Sugar Hill, NH

Hazard Mitigation Plan Update 2024

SUGAR HILL

This Plan integrates the following:

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

April 10, 2024
Final for Town Adoption

Prepared for the Town of Sugar Hill and NH Homeland Security & Emergency Management
By
The Sugar Hill Hazard Mitigation Planning Team

With assistance from Mapping and Planning Solutions

"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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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)
- NH Forests & Lands (DNCR)
- White Mountain National Forest (WMNF)

This Plan is an update to the most recent Sugar Hill Hazard Mitigation Plan, approved on August 1, 2017.
This Plan was funded under the Building Infrastructure & Communities Grant Program (BRIC2020)

Approval Notification Dates for 2024 Update

Approved Pending Adoption (APA)..... April 9, 2024
Jurisdiction Adoption:..... _____ __, 2024
CWPP Approval:..... _____ __, 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 SUGAR HILL HAZARD MITIGATION PLANNING TEAM (HMPT)

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

- Mike Ho Sing Loy..... Sugar Hill Police Chief & EMD
- Jennifer Gaudette .... Sugar Hill AA
- Doug Glover..... Sugar Hill Road Agent
- Margo Connors ..... Sugar Hill Select Board, Chair
- Chris Elms ..... Sugar Hill Select Board, Member
- Richard Bielefield..... Sugar Hill Select Board, Member
- Allan Clark..... Sugar Hill Fire Chief
- Zina Schmidt ..... PC, NCPHN
- Jennifer Gilbert..... NH OSI
- Lynne Doyle ..... 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. Sugar Hill 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
AA ..... Administrative Assistant
PC, NCPHN ..... Preparedness Coordinator, North Country Public Health Network

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Executive Summary

The Sugar Hill Hazard Mitigation Plan Update 2024 was compiled to assist the Town in reducing and mitigating future losses from natural and other hazardous events. The Plan was developed by the Sugar Hill 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.

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This Plan is an **update** to the 2017 Sugar Hill Hazard Mitigation Plan. To produce an accurate and current planning document, the HMPT used the 2017 plan as a foundation, building upon that plan to provide more timely information.

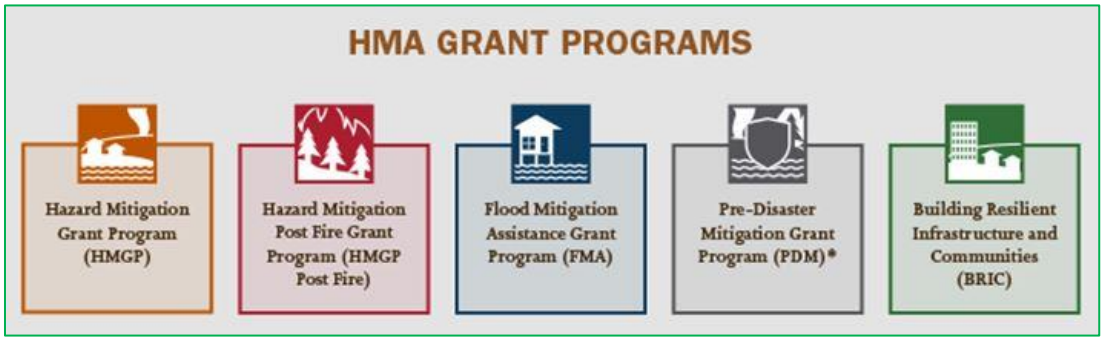
Mitigation action items for natural hazards are the main focus of this Plan; NH Homeland Security & Emergency Management (HSEM) determined the natural hazard when writing the 2023 NH Hazard Mitigation Plan. However, this Plan addresses technological and human-caused hazards in addition to natural hazards, as shown below.

NATURAL HAZARDS – AS DETERMINED BY NH HSEM AND THE TOWN

1) Inland Flooding
2) High Wind Events
3) Severe Winter Weather
4) Infectious Disease
5) Lightning
6) Wildfire
7) Extreme Temperatures
8) Drought
9) Tropical/Post Tropical Cyclones
10) Earthquake

TECHNOLOGICAL & HUMAN-CAUSED HAZARDS

1) Long-Term Utility Outage
2) Aging Infrastructure
3) Known & Emerging Contaminants
4) Cyber Events
5) Mass Casualty Incidents
6) Transport Accidents
7) Terrorism & Violence



Some hazards listed in the 2023 NH Hazard Mitigation Plan were not included in this Plan as the Team felt they were unlikely to occur in Sugar Hill 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 Sugar Hill 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:

Sugar Hill Hazard Mitigation Plan Update 2024	the Plan or this Plan
Sugar Hill	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 Sugar Hill 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 Sugar Hill 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 International Organization for Standardization (ISO) rating may be improved.

