wind events, ice storms, wildfires, and other natural hazards. Action Item #1 (also in Table 6.1)

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
0-7	Action Item #7: Establish an interactive webpage for educating the public on hazard mitigation and preparedness measures (MU14) by adding a page to the Town's website and at the annual safety fair, that will include such information as emergency contacts, shelter locations, evacuation routes (SW7, WF11 & T3), methods of emergency alerting, 911 compliance, water saving techniques (D9), earthquake risk and mitigation activities that can be taken in residents' homes (EQ7), steps homeowners can take to protect themselves and their properties when extreme temperatures occur (ET1 & ET4), safety measures that can be taken during hail (HA3) and lightning storms (L2), mitigation techniques for property protection and links to available sources; educate homeowners regarding the risks of building in hazard zones and encourage homeowners to install carbon monoxide monitors and alarms. (WW5) (Table 7.1)	Short Term One year or less and then ongoing with updates	Completed & Deferred: An Emergency Management (EM) webpage can be accessed from the Town's website through "Departments". The EM webpage contains some emergency-related links; however, more information can be added to provide robust information for residents on emergency preparedness and mitigation techniques to reduce or eliminate the impact of natural hazards. This strategy was deferred to continue developing and providing robust information and links on the Emergency Management webpage to educate the public on general and seasonal mitigation techniques and consider moving the Emergency Management link to the home page. The Town can also get information via social media platforms (see Table 2.1). Action Item #11
0-8	Action Item #8: Lobby the State of NH to do the necessary work to mitigate this erosion in an effort to protect the run-off truck ramp by providing the proper bank stabilization. (ER5) (Table 7.1) (Refer to Appendix G)	Short Term One year or less and continued until accomplished	Deleted: Lobbying the State about the truck run-off ramp was not done due to changing priorities. This strategy from the prior plan was deleted because there is no need for work on the truck run-off ramp.
1-1	Action Item #9: Establish a committee to produce a more comprehensive Capital Improvement Plan and incorporate mitigation actions from this Plan. (MU6) (Table 6.1)	Short Term 1-2 years	Partially Completed & Deferred: Although a Capital Improvement Committee has been established, no Capital Improvement Plan (CIP) has been implemented. This strategy was deferred to continue developing a CIP and incorporate items from this Plan into a new CIP. Action Item #23 (also in Table 6.1)
1-2	Action Item #10: Apply for HMPG funding to obtain a permanent generator for the Middle/High School so that it can effectively be used as a Primary Shelter. (MU13) (Table 7.1)	Short Term 1-2 years	Deferred: Due to changing priorities, a permanent generator for the Middle/High School was not obtained as suggested in the prior hazard mitigation plan. This strategy was deferred to seek funding and obtain a permanent generator for this vital facility, the designated Primary Shelter. Action Item #27
1-3	Action Item #11: Establish a method to notify the public when high water levels are reached. (F7) (F10) (Table 6.1) (Refer to Appendix)	Short Term 1-2 years	Completed & Deleted: A local notification method for high water levels on the Androscoggin River was not established. However, CodeRED is an excellent notification system that can be used for high water notifications and other emergencies. The general procedure is for Brookfield Hydro to notify Gorham Dispatch, who then notifies the designated town officials (phone tree) to activate the CodeRED reverse calling system if necessary in the area where flood danger may occur. An additional notification system was deemed unneeded; therefore, this strategy was deleted.

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
1-4	Action Item #12: Educate residents who live on private roads and long driveways of the importance of maintaining their roads for first responders by adding information to the Town's website. (WF8)	Short Term 1-2 years	Deferred: Public education on maintaining private roads was not done due to oversight and changing priorities. This strategy was deferred to promote private mitigation efforts and provide public outreach to the citizens of Gorham on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. This action item will help ensure accessibility for emergency response. Action Item #16
1-5	Action Item #13: Advise the public about the local flood hazard, flood insurance, and flood protection measures (F10) by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Offices; give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether or not they are in the flood zone and provide appropriate links to the NFIP and Ready.gov on the Town's website.	Short Term 1-2 years	Completed & Deferred: The Town developed a flood ordinance and became a National Flood Insurance Program (NFIP) member on April 1, 1981. The Town's Flood Ordinance works well to successfully prohibit or force compliance to the ordinance for building and substantial improvements to structures within the FEMA flood zone. This strategy was 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 properties are in the FEMA floodplain. This strategy was also deferred to provide robust information on flood mitigation techniques that can be taken to protect individual homes and properties using the Town's website or social media pages. Provide links to the NFIP, Ready.gov, and other pertinent websites. Action Item #14 (also in Table 6.1)
1-6	Action Item #14: Add information to the Town's Emergency Management webpage about the risks of carbon monoxide and gas grills. (MU14 & WF12)	Short Term 1-2 years	Completed & Deferred: This strategy was combined with Action Item #7 from the prior plan and includes public education on the operation of gas grills and carbon monoxide detection. Action Item #11
1-7	Action Item #15: Obtain and have available "Firewise" brochures to educate homeowners on methods to reduce fire risk around their homes (WF10); provide "Firewise" brochures to those residents seeking burn permits; advise residents of the importance of maintaining defensible space, the safe disposal of yard and household waste and the removal of dead or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches and yards. (WF12)	Short Term 1-2 years	Completed & Deferred: The Fire Department and other town officials have advised residents in the past on the risk of wildfires and mitigation measures that can be taken. This strategy from the last plan was deferred to provide fire safety information and notices of red flag burning days on a new Emergency Services webpage, other social media platforms, or newsletters. Obtain and have available Firewise® information and provide mitigation strategies to educate homeowners on methods to reduce fire risk around their homes. Provide fire safety brochures to those residents seeking burn permits. Action Item #12

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
2-1	Action Item #16: Conduct a comprehensive review of the Town's river banks, berms, and dikes and develop a prioritized list of projects for stabilization or enhancement of undersized infrastructure; this will insure readiness to move forward when grants become available to pursue projects to reduce flooding. (ER5) (F17) (Refer to Appendix G)	Medium Term 2-3 years	Partially Completed & Deferred: Fluvial erosion and riverbank instabilities are concerns along the Peabody River, the Moose River, Moose Brook, and other small rivers and streams in Gorham. Multiple entities need to work together to solve these erosion and riverbank issues. The Town has lobbied to encourage mitigation to reduce fluvial erosion and bank instability. Areas along a good stretch of the Peabody River, the Moose River at Braeburn Village, and other areas that need riverbank stabilization and possibly dredging have been identified. However, new and accurate data is needed, and a complete study of flood and erosion issues should be developed. This strategy was deferred to work in conjunction with the Department of Environmental Services (DES), the US Forest Service, the Army Corp of Engineers, other agencies, and property owners along the Town's riverways to identify specific areas for improvements and plan the necessary steps to mitigate flooding and erosion. Action Item #37
2-2	Action Item #17: Update the Master Plan and incorporate a natural hazard section. (MU5) (Table 6.1)	Medium Term 2-3 years	Completed & Deferred: The Gorham Master Plan was last updated in 2020 and will not be ready for a state-recommended 10-year complete update until 2030. This strategy was deferred to annually review the Master Plan and consider including a natural hazards section, a discussion on climate change, and mitigation action items from this hazard mitigation plan in all future updates. Action Item #17 (also in Table 6.1)
2-3	Action Item #18: Apply for HMPG funding to upgrade the 6' culvert on Spring Road with a bridge to mitigate stormwater flooding issues. (F13) (Table 7.1) (Refer to Appendix G)	Medium Term 2-3 years	Completed & Deleted: The Gorham DPW has improved the stormwater flooding issues on Spring Road by replacing a bridge and adding a larger culvert. The Town received HMPG grant funding (75/25) for this work. The work is complete; therefore, this strategy was deleted.
2-4	Action Item #20: Consider revising the subdivision regulations to include limits on driveway slope and the slope upon which new construction can take place. (MU4) (Table 6.1)	Medium Term 2-3 years	Completed & Deleted: The Gorham Subdivision Regulations were recently reviewed and updated in 2021; these regulations address building on steep slopes, lot size, road frontage, and other guidelines for potential builders. Driveway steepness, traffic congestion, and criteria are discussed case-by-case by the Town's Technical Review Committee. This strategy was deleted as the Planning Board has addressed steep slopes.
2-5	Action Item #19: Research currently available technology to see what can be purchased and install panic buttons at the public schools and the water and sewer departments to protect critical infrastructure and key resources. (MU13) (Table 7.1)	Medium Term 2-3 years	Deferred: Panic buttons have not been installed due to changing priorities. However, the proposed budgets for 2023 include recommendations for panic buttons at the information booth, the library, the school, the highway department garage, and locations within the sewer and water system; quotes for the work have already been obtained. Provided the budget was approved at the 2023 Town Meeting, this strategy was deferred for installing panic buttons at the above locations. Action Item #24 (Emergency Preparedness)
2-6	Action Item #20: Purchase an intrusion alarm for the water treatment facility on Jimtown Road to mitigate tampering and to protect the Town's water supply, a critical facility, and key resource. (MU13) (Table 7.1)	Medium Term 2-3 years	Deferred: Due to changing priorities and oversight, an intrusion alarm was not purchased for the water treatment facility. This strategy was deferred to research, available options, costs, and proposed enhanced security systems at the water treatment plant. Action Item #33

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
2-7	Action Item #21: Review the E-911 system to determine compliance with regards to signage and the need for a town-wide ordinance; promote community compliance by providing more public outreach to the Community. (MU14) (Table 6.1)	Medium Term 2-3 years	Completed & Deferred: Ongoing public education on the appropriate E-911 signage has been provided to the residents of Gorham. The Community is estimated to be 50-60% compliant with visible E-911 house signage. This strategy was deferred to promote appropriate E-911 signage to increase signage from 50-60% to 90%. Action Item #2
2-8	Action Item #22: Consider reviewing the floodplain policy as it relates to new development to reduce the risk to future buildings. (F1) (Refer to Appendix G)	Medium Term 2-3 years	Completed & Deferred: Gorham established the "Floodplain Development Ordinance" as part of the Zoning Ordinance, which was last reviewed and updated in March 2021. The floodplain ordinance works well to prohibit building in the flood zone. This strategy was deferred to review the floodplain ordinance as development trends change and incorporate items from this Plan into the ordinance where appropriate. Action Item #25
2-9	Action Item #23: Develop a list of properties that have consistently flooded and consider if mitigation efforts are effective or the property should be purchased and returned to the flood plain. (F12) (Refer to Appendix G)	Medium Term 2-3 years	Completed & Deleted: A list of consistently flooded properties has not been established. The current hazard mitigation team has determined that no properties should be acquired. Therefore, this strategy was deleted.
2-10	Action Item #24: Develop a written storm water maintenance plan that will include a complete list of bridges and culverts and a record of the maintenance of culverts and ditches with an eye towards improving storm water flow issues and flooding and to identify culverts that need improvements in the future; keep projects on-task and use when seeking funding for improvements. (F5) (Refer to Appendix G)	Medium Term 2-3 years	Partially Completed & Deferred: Although the Gorham PWD has developed a culvert and stormwater plan, this Plan can be further developed. The strategy was deferred to improve the current written inventory by adding additional detail about the location, condition, replacement time frame, and type of improvements that may be needed. Action Item #5 (also in Table 6.1)
2-11	Action Item #25: Improve the quality and functionality of mobile radios for all emergency responders and vehicles. (Table 6.1)	Medium Term 2-3 years	Partially Completed & Deferred: The Gorham Police Department has improved its communications capabilities by purchasing and installing new portable radios and a console for dispatch. Based on available professional studies and plans, this strategy was deferred to replace and update the aging repeater on Pine Mountain. Action Item #18 (Emergency Preparedness)
2-12	Action Item #26: Develop Memorandum of Understandings with the local snowmobile club and other agencies (State & private) who assist during snow emergencies. (Table 7.1)	Medium Term 2-3 years	Deleted: The Gorham Fire Department determined that access to snowmobiles is adequate without outside assistance. Therefore, this strategy from the prior plan was deleted.
2-13	Action Item #27: Revise and improve the internal permitting process so that all department heads, which are part of the Technical Review Committee, are aware of new permits and anticipated construction or improvement projects. (Table 6.1)	Medium Term 2-3 years	Partially Completed & Deferred: The Technical Review Committee has improved the permitting process by developing a process to expedite the process for internal use. This strategy was deferred to continue reviewing and updating the permitting process as needed and as new development trends evolve. Action Item #3

Rank	New Mitigation Project	Time Frame	Completed, Deleted, or Deferred
2-14	Action Item #28: Apply for HMPG funding to obtain a permanent generator for the Fire Station; important not only for first response but also as a possible Secondary EOC. (MU13) (Table 7.1)	Medium Term 2-3 years	Deferred: Although portable generators are available at the Fire Station, a permanent generator was not obtained due to oversight and funding. The Fire Station houses fire apparatus and gear, EMS vehicles and equipment, and is the designated Secondary EOC. This strategy was deferred to obtain funding and install a permanent generator at the Fire Station. Action Item #35
2-15	Action Item #29: Apply for HMPG funding to obtain a permanent generator for the DPW facility; important not only for first response but also as a possible Secondary EOC. (MU13) (Table 7.1)	Medium Term 2-3 years	Deferred: Although a portable generator is available at the PWD garage, a permanent generator was not obtained due to oversight and funding. The PWD houses the necessary equipment to respond to impacts from natural hazards. In addition, the PWD is designated as a possible Secondary EOC and provides diesel and gas for town vehicles. This strategy was deferred to obtain funding and install a permanent generator at the PWD garage. Action Item #36
3-1	Action Item #30: Acquire and install pumps at the sewer treatment plant to assist with the movement of sewage. (F18) (Refer to Appendix G)	Medium Term 2-3 years	Deferred: The installation of pumps at the sewer treatment plant was not completed due to changing priorities and funding. However, the Town is expected to receive grant money for replacing the electric motors for the spiral lift pumps and electrical upgrades for those pumps at the Wastewater Treatment Plant. This strategy was deferred to replace the spiral lift pumps' electric motors and perform electrical upgrades for pumps at the Wastewater Treatment Plant. Action Item #19
3-2	Action Item #31: Consider the development of a Regional Swift Water Rescue Team so that the North Country region can have swift water rescue experts in each community thus enabling local emergency responders to be a force multiplier. (Table 7.1) (Refer to Appendix G)	Medium Term 2-3 years	Deferred: Although attempts were made to develop a Regional Swift Water Rescue Team in Gorham, funding and training costs were prohibitive. The need and desire for a swift water rescue team still exist. Therefore, this strategy was deferred to explore currently available options to develop a team for the North Country. Action Item #32 (Emergency Preparedness)
3-3	Action Item #32: Research currently available technology to see what can be purchased and install a central town-wide freeze alarm and security system to protect critical infrastructure and key resources. (MU13) (Table 7.1)	Long Term 4-5 years	Deferred: Research currently available technology to see what can be purchased and install a central town-wide freeze alarm and security system to protect critical infrastructure and key resources. Action Item #31
3-4	Action Item #33: Update the Gorham Emergency Operations Plan to coincide with the new State of NH Emergency Operations Plan. (Table 6.1)	Long Term 4-5 years	Completed & Deferred: The Gorham Emergency Operations Plan (EOP) was last updated in 2021 and will be due for an update in 2026, based on the State's 5-year recommendation. The new EOP should include an EOC Call Alert List, a detailed Resource Inventory List, and Player Packets; it should also address the 18 ESFs in the NH State Emergency Operations Plan. This strategy was deferred to this Plan to update the EOP. Action Item #34 (also in Table 6.1) (Emergency Preparedness)

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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 the issues 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

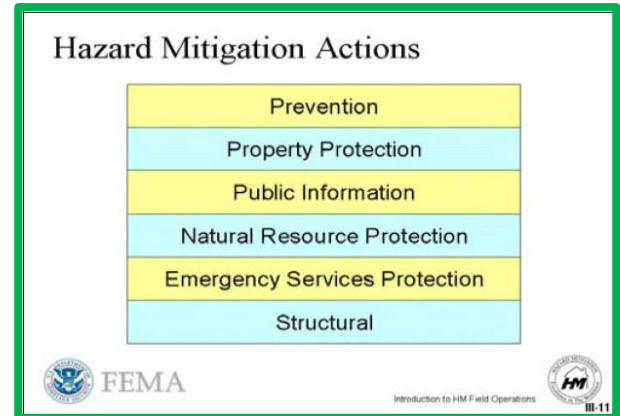
- Forest fire fuel reduction programs
- Special management regulations
- Fire Protection Codes NFPA 1
- Firewise® landscaping
- Culvert and hydrant maintenance
- Planning and zoning regulations
- Building Codes
- Density controls
- Driveway standards
- Slope development regulations
- Master Plan
- Capital 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)
- 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 Team considered each item from this comprehensive list of possible mitigation action items to determine if any of these action items could be put in place for Gorham, 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.

Each proposed mitigation action item aims “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 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 knew that some of these action items were more appropriately identified as preparedness or readiness issues. As no other established planning mechanisms recognize some of these issues, the Team did not want to lose 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 those for a town on the Jersey Shore. Therefore, the Town of Gorham has accepted the **Mitigation Action Items** in Tables 8.1 and 9.1 as the complete list of action items for this town and only this town. Furthermore, the Town of Gorham 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 action items to add now.

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: In addition to work done by and with local utility companies, monitor and maintain brush cutting, drainage system maintenance, and tree removal as part of a tree maintenance program. Create defensible space around power lines, oil and gas lines, and other infrastructure. Work to reduce wildfire risk by clearing dead vegetation and cutting the Community's high grass and other fuel loads. (SW4, WF7, WF9 & F14) (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	2	3	3	3	20
Action Item #2: Improve E-911 signage compliance so emergency responders can better assist the public. Use all available public outreach opportunities, including the Town's website, the Emergency Management webpage, a possible brochure, available social media platforms, and local newsletters. Other considerations may include the Town purchasing and installing signs for residents or having signs available for residents to install themselves. (MU14) (Table 7.1)	<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	2	3	3	3	20
Action Item #3: Review and update the permitting process as needed and as new development trends evolve. (MU6) (Table 7.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention	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 #4: Identify locations in town that would benefit from installing dry hydrants, drafting sites, cisterns, or fire ponds and work with local landowners to gain access to available water resources to help mitigate the effects of wildfire. Continue to maintain all hydrants (dry and pressurized) and drafting sites in the Community. (WF8, MU12 & MU13) (Table 6.1)	<u>Affected Location</u> -Areas of town without water resources -Hydrants & other water resources <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 #5: Maintain culverts and ditches in the Community and develop and maintain a written stormwater maintenance plan to ensure more efficient stormwater management. This plan, or "inventory", should include the location, installation date, GPS coordinates, material, type, size, age, and expected replacement date of all culverts, catch basins, and drainage ditches in the Community. (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 #6: Create a database to track those individuals at high risk of death, such as the elderly, homeless, etc., by developing a new and updated survey of the functional needs population and a method of maintaining the data. (ET3 & WW6) (Table 7.1)	<u>Affected Location</u> -Functional Needs Population <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection	3	3	3	2	3	3	3	20
		Political: Some people may not want to supply personal health information							
Action Item #7: Lobby the State to repair the retaining wall above Libby Pool to mitigate erosion issues that affect NH Route 16.	<u>Affected Location</u> -NH Route 16 retaining wall above Libby Pool <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 #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 7.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	2	3	3	3	3	20
		Administrative: May be time issues for staff members							
Action Item #9: Continue HazMat training for the members of the Gorham Fire Department. (Table 6.1)	<u>Affected Location</u> -Fire Station <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 #10: The Fire and Police Chiefs are to provide training for all firefighters and police officers, including the many aspects of emergency response. Training is done through the Northern NH Fire Mutual Aid District, the Department of Natural & Cultural Resources (DNCR), the Fire Academy, the Police Academy, and other available facilities. (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 #11: Provide robust information on the Emergency Management Department web page 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 techniques for drought, earthquakes, tornadoes, severe winter weather, lightning, and climate change. Provide information on the dangers of downed power lines, lightning, extreme temperatures, hail, and infectious diseases. Encourage homeowners to install carbon monoxide monitors and alarms and to monitor radon and other known and emerging contaminants in their homes. Offer reminders for residents and business owners to clear snow from roofs during high accumulation snow years and safely operate gas grills. Consider adding the Emergency Management Department link to the home page of the Town's website. (MU14, SW7, WF11, D9, T3, EQ7, ET1, ET4, L2, HA3, WW5) (Table 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 #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 Management page of the Town's website. Provide Firewise® brochures to those residents seeking burn permits (if not obtained online); 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) (Table 7.1)	<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
		No apparent difficulty with this action item							
Action Item #13: Provide public outreach to encourage all residents to contact CodeRED to add cell numbers, emails, and unlisted numbers and verify their information. Use the website, a possible brochure at the Town Office, social media platforms, or a sign-up at Town Meeting. (MU16) (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							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #14: Advise the public about the local flood hazard, flood insurance, and flood protection measures (F10) by obtaining and keeping on hand a supply of National Flood Insurance (NFIP) brochures to have available in the Town Offices. Give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether in the flood zone or not. Through public outreach, educate homeowners on the risks of building in the flood zone and measures that can be taken to reduce the chance of flooding. Add links to the NFIP, Ready.gov, and other flood mitigation information to the Town's Emergency Management webpage, a possible brochure, available social media platforms, and available local newsletters. Work with residents to ensure they comply with the Town's floodplain ordinance. (F23) (Tables 6.1 & 7.1)	Affected Location -Areas prone to flooding Type of Activity -Prevention -Public Education & Awareness -Property Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #15: Provide public outreach to the citizens of Gorham regarding the availability of the Town Hall and the Ed Fenn School (no AC) as cooling or warming centers during extended high temperatures and severe winter weather. (ET3 & WW6)	Affected Location -Town Hall & Ed Fenn School Type of Activity -Prevention -Public Education & Awareness	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #16: To promote private mitigation efforts, provide public outreach to the citizens of Gorham on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. This will help to ensure accessibility for emergency response and decrease the wildfire risk. (MU16) (Table 7.1)	Affected Location -Private Roads Type of Activity -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	1	3	3	3	19
		Political: Some residents may be reluctant to maintain their private roads for emergency response access							
Action Item #17: Review this Plan, the Gorham Hazard Mitigation Plan Update 2024, whenever an annual review of the Master Plan is done, and consider incorporating a discussion on climate change, a natural hazards section, and mitigation action items from this Plan. (MU6) (Tables 6.1 & 7.1)	Affected Location -Townwide Type of Activity -Prevention	3	3	2	3	3	3	3	20
		Administrative: Time limitations may impact the review of the Master Plan/HMP Economical: Could be a cost if a private contractor is hired							
Action Item #18: Replace or update the aging repeater on Pine Mountain based on available professional studies and plans, possibly moving the repeater higher up in the Town to improve communications. (MU13) (Table 7.1)	Affected Location -Pine Mountain Type of Activity -Prevention -Emergency Service Protection -Structural Project	3	3	3	2	3	1	3	18
		Political: The Town must cooperate with Shelburne, Randolph, and the Unincorporated Locations in the region Economical: Budget constraints							
Action Item #19: Replace the electric motors for the spiral lift pumps and perform electrical upgrades for pumps at the Wastewater Treatment Plant. (MU13) (Table 7.1)	Affected Location -Sewer treatment plant Type of Activity -Prevention -Property Protection -Natural Resource Protection -Structural Project	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 #20: Improve the aging culvert on Jimtown Road near the Town Forest by replacing the culvert, homemade header, and side walls with the same size (6 feet) culvert and a precast header and sidewalls, depending on engineering studies. These improvements will ensure continued access into this area of Gorham for residents, emergency responders, and other town officials and prevent future flooding. (F13)	<u>Affected Location</u> -Culvert on Jimtown Road near the Town Forest <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 #21: Provide an annual review of the Gorham Hazard Mitigation Plan Update 2024, including a review of the status of the "Action Items" listed in this Plan to encourage completion. Obtain approval from the local elected body annually and provide a complete plan update 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
Action Item #22: 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
Action Item #23: The Capital Improvement Committee (CIC) to develop a townwide Capital Improvement Plan (CIP). After this hazard mitigation plan is approved, the CIC will review the CIP to integrate concepts, ideas, and action items from this Plan. (MU6) (Tables 6.1 & 7.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
Action Item #24: Install panic buttons at the information booth, library, school, DPW garage, and other locations within the sewer and water system as proposed in the 2023 budget. (Emergency Preparedness) (Table 7.1)	<u>Affected Location</u> -Information booth, the fire station, the library, the school, the highway department garage, and locations within the sewer and water system <u>Type of Activity</u> -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection	3	3	3	3	3	3	3	21
Action Item #25: Review the floodplain ordinance as development trends change and incorporate items from this Plan into the ordinance where appropriate. (F6) (Table 7.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	2	3	3	3	3	20

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #26: Review the Town's planning mechanisms, including but not limited to the Subdivision & Zoning Regulations, the Site Plan Review Regulations, and the Floodplain Regulations, and discuss changes that may mitigate the occurrence of and damage from the natural hazards identified in this Plan. (MU6) (Tables 6.1)	<u>Affected Location</u> -Townwide <u>Type of Activity</u> -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	2	3	3	3	3	20
		Administrative: The availability of time for this may be difficult based on the Planning Board's agenda							
Action Item #27: Obtain funding and install a permanent generator at the Gorham Middles/High School to ensure the use of this CIKR as the Primary Shelter during a long-term utility outage. (MU13) (Table 7.1)	<u>Affected Location</u> -Gorham Middle/High School <u>Type of Activity</u> -Prevention -Emergency Service Protection	3	3	3	2	2	2	3	18
		Political: Need agreement between the School District and the Town on the installation and maintenance of any generator Legal: The Town needs the cooperation of the School District Economical: Budget constraints							
Action Item #28: Review and update the Source Water Protection Plan accordingly. (MU6) (Table 6.1)	<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 #29: Inspect the functionality of all hydrants and maintain and repair all hydrants and other water resources in Gorham. Complete the installation and training required to implement an asset management plan for water and wastewater to improve the record-keeping of performed maintenance. (WF8) (Table 7.1)	<u>Affected Location</u> -Water & Sewer Treatment Plants <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 #30: 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. (L1)	<u>Affected Location</u> -TBD <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 #31: Research currently available technology to see what can be purchased and install a central townwide freeze alarm and security system to protect critical infrastructure and key resources. (MU13) (Table 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							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
Action Item #32: Explore currently available options to develop a Swift Water Rescue Team for the North Country. (Emergency Preparedness) (Table 7.1)	Affected Location -Townwide	3	3	2	3	3	2	3	19
	Type of Activity -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	Administrative: Finding physically capable members of the Fire Department to train Economical: Budget constraints							
Action Item #33: Research options and costs and propose enhanced security systems at the water treatment plant. (MU12) (Table 7.1)	Affected Location -Water & Sewer Treatment Plants	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 #34: Update the Gorham Emergency Operations Plan to coincide with the State's 18-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, a detailed Resource Inventory List, and Player Packets. (MU6) (Tables 6.1 & 7.1)	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 #35: Obtain funding and install a permanent generator at the Gorham Fire Station/EMS to ensure the capabilities of this essential Emergency Response Facility. (MU13) (Table 7.1)	Affected Location -Gorham Fire Station	3	3	3	3	3	2	3	20
	Type of Activity -Prevention -Emergency Service Protection	Economical: Budget constraints							
Action Item #36: Obtain funding and install a permanent generator at the Gorham Public Works facility so that this essential CIKR can respond during emergencies. All town departments use the fuel pumps and vehicle maintenance facility at this CIKR. (MU13) (Table 7.1)	Affected Location -Gorham DPW facility	3	3	3	3	3	2	3	20
	Type of Activity -Prevention -Emergency Service Protection	Economical: Budget constraints							
Action Item #37: Work in conjunction with the Department of Environmental Services (DES), the US Forest Service, the Army Corp of Engineers, other agencies, and property owners along the Town's riverways to identify specific areas for improvements and plan the necessary steps to mitigate flooding and erosion. (F20 & ER5) (Table 7.1)	Affected Location -Riverbanks townwide	1	1	1	1	1	1	1	7
	Type of Activity -Prevention -Public Education & Awareness -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	Social: People who are not affected may not approve of the time and money spent on this project Technical: This will be a significant project with many hurdles to overcome Administrative: Gaining accurate data will be challenging Political: The Town needs cooperation from many entities to accomplish this Legal: The Town does not own the properties Economical: Budget constraints if work is done Environmental: Approvals will be needed for all work							

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Chapter 9: Implementation Schedule for Prioritized Action Items

A. PRIORITY METHODOLOGY

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

CATEGORY A

Category A includes those items that 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 generally taking 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 STAPLEE scores. 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 following criteria were considered 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 evaluate the new hazard mitigation action items they brainstormed throughout the 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 frames, and methods 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.

Key to the Estimated Cost

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

Key to the Time Frame

Life of PlanStarting on Plan adoption 2024-2029 (0-60 months)
Short Term1 year 2024-2025 (0-12 months)
Medium Term2 years starting in 2025 – 2027 (12 – 36 months)
Long-term3 years starting in 2026 – 2029 (36 -60 months)

In the following table, “Final R/P” means final rate and priority. 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 R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-1	<p><i>Problem Statement: As trees become damaged and threaten power lines and structures on town roads, the Public Works Department and Eversource remove them; Eversource is responsible for repairing power lines. There is a need to continue to work to keep this hazard to a minimum.</i></p> <p>Action Item #1: In addition to work done by and with local utility companies, monitor and maintain brush cutting, drainage system maintenance, and tree removal as part of a tree maintenance program. Create defensible space around power lines, oil and gas lines, and other infrastructure. Work to reduce wildfire risk by clearing dead vegetation and cutting the Community's high grass and other fuel loads. (SW4, WF7, WF9 & F14) (Tables 6.1 & 7.1)</p>	High Wind Events, Wildfire, Severe Winter Weather-Ice Storms & Inland Flooding	Public Works Department	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)
A-2	<p><i>Problem Statement: The Town has continuously used public outreach to remind residents of the need for proper E-911 signage. However, the Town is only about 50-60% compliant with the proper E-911 signage.</i></p> <p>Action Item #2: Improve E-911 signage compliance so emergency responders can better assist the public. Use all available public outreach opportunities, including the Town's website, the Emergency Management webpage, a possible brochure, available social media platforms, and local newsletters. Other considerations may include the Town purchasing and installing signs for residents or having signs available for residents to install themselves. (MU14) (Table 7.1)</p>	All Hazards	Fire Department	Local	Life of the Plan	Low Cost \$1,000-\$20,000
A-3	<p><i>Problem Statement: The Technical Review Committee has improved and expedited the permitting process for internal use. However, the permitting process should be reviewed and updated as new development trends evolve.</i></p> <p>Action Item #3: Review and update the permitting process as needed and as new development trends evolve. (MU6) (Table 7.1)</p>	All Hazards	Technical Review Committee & Planning Board	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-4	<p><i>Problem Statement: A water resource plan through NCRC&D was completed in 2008 before this program was eliminated. Water resource capabilities throughout the Community need to be assessed, and the need for additional water resources needs to be considered.</i></p> <p>Action Item #4: Identify locations in town that would benefit from installing dry hydrants, drafting sites, cisterns, or fire ponds and work with local landowners to gain access to available water resources to help mitigate the effects of wildfire. Continue to maintain all hydrants (dry and pressurized) and drafting sites in the Community. (WF8, MU12 & MU13) (Table 6.1)</p>	Wildfires & Conflagration	Fire Department & Department of Public Works	Local & Grants	Life of the Plan	<p>Very Low Cost (\$0 - \$1,000 or staff time only - cost could be incurred for installations)</p>
A-5	<p><i>Problem Statement: Although the Gorham Public Works Department works to clean and repair drainage basins and culverts and has established a written stormwater maintenance plan, the plan should be developed to ensure continuity of actions and efficient stormwater management.</i></p> <p>Action Item #5: Maintain culverts and ditches in the Community and further develop and maintain a written stormwater maintenance plan to ensure more efficient stormwater management. This plan, or "inventory", should include the location, installation date, GPS coordinates, material, type, size, age, and expected replacement date of all culverts, catch basins, and drainage ditches in the Community. (F5) (Tables 6.1 & 7.1)</p>	Inland Flooding	Public Works Department	Local	Life of the Plan	<p>Low Cost \$1,000-\$20,000 (depending on culvert replacement needs)</p>
A-6	<p><i>Problem Statement: A survey was done to identify the functional needs population in Gorham. Although a list of the functional needs population exists, a new and updated survey should be completed along with a way to maintain it.</i></p> <p>Action Item #6: Create a database to track those individuals at high risk of death, such as the elderly, homeless, etc., by developing a new and updated survey of the functional needs population and a method of maintaining the data. (ET3 & WW6) (Table 7.1)</p>	Extreme Temperatures, Severe Winter Weather & All Hazards	Town Manager & Emergency Management Director	Local	Life of the Plan	<p>Very Low Cost (\$0 - \$1,000 or staff time only)</p>

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-7	<p>Problem Statement: Although on the State's 10-year road plan, the retaining wall on NH Route 16 above Libby Pool is aging and is no longer secure. Pieces of the retaining wall keep falling off, and a wall failure could effectively shut down NH Route 16 for residents and emergency responders.</p> <p>Action Item #7: Lobby the State to repair the retaining wall above Libby Pool to mitigate erosion issues that affect NH Route 16. (ER5)</p>	Landslide & Erosion & Aging Infrastructure	Town Manager, Emergency Management Director, Department of Public Works & Select Board	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)
A-8	<p>Problem Statement: Although first responders, including firefighters, have received NIMS & ICS training, not all of Gorham's town officials have.</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. (Emergency Preparedness) (Table 7.1)</p>	All Hazards	Emergency Management	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)
A-9	<p>Problem Statement: Although Gorham does not have a HazMat Team, firefighters are trained in the basic response to HazMat incidents and are adept at maintaining perimeters until specialized teams arrive. The Gorham EMD or the Fire Officer in charge would likely call dispatch, who would then contact the State Fire Marshal's Office (FMO) or HSEM to request an available HazMat Response Team. HazMat training needs to continue.</p> <p>Action Item #9: Continue HazMat training for the members of the Gorham Fire Department. (Emergency Preparedness) (Table 6.1)</p>	Hazardous Materials	Fire Department	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-10	<p><i>Problem Statement: Training of all firefighters and police officers is coordinated by the Fire Chief and Police Chief, respectively. Training includes the many aspects of emergency response. This training needs to continue.</i></p> <p>Action Item #10: The Fire and Police Chiefs are to provide training for all firefighters and police officers, including the many aspects of emergency response. Training is done through the Northern NH Fire Mutual Aid District, the Department of Natural & Cultural Resources (DNCR), the Fire Academy, the Police Academy, and other available facilities. (Emergency Preparedness) (Table 6.1)</p>	All Hazards	Fire Department & Police Department	Local & Grants	Life of the Plan	Low Cost \$1,000-\$20,000
A-11	<p><i>Problem Statement: Although the Town has established an Emergency Management page to provide public education on emergency preparedness and mitigation, these efforts should continue into the future.</i></p> <p>Action Item #11: Provide robust information on the Emergency Management Department web page 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 techniques for drought, earthquakes, tornadoes, severe winter weather, lightning, and climate change. Provide information on the dangers of downed power lines, lightning, extreme temperatures, hail, and infectious diseases. Encourage homeowners to install carbon monoxide monitors and alarms and to monitor radon and other known and emerging contaminants in their homes. Offer reminders for residents and business owners to clear snow from roofs during high accumulation snow years and how to operate gas grills safely. Consider adding the Emergency Management Department link to the home page of the Town's website. (MU14, SW7, WF11, D9, T3, EQ7, ET1, ET4, L2, HA3, WW5) (Table 7.1)</p>	All Hazards including: Severe Wind, Drought, Earthquake, Extreme Temperatures, Hail, Lightning, Severe Winter Weather, Tornado, Wildfire, Known & Emerging Contaminants & Infectious Disease	Town Manager & All Department Heads	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-12	<p><i>Problem Statement: Although the Town does a good job using its Emergency Management webpage to promote preparedness, residents may not be aware of the steps they can take to reduce the fire risk at their homes.</i></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 Management page of the Town's website. Provide Firewise® brochures to those residents seeking burn permits (if not obtained online); 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) (Table 7.1)</p>	Wildfire & Conflagration	Town Manager & Fire Department	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)
A-13	<p><i>Problem Statement: CodeRED is an excellent warning system but only stores resident hard-line phone numbers. Residents should be encouraged to provide additional information to the CodeRED system to ensure notification.</i></p> <p>Action Item #13: Provide public outreach to encourage all residents to contact CodeRED to add cell numbers, emails, and unlisted numbers and verify their information. Use the website, a possible brochure at the Town Office, social media platforms, or a sign-up at Town Meeting. (MU16) (Table 6.1)</p>	All Hazards	Town Manager & Emergency Management Director	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-14	<p>Problem Statement: Residents and builders may not be aware of flood regulations and the availability of flood insurance through the National Flood Insurance Program (NFIP). They also may not be aware of the risk of building in the floodplain and the steps they can take to reduce flooding.</p> <p>Action Item #14: Advise the public about the local flood hazard, flood insurance, and flood protection measures (F10) by obtaining and keeping on hand a supply of National Flood Insurance (NFIP) brochures to have available in the Town Offices. Give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether in the flood zone or not. Through public outreach, educate homeowners on the risks of building in the flood zone and measures that can be taken to reduce the chance of flooding. Add links to the NFIP, Ready.gov, and other flood mitigation information to the Town's Emergency Management webpage, a possible brochure, available social media platforms, and available local newsletters. Work with residents to ensure they comply with the Town's floodplain ordinance. (F23) (Tables 6.1 & 7.1)</p>	Inland Flooding	Town Manager & Select Board	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)
A-15	<p>Problem Statement: Although public outreach has been done to advise the citizens of Gorham of the possibility of using the Town Hall and the Ed Fenn School (no AC) as cooling and warming shelters, additional public outreach should be done.</p> <p>Action Item #15: Provide public outreach to the citizens of Gorham regarding the availability of the Town Hall and the Ed Fenn School (no AC) as cooling or warming centers during extended high temperatures and severe winter weather. (ET3 & WW6)</p>	Extreme Temperatures & Severe Winter Weather	Town Manager & Emergency Management Director	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-16	<p>Problem Statement: Residents may not be aware of the importance of maintaining their private roads to allow access to emergency responders and to prevent wildfires.</p> <p>Action Item #16: To promote private mitigation efforts, provide public outreach to the citizens of Gorham on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. This will help to ensure accessibility for emergency response and decrease the wildfire risk. (MU16) (Table 7.1)</p>	Wildfire & Conflagration	Town Manager & Planning Board	Local	Life of the Plan	Very Low Cost (\$0 - \$1,000 or staff time only)
A-17	<p>Problem Statement: The Gorham Master Plan (2020) is reviewed annually. A total update is recommended in 2030 based on the State's 10-year recommendation. The Plan does not have a "Natural Hazards" section.</p> <p>Action Item #17: Review this Plan, the Gorham Hazard Mitigation Plan Update 2024, whenever an annual review of the Master Plan is done, and consider incorporating a discussion on climate change, a natural hazards section, and mitigation action items from this Plan. (MU6) (Tables 6.1 & 7.1)</p>	All Hazards	Planning Board	Local	Life of the Plan	Low Cost \$1,000-\$20,000
B-1	<p>Problem Statement: The aging repeater on Pine Mountain should be updated or replaced. The Planning Board has approved a height increase of 20 feet; moving the repeater higher up on the tower could enhance communications capabilities.</p> <p>Action Item #18: Replace or update the aging repeater on Pine Mountain based on available professional studies and plans, possibly moving the repeater higher up in the Town to improve communications. (MU13) (Table 7.1)</p>	All Hazards	Emergency Management Director & the Communications Committee	Local & Grants	Short Term (0-12 months)	High Cost (\$100,000 or more)
B-2	<p>Problem Statement: The electric motors for the spiral lift pump need to be replaced.</p> <p>Action Item #19: Replace the electric motors for the spiral lift pumps and perform electrical upgrades for pumps at the Wastewater Treatment Plant. (MU13) (Table 7.1)</p>	All Hazards & Infectious Diseases	Water & Sewer Department	Local & \$100,000 in ARPA grant funds	Short Term (0-12 months)	High Cost (\$100,000 or more) before grant funding

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-3	<p>Problem Statement: The aging culvert on Jimtown Road is meeting the end of its lifespan; there is potential for flooding, and a failure of this culvert will limit accessibility to the top of Jimtown and Spring Roads and the Ice Gulch Reservoir.</p> <p>Action Item #20: Improve the aging culvert on Jimtown Road near the Town Forest by replacing the culvert, homemade header, and side walls with the same size (6 feet) culvert and a precast header and sidewalls, depending on engineering studies. These improvements will ensure continued access into this area of Gorham for residents, emergency responders, and other town officials and prevent future flooding. (F13)</p>	Inland Flooding	Department of Public Works	Local & Grants	Short Term (0-12 months)	Medium Cost (\$20,000-\$100,000)
B-4	<p>Problem Statement: This plan, the Gorham Hazard Mitigation Plan Update 2024, will require an annual review and a complete update in five years.</p> <p>Action Item #21: Provide an annual review of the Gorham Hazard Mitigation Plan Update 2024, including a review of the status of the "Action Items" listed in this Plan to encourage completion. Obtain approval from the local elected body annually and provide a complete plan update in five years. (MU11) (Table 6.1)</p>	All Hazards	Emergency Management Director	Local & Grants	Short Term (0-12 months) & Long Term (37-60 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
B-5	<p>Problem Statement: This plan, the Gorham Hazard Mitigation Plan Update, 2023, will need to be approved again as a Community Wildfire Protection Plan (CWPP).</p> <p>Action Item #22: 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 (0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-6	<p>Problem Statement: The Capital Improvement Committee has been formed to develop a townwide Capital Improvement Program (CIP). Individual departments have their own CIPs, but at this time, there is no townwide Capital Improvement Plan (CIP).</p> <p>Action Item #23: The Capital Improvement Committee (CIC) to develop a townwide Capital Improvement Plan (CIP). After this hazard mitigation plan is approved, the CIC will review the CIP to integrate concepts, ideas, and action items from this Plan. (MU6) (Tables 6.1 & 7.1)</p>	All Hazards	Town Manager, Select Board & Capital Improvement Committee	Local	Short Term (0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
B-7	<p>Problem Statement: Panic buttons have not been installed due to changing priorities. However, the proposed budgets for 2023 include recommendations for panic buttons at the information booth, the fire station, the library, the school, the highway department garage, and locations within the sewer and water system; quotes for the work have already been obtained.</p> <p>Action Item #24: Install panic buttons at the information booth, library, school, DPW garage, and other locations within the sewer and water system as proposed in the 2023 budget. (Emergency Preparedness) (Table 7.1)</p>	All Hazard	Finance Department	Local	Short Term (0-12 months)	Low Cost \$1,000-\$20,000
B-8	<p>Problem Statement: Gorham established the "Floodplain Development Ordinance" as part of the Zoning Ordinance; the Zoning Ordinance was last reviewed and updated in March 2021. The floodplain ordinance works well to prohibit building in the flood zone; however, it should be reviewed when this hazard mitigation plan is completed.</p> <p>Action Item #25: Review the floodplain ordinance as development trends change and incorporate items from this Plan into the ordinance where appropriate. (F6) (Table 7.1)</p>	Inland Flooding	Planning Board	Local	Short Term (0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-9	<p>Problem Statement: The Gorham Subdivision and Zoning Regulations and the Site Plan Review process were reviewed and updated in 2021; the Town's planning mechanisms are in good shape. However, they should be reviewed and integrated with this hazard mitigation plan after approval.</p> <p>Action Item #26: Review the Town's planning mechanisms, including but not limited to the Subdivision & Zoning Regulations, the Site Plan Review Regulations, and the Floodplain Regulations, and discuss changes that may mitigate the occurrence of and damage from the natural hazards identified in this Plan. (MU6) (Tables 6.1)</p>	All Hazards	Planning Board	Local	Short Term (0-12 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
C-1	<p>Problem Statement: Although Gorham has emergency backup power at many of the Town's Critical Infrastructure & Key Resources (CIKR), some CIKRs do not have backup emergency power, including the Gorham Middle/High School, the designated Primary Shelter.</p> <p>Action Item #27: Obtain funding and install a permanent generator at the Gorham Middle/High School to ensure the use of this CIKR as the Primary Shelter during a long-term utility outage. (MU13) (Table 7.1)</p>	All Hazards	Emergency Management Director & GRS Cooperative School Board	Local & Grants	Medium Term (13-36 months)	High Cost (\$100,000 or more)
C-2	<p>Problem Statement: The 2016 Source Water Protection Plan is in place and does what it is intended to do. However, the plan should be reviewed and updated since the Town acquired the 2,000-acre Tinker Brook Parcel.</p> <p>Action Item #28: Review and update the Source Water Protection Plan accordingly. (MU6) (Table 6.1)</p>	All Hazards	Water & Sewer Department	Local	Medium Term (13-36 months)	Very Low Cost (\$0 - \$1,000 or staff time only)
c-3	<p>Problem Statement: Although hydrants are flushed and pressure tested annually, Gorham has no asset management plan for the water or wastewater systems.</p> <p>Action Item #29: Inspect the functionality of all hydrants and maintain and repair all hydrants and other water resources in Gorham. Complete the installation and training required to implement an asset management plan for water and wastewater to improve the record-keeping of performed maintenance. (WF8) (Table 7.1)</p>	All Hazards & Wildfire & Conflagration	Water & Sewer Department	Local & ARPA & NHDES funding	Medium Term (13-36 months)	High Cost (\$100,000 or more) before grant funding

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
C-4	<p>Problem Statement: <i>Lightning has struck town buildings in the past and has caused damage to electronics and power outages.</i></p> <p>Action Item #30: 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. (L1)</p>	Lightning	Town Manager & Emergency Management Director	Local	Medium Term (13-36 months)	Very Low Cost (\$0 - \$1,000 or staff time only - could incur a cost for installation if recommended)
C-5	<p>Problem Statement: <i>A townwide freeze alarm to protect critical facilities should be installed.</i></p> <p>Action Item #31: Research currently available technology to see what can be purchased and install a central townwide freeze alarm and security system to protect critical infrastructure and key resources. (MU13) (Table 7.1)</p>	All Hazards	Emergency Management	Local	Medium Term (13-36 months)	Low Cost \$1,000-\$20,000
C-6	<p>Problem Statement: <i>Although attempts were made to develop a Regional Swift Water Rescue Team in Gorham, funding and training costs were prohibitive. The need and desire for a swift water rescue team still exist.</i></p> <p>Action Item #32: Explore currently available options to develop a Swift Water Rescue Team for the North Country. (Emergency Preparedness) (Table 7.1)</p>	All Hazards & Inland Flooding	Fire Department	Local & Grants (maybe a grant from Central Rivers Power)	Medium Term (13-36 months)	Low Cost \$1,000-\$20,000
C-7	<p>Problem Statement: <i>There is no intrusion alarm for the water treatment facility.</i></p> <p>Action Item #33: Research options and costs and propose enhanced security systems at the water treatment plant. (MU12) (Table 7.1)</p>	All Hazards	Water & Sewer Department	Local & Grants	Medium Term (13-36 months)	Low Cost \$1,000-\$20,000
D-1	<p>Problem Statement: <i>The Gorham Emergency Operations Plan (EOP) was last updated in 2021 and will need to be updated again in 2026.</i></p> <p>Action Item #34: Update the Gorham Emergency Operations Plan to coincide with the State's 18-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, a detailed Resource Inventory List, and Player Packets. (MU6) (Tables 6.1 & 7.1)</p>	All Hazards	Emergency Management	Local & Grants	Long Term (37-60 months)	Very Low Cost (\$0 - \$1,000 or staff time only)

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
D-2	<p>Problem Statement: Although Gorham has emergency backup power at many of the Town's Critical Infrastructure & Key Resources (CIKR), some CIKRs do not have permanent backup emergency power, including the Fire Station (portable generators needed elsewhere).</p> <p>Action Item #35: Obtain funding and install a permanent generator at the Gorham Fire Station/EMS to ensure the capabilities of this essential Emergency Response Facility. (MU13) (Table 7.1)</p>	Wildfire & Conflagration	Emergency Management	Local & Grants	Long Term (37-60 months)	Medium Cost (\$20,000-\$100,000)
D-3	<p>Problem Statement: The Gorham Public Works facility does not have a permanent generator. There is currently a portable generator at this location. The Gorham Public Works facility provides fuel and maintenance for all town vehicles.</p> <p>Action Item #36: Obtain funding and install a permanent generator at the Gorham Public Works facility so that this essential CIKR can respond during emergencies. All town departments use the fuel pumps and vehicle maintenance facility at this CIKR. (MU13) (Table 7.1)</p>	All Hazards	Emergency Management & Department of Public Works	Local & Grants	Long Term (37-60 months)	Medium Cost (\$20,000-\$100,000)
D-4	<p>Problem Statement: Fluvial erosion and riverbank instabilities are concerns along the Peabody River, the Moose River, Moose Brook, and other small rivers and streams in Gorham. Multiple entities need to work together to solve these erosion and riverbank issues. Areas along a good stretch of the Peabody River, the Moose River at Braeburn Village, and other areas that need riverbank stabilization and possibly dredging have been identified. However, new and accurate data is needed, and a complete study of flood and erosion issues needs to be developed.</p> <p>Action Item #37: Work in conjunction with the Department of Environmental Services (DES), the US Forest Service, the Army Corp of Engineers, other agencies, and property owners along the Town's riverways to identify specific areas for improvements and plan the necessary steps to mitigate flooding and erosion. (F20 & ER5) (Table 7.1)</p>	Erosion & Inland Flooding	Town Manager, Emergency Management Director, Planning Board, and select Board in cooperation with other agencies	Local & Grants	Long Term (37-60 months)	Low Cost \$1,000-\$20,000 (to start the project with the expectation that it will be a high cost if action is taken)

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 simple updates.

The Gorham Hazard Mitigation Plan Update 2024 is considered a work in progress. Three situations will prompt revisiting this Plan:

- First, at 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 achieving its stated purpose and goals. 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. This review will assess the Plan in the same manner that it is assessed annually, but it will undergo a thorough update based on changing conditions, development, and climate change. The five-year update will use the same planning process that was used to develop this Plan (see Narrative and Agendas in this Plan)
- 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.

The Emergency Management Director is responsible for initiating plan reviews and will consult with the hazard mitigation planning team identified in this Plan. In keeping with the adoption process, the public and stakeholders will have the opportunity for future involvement as they will be invited to participate in future reviews or updates. Before any review or update, public notice will be given through press releases in local papers, listservs, or social media platforms; 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. After this Plan's approval, the Town is encouraged to use these forms to document changes and accomplishments. Forms are available for years 1-4, expecting the five-year annual update to 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. Gorham completed its last hazard mitigation plan in 2016 and has completed many projects from that plan. Examples in Table 7.1 include providing fire and flood education to the public, updating the subdivision regulations to address steep slopes, upgrading a culvert on Spring Road, and promoting NIMS and ICS to all new town employees upon hire. As a result, the Town was able to integrate these actions into other town activities, budgets, plans, and mechanisms.

The Town of Gorham has agreed to incorporate a Community Wildfire Protection Plan (CWPP) into this planning document, the Gorham Hazard Mitigation Plan Update 2024. As part of this Plan, the Town will adopt the CWPP, which will be approved by the Department of Natural and Cultural Resources (DNCR).

The Town will incorporate elements from this Plan into the following documents:

GORHAM MASTER PLAN

Traditionally, Master Plans are updated every 5 to 10 years. A full update of Gorham's Master Plan was completed in 2020 and will not be due for a recommended update until 2030, which is outside the scope of this Plan. This last update of the Master Plan included a Natural Hazards section and integrated elements of the 2016 HMP. Future reviews and updates of the Master Plan will consider integrating concepts, ideas, and action items from this Hazard Mitigation Plan (**Action Item #17**).

GORHAM EMERGENCY OPERATIONS PLAN 2021 (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 Gorham EOP was completed in 2021 and will not be ready for an update until 2026. The new EOP will incorporate elements from this hazard mitigation plan (**Action Items #34**).

TOWN BUDGET, CAPITAL IMPROVEMENT PLAN & CAPITAL RESERVE FUNDS

The Town of Gorham maintains Capital Reserve Funds (CRFs) for major expenditures. The CRFs are adjusted annually in coordination with the Select Board and other town department heads and committees at budget time. The budget is then voted on at the annual Town Meeting. A committee has been formed to establish a Capital Improvement Plan (CIP), but no plan is in place yet. During the annual budget planning process, specific mitigation actions identified in this Plan that require town fiscal support will be reviewed for incorporation into the budget. **Refer to those Action Items that require local money or match money (multiple Action Items) or address the CIP and CRF.**

THE GORHAM ORDINANCES & SUBDIVISION REGULATIONS

As time goes by and the needs of the Town change, the Town's planning mechanisms will be reviewed and updated. In coordination with these actions, the Planning Board will review this Plan and incorporate any changes that help mitigate the Community's susceptibility to the dangers of natural, technical, or human-caused disasters. An example of this integration can be seen in this Plan's mitigation action item (**Action Items #25 & 26**).

The local governments will modify other plans and actions to incorporate hazard or wildfire issues. 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 September 8, 2021. The Plan was presented to the Town for review, submitted to HSEM/FEMA for Conditional Approval (*APA, Approved Pending Adoption*), formally adopted by the Select Board, and resubmitted to HSEM/FEMA for Final Approval. Once Final Approval from HSEM/FEMA was met, copies of the Plan were distributed to the Town, HESM, 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

GORHAM HAZARD MITIGATION PLAN UPDATE

PARTIES TO THE AGREEMENT

Mapping and Planning Solutions
Town of Gorham, NH

Current Plan Expiration: 5/16/2021
PDM19 Grant Expiration: 5/29/2023

This agreement between the Town of Gorham (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 to produce the Gorham 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 resulting from 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 NH Homeland Security (HSEM) on behalf of FEMA. When adopted, the Plan guides the Town, commissions, and departments; adopted plans do not include any financial commitments by the Town. Additionally, all adopted plans should address mitigation strategies for reducing the risk of natural, technological, human-caused, and wildfire 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.
- With the Team's assistance, 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 or other unforeseen conditions at the time.
- MAPS will assist the Team in developing goals, objectives, and action items and will clearly define the processes needed for 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 before submitting the Plan to HSEM for conditional approval. Upon conditional approval by HSEM, MAPS will provide the planning team with the necessary documents for plan adoption by the Gorham Select Board and continue to work with the Town until final approval and distribution of the Plan are complete.
- At its office, MAPS shall provide all supplies and space necessary to complete the Gorham 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 one hard copy of the Plan containing all signed documents and approvals and 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. 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" required by HSEM for this project's duration. These quarterly reports will be done online, and a copy of the report will be forwarded to the primary contact for Gorham.
- MAPS will provide annual plan maintenance reminders leading up to the next five-year plan update as long as MAPS is in operation.
- 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. Mapping and Planning Solutions 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 can support the planning process by identifying available town resources, including people who can access and 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 Public Works Director 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 principal 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 handouts, and placement of meeting announcements. This contact shall also 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 and the Code of Federal Regulations (CFRs).
- The proposed plan shall be submitted to the Select Board for consideration and adoption.

- After adoption and final approval from HESM is received, the Town will:
 - *Distribute copies of the Plan as it sees fit throughout the local community.*
 - *Develop a team to monitor and work toward plan implementation.*
 - *Publicize the Plan to the Community and ensure citizen awareness.*
 - *Encourage the integration of 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 \$7,500.00; an invoice will be sent to the Town for each payment as outlined below.

1. Initial payment upon receipt of the first invoice, one week before the first meeting.....	\$3,500.00
2. Second payment upon plan submittal to HSEM for APA (Approve Pending Adoption).....	\$3,700.00
3. Final payment upon project completion and receipt of final hard copy of the Plan	\$300.00
Total Fees.....	\$7,500.00

- **Payment Procedures:** The payment procedure is as follows:
 - MAPS will invoice the Town according to the schedule above
 - The Town will pay MAPS
 - 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, provided prescribed match amounts have been met.

- **Required Matching Funds:** This project's total cost under PDM19 is \$10,000, with a federal share of \$7,500 and a matching amount of \$2,500 (75%/25% split). Matching funds are the responsibility of the Town of Gorham, not MAPS. The Town will be responsible for providing and documenting all resources used to meet the FEMA required match. However, Mapping and Planning Solutions will 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 the project's end for the Town to use in its match fulfillment.
- **Project Period:** This project shall begin upon grant approval from HSEM and signing this agreement with MAPS 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 depends on 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 PDM19. Per the grant agreement between the Town and HSEM, all work must be completed by May 29, 2023. It is expected that this project will be completed well before the grant expiration date of May 29, 2023.

- **Ownership of Material:** The Town shall own all maps, reports, documents, and other materials produced during the project period; 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 diligently and efficiently according to the terms of this agreement. MAPS' responsibilities under this agreement depend upon the cooperation of the Town of Gorham. 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 Mapping and Planning Solutions of content liability. MAPS carries general liability insurance.
- **Amendments:** Changes, alterations, or additions to this agreement may be made if agreed to in writing between both the Town of Gorham 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 80 Hazard Mitigation Plans, more than 75 Emergency Operations Plans and has completed the following FEMA courses in emergency 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:**

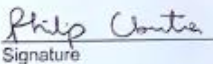
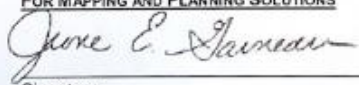
For Mapping & Planning Solutions

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

Philip Cloutier
Fire Chief & EMD
Gorham Fire Department
347 Main Street
Gorham, NH 03581
(603) 466-2549


Signatures below indicate acceptance of and agreement to details outlined in this agreement.

<p><u>FOR THE TOWN OF GORHAM, NH</u></p> <p> Signature</p> <p>Philip Cloutier Fire Chief/EMD Printed Name/Title</p> <p>12-29-2020 Date</p>	<p><u>FOR MAPPING AND PLANNING SOLUTIONS</u></p> <p> Signature</p> <p>June Garneau, Owner December 28, 2020</p>
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Signatures are scanned facsimiles; original signatures are on file.

B. APPROVED PENDING ADOPTION (APA) FROM FEMA





HMP Approvable Pending Adoption (APA) Notice: Gorham, NH




Neiderbach, Josiah <josiah.nei

To pcloutier@gorhamnh.org


Cc jgarneau@mappingandplanning.com; Surette, Melissa; FEMA-R1-MitigationPlans; **+3 others**

Thu 4:35 PM



This message was sent with High importance.



Gorham NH APA Review.docx 101 KB

Reference: Adoption Required to Finish Local Mitigation Plan Process

Dear Official:

The FEMA Region 1 Mitigation Division has determined the *Gorham Hazard Mitigation Plan Update 2024* meets all applicable FEMA Mitigation Planning requirements (Local Mitigation Planning Policy Guide, effective April 19, 2023), except its adoption by: Town of Gorham, NH.

This status is "Approvable Pending Adoption" (APA). Plan adoption is required to receive formal FEMA approval.

Local governments, including special districts, with a plan status of "Approvable Pending Adoption" are not eligible for FEMA mitigation grant programs with a mitigation plan requirement.

The next step in the approval process is to formally adopt the mitigation plan and send a resolution or adoption documentation in accordance with Element F1 of the [Local Mitigation Planning Policy Guide](#) on pages 31-32, to the State for submission to FEMA. A sample adoption resolution can also be found in Appendix B of the Policy Guide.

It is critical for the jurisdiction to adopt the plan as soon as possible. Jurisdictions that adopt the plan more than one year after APA status has been issued must either:

- Validate that their information in the plan remains current with respect to both the risk assessment (no recent hazard events, no changes in development) and their mitigation strategy (no changes necessary); or
- Make the necessary updates before submitting the adoption resolution to FEMA.

An approved local mitigation plan, including adoption by the local government, is one of the conditions for applying for and/or receiving FEMA mitigation grants from the following programs:

- Building Resilient Infrastructure and Communities (BRIC)
- Flood Mitigation Assistance (FMA)
- Hazard Mitigation Grant Program (HMGP)
- HMGP Post-Fire
- If applicable, High Hazard Potential Dams Grant Program (HHPD)

If a plan does not meet the HHPD requirements, then the jurisdiction is not eligible for assistance from the HHPD Grant Program. If any jurisdiction with HHPDs is interested in this assistance, they should contact the FEMA Regional Mitigation Planner listed below to learn more about how to include all dam risks in the plan, or at least their portion of the plan.

We look forward to receiving the adoption resolution/documentation soon and discussing options for implementing this mitigation plan. If we can assist in any way, please contact Jay Neiderbach at 202-285-7769 and josiah.neiderbach@fema.dhs.gov.

Sincerely,

Jay

Josiah (Jay) Neiderbach, Mitigation Planner
Floodplain Management and Insurance Branch | Mitigation Division | DHS / FEMA, Region I
M: 202.285.7769 E: josiah.neiderbach@fema.dhs.gov

Attachment: FEMA Local Mitigation Plan Review Tool

Signatures are scanned facsimile; original signatures are on file.

C. FORMAL APPROVAL LETTER FEMA

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INSERTION OF FINAL APPROVAL LETTER FROM
FEMA

Signatures are scanned facsimile; original signatures are on file.

D. SIGNED CERTIFICATE OF ADOPTION

CERTIFICATE OF ADOPTION

GORHAM, NH

SELECT BOARD

A RESOLUTION ADOPTING THE GORHAM, NH HAZARD MITIGATION PLAN UPDATE 2024

WHEREAS, the Town of Gorham 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 Gorham has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2023 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between September 8, 2021, and April 13, 2022, regarding the development and review of the Hazard Mitigation Plan Update 2023 and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Gorham 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 Gorham 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 Gorham;
2. The respective officials identified in the mitigation action items of the Plan are hereby directed to pursue the implementation of the recommended actions assigned to them;

Gorham, 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. The Emergency Management Director shall present an annual report to the Select Board on the progress of the Plan's action items.

Adopted this day, the 26th of March, 2024

Select Board Chair

Yves Zornio
Signature

Yves Zornio
Print Name

Member of the Select Board

Judith LeBlanc
Signature

Judith LeBlanc
Print Name

Member of the Select Board

Mike Waddell
Signature

Mike Waddell
Print Name

Emergency Management Director

Philip Cloutier
Signature

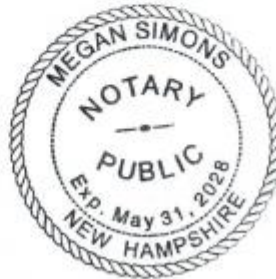
Philip Cloutier
Print Name

IN WITNESS WHEREOF, the undersigned has affixed their signature and their notary stamp having witnessed the signing of this document on this day, 03/26, 2024

Megan Simons
Notary

05/31/2028
Expiration

03/26/2024
Date



Signatures are scanned facsimile; original signatures are on file.

E. CWPP APPROVAL LETTER FROM DNCR

**Gorham, NH
A Resolution Approving the
Gorham, NH Hazard Mitigation Plan Update 2024
As a Community Wildfire Protection Plan**

Several public and committee meetings were held between September 8, 2021, and April 13, 2022, regarding developing and reviewing the Gorham Hazard Mitigation Plan Update 2024. The Gorham Hazard Mitigation Plan Update 2024 contains potential future projects to mitigate hazard and wildfire damage in the Town of Gorham.

The Fire Chief/Emergency Management Director and the Select Board desire that the Department of Natural and Cultural Resources (DNCR) accept this plan as a Community Wildfire Protection Plan, having adhered to its requirements.

The Select Board and the Fire Chief/Emergency Management Director approve the Gorham Hazard Mitigation Plan Update 2024 and understand that with approval by DNCR, this Plan will also serve as a Community Wildfire Protection Plan.

For the Town of Gorham

APPROVED and SIGNED this day, Mar. 25, 2024.


Chairman of the Select Board

Yves Zornio
Printed Name


Fire Chief/ Emergency Management Director

Philip Cloutier
Printed Name

For the Department of Natural & Cultural Resources (DNCR)

APPROVED and SIGNED this day, _____, 2024.

Forest Ranger – NH Division of Forest and Lands, DNCR

APPROVED and SIGNED this day, _____, 2024.

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

Signatures are scanned facsimile; original signatures are on file.

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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 hearings, the Town’s governing body and the designated Emergency Management Director shall execute this page annually.

Gorham, 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 2024 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 hearings, the Town's governing body and the designated Emergency Management Director shall execute this page annually.

Gorham, 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 2024 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 hearings, the Town's governing body and the designated Emergency Management Director shall execute this page annually.

Gorham, 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 2024 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 hearings, the Town's governing body and the designated Emergency Management Director shall execute this page annually.

Gorham, 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 2024 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)*
 - *Hazard mitigation Grant Program Post Fire (HMGMP-Post Fire)*
 - *Flood Mitigation Assistance (FMA)*
 - *Building Resilient Infrastructure and Communities (BRIC)*
 - *Pre-Disaster Mitigation (PDM)*
- 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**
 - Gorham Hazard Mitigation Plan, 2016
 - Carroll Hazard Mitigation Plan, 2023
 - Madison Hazard Mitigation Plan, 2023
 - 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, October 2022; Community Response for Gorham, Received, 8/19/2022, Census 2000 and Revenue Information derived from this site;
 - <http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Gorham.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: HAZARD MITIGATION ASSISTANCE (HMA)

The Federal Emergency Management Agency's (FEMA's) HMA programs promote funding for mitigation measures that reduce or eliminate long-term risk to people and property from future disasters. These programs allow communities across the nation to enhance mitigation and take steps that will foster greater resilience and reduce disaster suffering³⁷:

HAZARD MITIGATION GRANT PROGRAM (HMGP)

HMGP provides funding to rebuild communities in a way that mitigates future disaster losses in those communities. Funding is made available after the President issues a major disaster declaration. It is based on up to 15% or 20% of the estimated federal assistance provided.

HAZARD MITIGATION GRANT PROGRAM POST FIRE(HMGP POST FIRE)

The HMGP Post Fire program provides funding after a Fire Management Assistance Grant (FMAG) is declared, and helps communities implement hazard mitigation measures after wildfire disasters. State, local tribal, and territorial governments are eligible to apply for funding. The funding amount is pre-calculated and based on historical FMAG declarations and is reassessed every fiscal year.

FLOOD MITIGATION ASSISTANCE (FMA)

FMA is a competitive grant program that provides funding to states, local communities, tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program (NFIP). The program is funded by an annual congressional appropriation and since 2016 has made \$160 million available for mitigation projects.

HMA Eligible Activities

MITIGATION PROJECTS	HMGP	HMGP POST FIRE	BRIC	FMA
Property Acquisition	Yes	Yes	Yes	Yes
Structure Elevation	Yes	Yes	Yes	Yes
Mitigation Reconstruction	Yes	Yes	Yes	Yes
Flood Risk Reduction Measures	Yes	Yes	Yes	Yes
Dry Floodproofing Non-Residential Buildings	Yes	Yes	Yes	Yes
Tsunami Vertical Evacuation	Yes	Yes	Yes	–
Safe Rooms Construction	Yes	Yes	Yes	–
Wildfire Mitigation	Yes	Yes	Yes	–
Retrofitting	Yes	Yes	Yes	Yes
Generators	Yes	Yes	Yes	–
Earthquake Early Warning System	Yes	Yes	Yes	–
CAPABILITY AND CAPACITY BUILDING				
New Plan Creation and Updates	Yes	Yes	Yes	Yes
Planning-Related Activities	Yes	Yes	Yes	Yes
Project Scoping/ Advance Assistance	Yes	Yes	Yes	Yes
Financial Technical Assistance	–	–	–	Yes

Note: The table above is not an exhaustive list of eligible activities. Please see program guidance or Notice of Funding Opportunity (NOFO) for more information on eligible activities.

³⁷ https://www.fema.gov/sites/default/files/documents/fema_hma-trifold_2021.pdf; sections of this appendix are taken directly from this Hazard Mitigation Assistance flier, although not all sections are quoted

BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES (BRIC)

BRIC is a competitive grant program that provides funding for mitigation projects to reduce the risks from disasters and natural hazards. The amount of funding is based on a 6% set-aside of the assistance FEMA provides following major disaster declarations through the Public Assistance and Individuals and Households Program. The BRIC program was designed to foster innovation and provides a yearly grant cycle, offering applicants a consistent source of funding.

PRE-DISASTER MITIGATION (PDM)

PDM is a grant program that helped state, local, tribal, and territorial governments plan and implement hazard mitigation projects. For 20 years, PDM funded mitigation projects, but in FY 2020 BRIC replaced PDM for any new funding. Any grant awarded in FY 2019 will continue to be managed under PDM for any new funding.

ROLES OF APPLICANTS AND SUBAPPLICANTS

Mitigation project subapplications are developed by local governments (subapplicants) and submitted to their state, territory, or tribal government (applicant). States, territories, and tribes are responsible for selecting the subapplications that align with their mitigation priorities and submit these in an application to FEMA. FEMA conducts a final eligibility review of all subapplications to ensure compliance with federal regulations. For competitive mitigation grants, FEMA will select projects for funding. All HMA grants have programmatic and administration requirements that are the responsibility of the applicant and subapplicant.

ADDITIONAL RESOURCES

For general questions about the HMA programs, please contact your State Hazard Mitigation Officer or FEMA Region. Other resources are available; see the Hazard Mitigation Assistance flier, FEMA, or go to www.fema.gov/hazard-mitigation-assistance.³⁸

Who is eligible to apply?

APPLICANTS	HMGP	HMGP POST FIRE	BRIC	FMA
State/territorial agencies	Yes	Yes	Yes	Yes
Federally recognized tribes	Yes	Yes	Yes	Yes

SUBAPPLICANT	HMGP	HMGP POST FIRE	BRIC	FMA
State agencies	Yes	Yes	Yes	Yes
Federally recognized tribes	Yes	Yes	Yes	Yes
Local governments/ communities	Yes	Yes	Yes	Yes
Private nonprofit organizations	Yes	Yes	–	–

Cost-share requirements

PROGRAM	COST SHARE*
HMGP	75 / 25
HMGP Post Fire	75 / 25
BRIC	75 / 25
BRIC (Economically Disadvantaged Rural Communities**)	90 / 10
FMA (Community Flood Mitigation, Project Scoping, Individual Mitigation of Insured Properties, and Planning Grants)	75 / 25
FMA (Repetitive loss properties)	90 / 10
FMA (Severe repetitive loss properties)	100 / 0

* Percent of federal/non-federal cost share

** Economically Disadvantaged Rural Communities" is synonymous with small impoverished communities as used in the Stafford Act.

³⁸ https://www.fema.gov/sites/default/files/documents/fema_hma-trifold_2021.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 winter and can cause loss of life, property damage, and tree damage.

Snowstorms

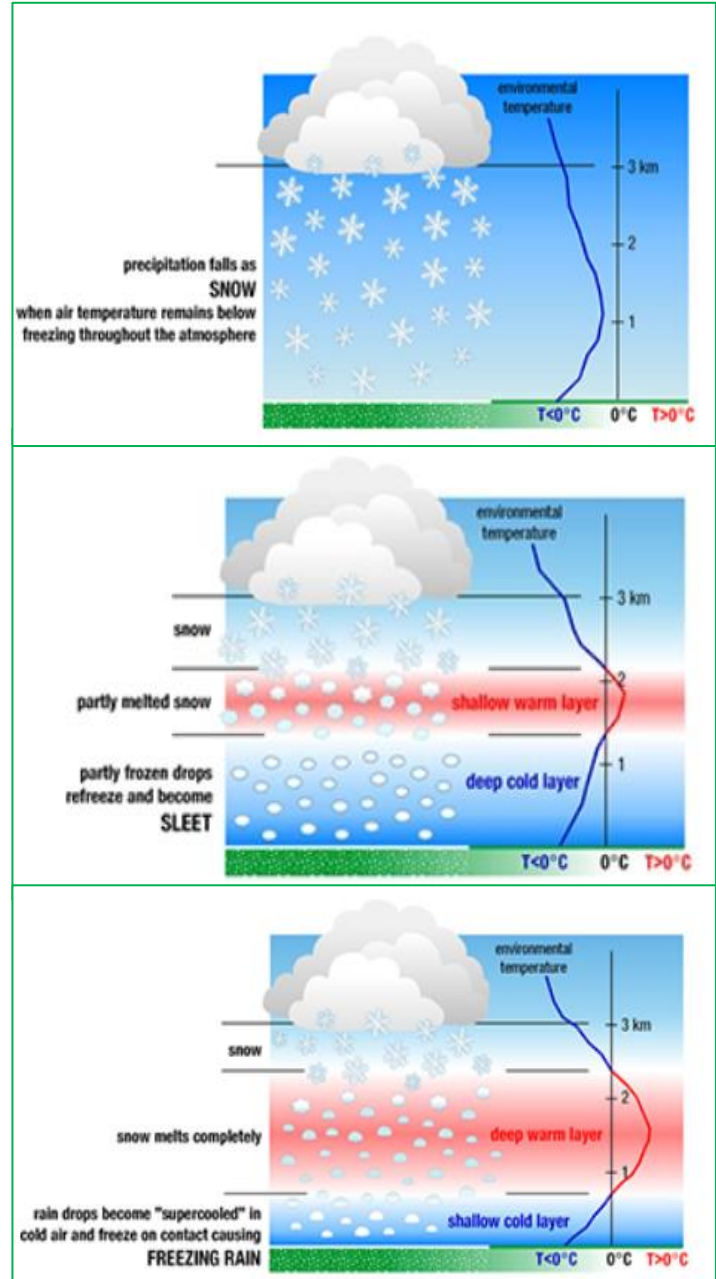
A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow for 12 hours or six inches for 24 hours.

Sleet

Snowflakes melt as they fall through a small band of warm air and 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 and 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 accumulates ice on roads, trees, utility lines, and other objects, resulting in an "ice storm". "Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires, and similar objects."³⁹



NOAA – National Severe Storms Laboratory

³⁹ 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.⁴⁰

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	

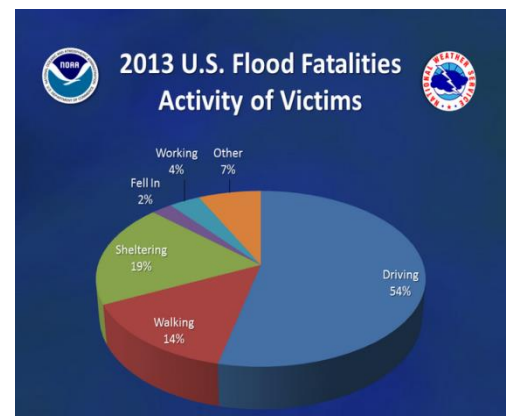
(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

*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 increased rainfall and snowmelt; however, floods can occur anytime. 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.



⁴⁰ The Weather Channel, <http://www.weather.com/news/weather-winter/rating-ice-storms-damage-sperry-piltz-20131202>

Flooding (Dam Failure)

Flooding because of dam failure can be small enough 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 water held by the dam. The size of the breach, the amount of water flowing from the dam, and the amount of human habitation downstream are also factors.

A "Dam" means any artificial barrier, including appurtenant works, which impounds or diverts water, has a height of 4 feet or more, or a storage capacity of two acres or more, or is located at the outlet of a great pond⁴¹. 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 manner⁴²:

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 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

⁴¹ NH DES http://des.nh.gov/organization/divisions/water/dwgb/wrpp/documents/primer_chapter11.pdf

⁴² <http://des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf>

Flooding (local, road erosion)

Today, the risk of flooding is a serious concern with changes in land use, aging roads, and designs that are no longer effective and undersized culverts. 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. Using “1% annual chance of flood” is more accurate. Flooding is often associated with hurricanes, heavy rains, ice jams, and rapid snowmelt in the spring.

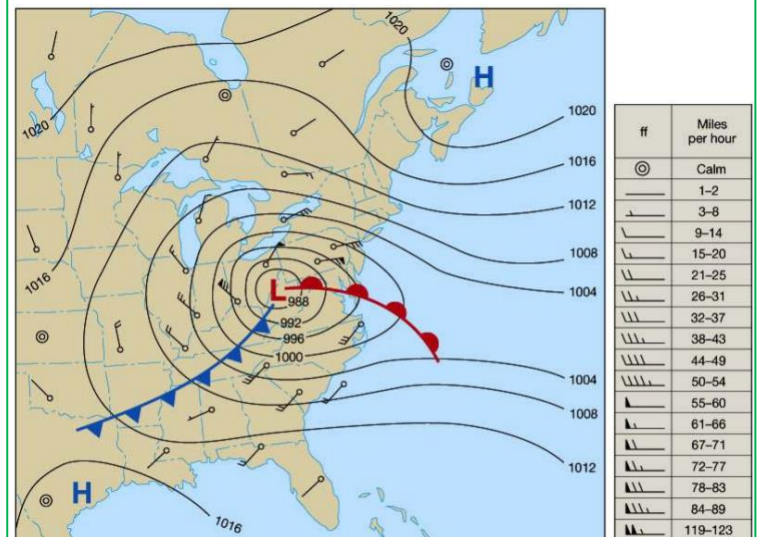
*HIGH WIND EVENTS

Windstorm

NOAA (National Oceanic & Atmospheric Administration) stated that wind is “*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.^{43 44}

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.

⁴³ NOAA; <http://www.nws.noaa.gov/glossary/index.php?letter=w>

⁴⁴ 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 to form 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 become a force of destruction if they touch down.

Tornadoes produce the most violent winds on earth at 280 mph or more speeds. 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 can 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.”⁴⁵ 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 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.

⁴⁵ 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 and lasting 5 to 30 minutes. Damaging winds, causing widespread, tornado-like damage, could be as high as 134 MPH.⁴⁶

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.⁴⁷

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 begin 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, the 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	

⁴⁶ NOAA - <http://www.srh.noaa.gov/jetstream/tstorms/wind.html>

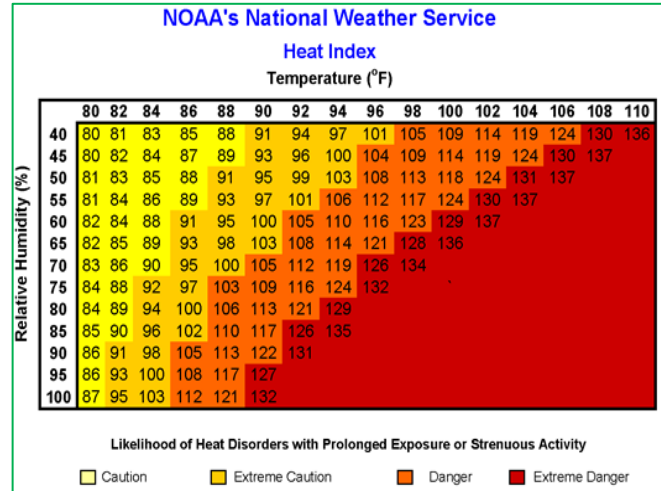
⁴⁷ NOAA, Storm Prediction Center, <http://www.spc.noaa.gov/faq/tornado/beaufort.html>

*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.

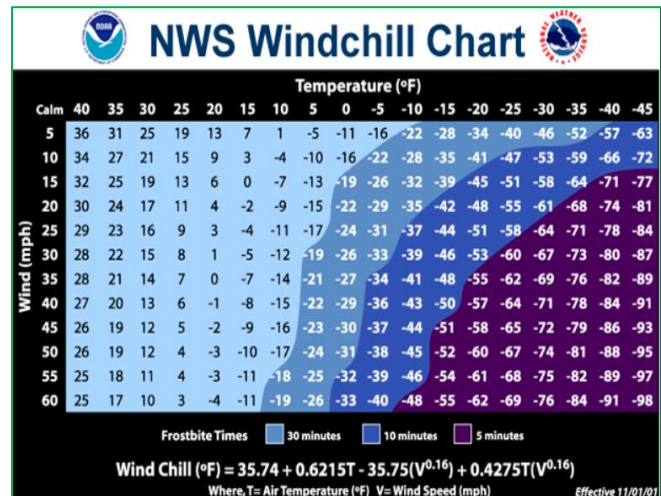
Most heat disorders occur when a victim is overexposed to heat or has over-exercised for their age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.



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 a prolonged heat wave than those 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."⁴⁸ The chart above explains the likelihood of heat disorders that may result from high heat.⁴⁹

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 dangerous; it can bring on health emergencies in susceptible people without shelter, those who are stranded or live in poorly insulated homes or without heat.⁵⁰ The National Weather Service Chart (to the right) shows windchill due to wind and temperature.⁵¹



⁴⁸ NOAA, Index/Heat Disorders; <http://www.srh.noaa.gov/ssd/html/heatwv.htm>

⁴⁹ NOAA; <http://www.nws.noaa.gov/os/heat/index.shtml>

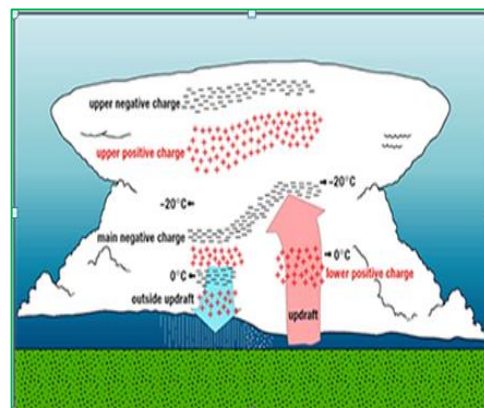
⁵⁰ CDC; <http://www.bt.cdc.gov/disasters/winter/guide.asp>

⁵¹ National Weather Service; <http://www.nws.noaa.gov/om/windchill/>

LIGHTNING & HAIL*Lightning**

The NOAA National Severe Storms Laboratory (NSSL) stated, “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.”⁵²

Thunder, a result of lightning, is created when the “lightning channel heats the air to around 18,000 degrees Fahrenheit...”⁵³ 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, outbuildings, 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 and late afternoon or early evening; 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 annually 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.”⁵⁴

⁵² NOAA National Severe Storms Laboratory, <https://www.nssl.noaa.gov/education/svrwx101/lightning>

⁵³ Ibid

⁵⁴ Ibid

Hailstorm

Lightning Activity Level (LAL) Grid

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

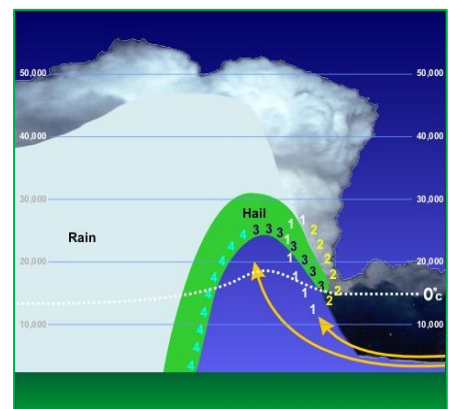
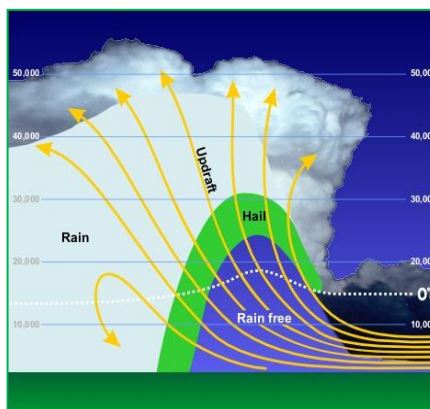
LAL	Cloud & Storm Development	Lightning Strikes 15 Minutes
1	No thunderstorms	-
2	Cumulus clouds are common, but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. 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."⁵⁵

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

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.⁵⁶ The charts to the right show how hail is formed.⁵⁷



⁵⁵ NOAA National Severe Storms Laboratory; <https://www.nssl.noaa.gov/education/svrwx101/hail/>

⁵⁶ <http://www.pinterest.com/pin/126171227030590678/>

⁵⁷ <http://oceanservice.noaa.gov/education/yos/resource/JetStream/tstorms/hail.htm#hail>

*WILDFIRES

The National Wildfire Coordinating Group (NWCG) states that wildfires are designated into seven categories, as seen in the top chart to the right.⁵⁸ For statistical analysis, the US Forest Service recognizes the cause of fires according to the bottom chart to the right:⁵⁹

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 defines the Wildland Urban Interface (WUI) area as *“that geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels.”*⁶⁰

There are two major potential losses with a wildfire: the forest 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 page⁶¹) 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.”⁶²

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

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

⁵⁸ <http://www.nwcg.gov/pms/pubs/glossary/s.htm>

⁵⁹ https://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?5109.14

⁶⁰ International Wildland-Urban Interface Code, 2012, International Code Council, Inc.

⁶¹ National Hurricane Center; <http://www.nhc.noaa.gov/aboutsshws.php>

⁶² National Hurricane Center, NOAA; <http://www.nhc.noaa.gov/aboutsshws.php>

Rainfall from tropical storms has been reported at up to 6 inches per hour; 43 inches of rain in 24 hours was reported in Alvin, TX, due to Tropical Storm Claudette.⁶³

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, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles will likely result in power outages that could last 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, blocking 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 by losing most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles will be 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. An earthquake's underground point of origin is called its focus; the point on the surface directly above the focus is the epicenter. Two scales, the Richter Scale (which measures strength or magnitude) and the Mercalli Scale (which measures intensity or severity), determine the magnitude and intensity of an earthquake. 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.⁶⁴

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

⁶³ http://www.wpc.ncep.noaa.gov/research/mcs_web_test_test_files/Page1637.htm

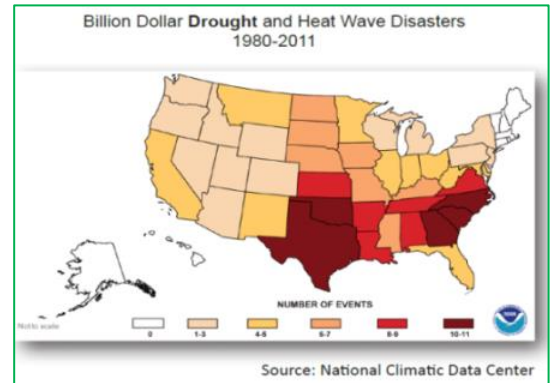
⁶⁴ Modified Mercalli Scale/Richter Scale Chart; MO DNR, http://www.dnr.mo.gov/geology/geosrv/geores/richt_mercalli_relation.htm

***DROUGHT**

A drought is a long period of abnormally low precipitation that adversely affects the growing season or living conditions of plants and animals. Droughts are rare in New Hampshire. They are generally less damaging and disruptive than 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 surges, 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.⁶⁵

While no universally accepted standard or scientific scale has been developed for measuring the severity of all landslides, severity can be measured in 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.⁶⁶

***INFECTIOUS DISEASES**

Bacterial & Viral Infections

Many organisms live inside our bodies and on our skin. Although these organisms are generally harmless and sometimes 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.⁶⁷

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.⁶⁸

⁶⁵ Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013

⁶⁶ State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 & <https://oas.org/dsd/publications/Unit/oea66e/ch10.htm>

⁶⁷ <https://www.mayoclinic.org/diseases-conditions/infectious-diseases/symptoms-causes/syc-20351173>

⁶⁸ <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.”⁶⁹

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 has infected 672,165,995 people and caused the deaths of 6,847,466 individuals worldwide as of February 8, 2023. As of this date, confirmed cases in the US were reported to be 1,246,697, with 1,112,300 reported deaths.⁷⁰ 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 February 2023, 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 follows⁷¹:

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

⁶⁹ <https://www.webmd.com/a-to-z-guides/bacterial-and-viral-infections#1>

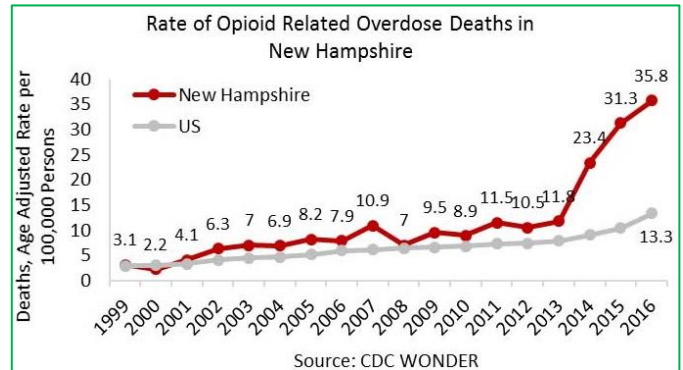
⁷⁰ <https://coronavirus.jhu.edu/map.html>

⁷¹ <https://www.cdc.gov/ophs/csels/dsepd/ss1978/lesson1/section11.html>

Opioid Crisis

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.”

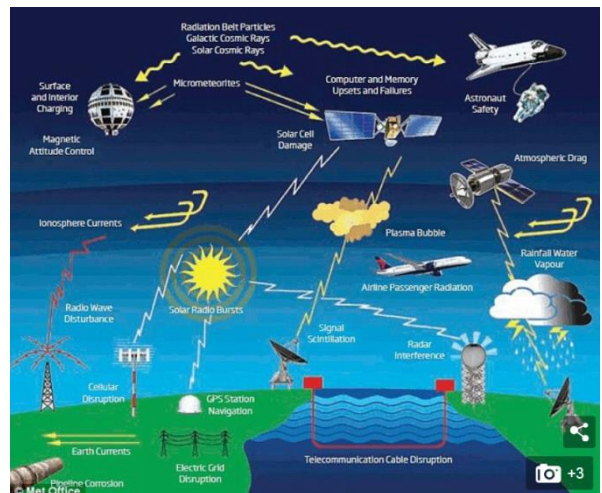
According to the National Institute on Drug Abuse, “New Hampshire has the second highest rate of opioid-related overdose deaths – a rate of 35.8 deaths per 100,000 persons – nearly 3 times higher than the national rate of 13.2 deaths per 100,000. From 1999 through 2016, opioid-related deaths in New Hampshire 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.”⁷² The chart to the right shows the increase in opioid-related overdose deaths in New Hampshire compared to the US overall.⁷³



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, disrupting navigation, 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.⁷⁴



⁷² <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-summaries-by-state/new-hampshire-opioid-summary>

⁷³ Ibid

⁷⁴ <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 Extent⁷⁵

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 is sporadic, satellite navigation is degraded for hours, low-frequency radio navigation is 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 are 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

⁷⁵ 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 a 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 are 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. There may be 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 blackouts 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 errors in positioning for one to two hours. Minor disruptions of satellite navigation are 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 are 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. Most avalanches tend to happen during winter, particularly from December to April. However, avalanche fatalities have been recorded for every month of the year.”⁷⁶



“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 recreationists 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.				

An avalanche has three main parts (see the 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.”⁷⁷

The second part is the “avalanche track”, or the downhill path 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 stopped 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.”⁷⁸

⁷⁶ Copyright Richard Armstrong, NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>

⁷⁷ NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>; image credit: Betsy Armstrong

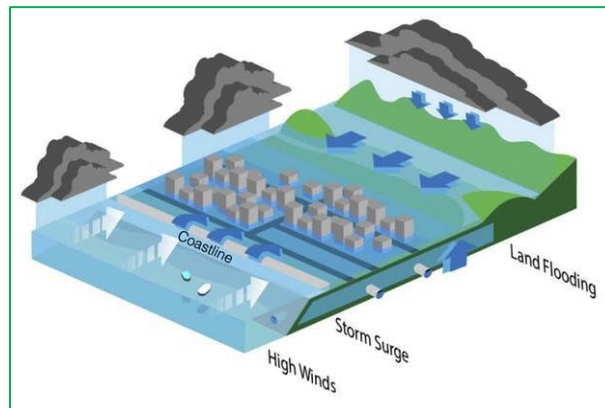
⁷⁸ Copyright Richard Armstrong, NSIDC, <http://nsidc.org/cryosphere/snow/science/avalanches.html>

When an avalanche is possible, 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 determined by likelihood, size, and distribution.⁷⁹

COASTAL FLOODING

Coastal areas are particularly susceptible to flooding, erosion, storm surge, and sea-level rise due to tropical and post-tropical cyclones, heavy rain events, 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.”⁸⁰

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.”⁸¹ As shown in the image below, storm surge and inland flooding can affect the severity of flooding along the shore.⁸²



⁷⁹ http://www.avalanche.org/danger_card.php

⁸⁰ NH Multi-hazard Mitigation Plan-2018, page 55

⁸¹ Ibid

⁸² 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 Storms	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 Storms	March 14-15, 2017	Belknap & Carroll	Major Disaster Declaration DR-4316: Severe winter storm and snowstorm in Belknap & Carroll Counties; disaster aid was provided to supplement state and local recovery efforts.
FM-5123	Forest Fire	April 21-23, 2016	Cheshire	Fire Management Assistance Declaration, FM-5123: Stoddard, NH

Number	Hazard	Date of Event	Counties	Description
DR-4209	Severe Winter Storms	January 26-28, 2015	Hillsborough, Rockingham & Stafford	Major Disaster Declaration DR-4209: Severe winter storm and snowstorm in Hillsborough, Rockingham, and Stafford Counties; disaster aid was provided 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 occurred from 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 from 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, bringing NH high winds, power outages, and heavy rain. 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, in 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: An emergency Declaration was declared 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 occurred May 26th-30th, 2011, in Coos & Grafton Counties (Memorial Day Weekend Storm).
DR-1913	Severe Storms & Flooding	March 14-31, 2010	Hillsborough & Rockingham	Major Disaster Declaration DR-1913: Flooding in two NH counties occurred, 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 began on September 6, 2008.
DR-1787	Severe Storms & Flooding	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	Major Disaster Declaration DR-1787: Severe storms, a tornado, and flooding occurred on July 24, 2008.

Number	Hazard	Date of Event	Counties	Description
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: State and federal disaster assistance reached more than \$3 million to help residents and business owners in New Hampshire recover from losses from 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 the 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
COGCON	Continuity of Government Readiness Conditions	NERF	Non-Emergency Response Facility
COOP	Continuity of Operations	NFIP	National Flood Insurance Program
CPCC	Continuity Policy Coordination Committee	NGVD	National Geodetic Vertical Datum of 1929
CWPP	Community Wildfire Protection Plan	NIMS	National Incident Management System
DBHRT	Disaster Behavioral Health Response Team	NOAA	National Oceanic and Atmospheric Association
DEMD	Deputy Emergency Management Director	NRP	National Response Plan
DES	Department of Environment Services	NSPD	National Security Presidential Directive
DFO	Disaster Field Office	NTAS	National Terrorism Advisory System Nuclear and Explosive
DHHS	Department of Health and Human Services	NWS	National Weather Service
DHS	Department of Homeland Security	PA	Public Assistance
DMCR	Disaster Management Central Resource	PDA	Preliminary Damage Assessment
DBEA	Department of Business & Economic Affairs	PDD	Presidential Decision Directive
DNCR	Department of Natural & Cultural Resources	PIO	Public Information Officer
DOD	Department of Defense	PMEF	Primary Mission Essential Function
DOE	Department of Energy	POD	Point of Distribution
DOJ	Department of Justice	PPE	Personal Protective Equipment
DOT	Department of Transportation	PR	Potential Resources
DPW	Department of Public Works	PSA	Public Service Announcement
DRC	Disaster Recovery Center	RERP	Radiological Emergency Response Plan
EAS	Emergency Alert System	RNAT	Rapid Needs Assessment Team
EMD	Emergency Management Director	SERT	State Emergency Response Team
EMS	Emergency Medical Services	SITREP	Situation Report (Also SitRep)
EO	Executive Order	SNS	Strategic National Stockpile
EOC	Emergency Operations Center	SOG	Standard Operating Guidelines
EPA	U.S. Environmental Protection Agency	SOP	Standard Operating Procedures
EPZ	Emergency Planning Zone	SPNHF	Society for the Protection of NH Forests
ERF	Emergency Response Facility	UC	Unified Command
ERG	Emergency Relocation Group	USDA-FS	US Department of Agriculture – Forest Service
ESF	Emergency Support Functions	USGS	United States Geological Society
FEMA	Federal Emergency Management Agency	VOAD	Volunteer Organization Active in Disasters
FIRM	Flood Insurance Rate Map	WMD	Weapon(s) of Mass Destruction
FPP	Facilities & Populations to Protect	WMNF	White Mountain National Forest
GIS	Geographic Information System	WUI	Wildland Urban Interface
HazMat	Hazardous Material(s)		
HFRA	Healthy Forest Restoration Act		
HMGP	Hazard Mitigation Grant Program		
HSAS	Homeland Security Advisory System		

APPENDIX F: POTENTIAL MITIGATION IDEAS⁸³

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 Floodproof 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

⁸³ 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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Gorham in winter

Photo Credit: Meagan P, Town of Gorham

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