Chapter 1: Hazard Mitigation Planning Process

A. AUTHORITY & FUNDING

The Sugar Hill 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 Sugar Hill 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 Sugar Hill 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 Sugar Hill, Grafton 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 USDA-Forest Service to consider local communities as they develop and implement forest management and hazardous fuel reduction projects. However, a community must 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; https://www.govinfo.gov/content/pkg/BILLS-108hr1904enr/pdf/BILLS-108hr1904enr.pdf

E. PUBLIC & STAKEHOLDER INVOLVEMENT

Public and stakeholder involvement was stressed during the initial meeting, and community officials were given a matrix of potential team members (see below). Community officials were urged to contact as many people as possible to participate in the planning process, including residents, officials, and residents from surrounding communities. The Town of Sugar Hill 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 Sugar Hill. A press release (see below) was posted on the Town Hall Bulletin Board, in the Sugar Hill Newsletter several times, on the Town's website, and on the Town's calendar. The press release was used to notify 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. Sugar Hill has no colleges or universities.

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

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Press Release

FOR IMMEDIATE RELEASE
Updated: April 24, 2023

Contact: June Garneau
603-991-9664

THE TOWN OF SUGAR HILL COMMENCES HAZARD MITIGATION PLANNING

The Sugar Hill Police Chief/Emergency Management Director met with June Garneau of Mapping and Planning Solutions to begin work on the required five-year update to the **2017 Sugar Hill Hazard Mitigation Plan**. The town and Mapping and Planning Solutions are conducting hazard mitigation meetings to develop the plan over the next few months.

During these public meetings, the planning team will address natural, technological, and human-caused hazards such as Inland Flooding, Long-Term Utility Outages, and Transport Accidents; the team will also determine "Action Items" to help mitigate the effects of these hazards. 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.

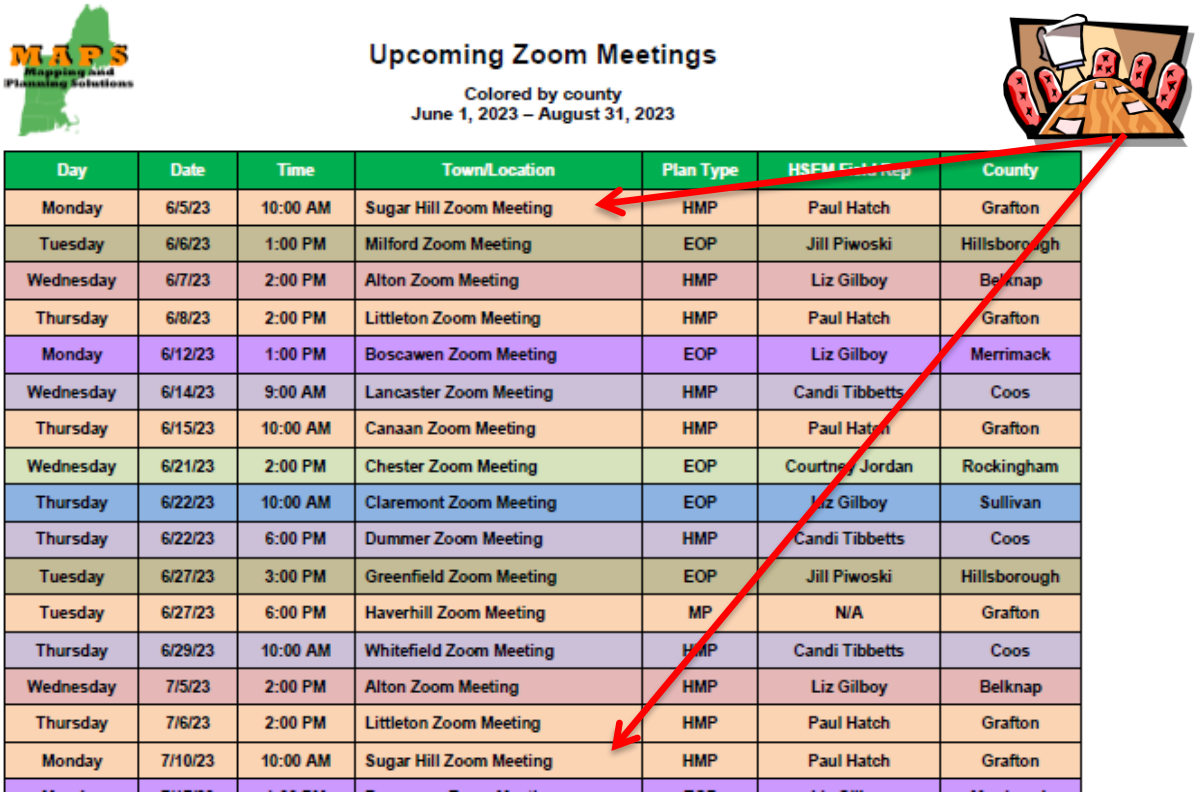
As mandated by the Disaster Mitigation Act of 2000, all municipalities must complete a local Hazard Mitigation Plan to qualify for Federal Emergency Management Administration funding should a natural disaster occur. The planning processes are made possible by grants from FEMA.

The hazard mitigation planning team is currently being formed. Sugar Hill citizens and any interested stakeholders are invited to participate. The next meeting is scheduled for **Monday, May 1, 2023, from 10:00 to 12 PM** via "Zoom". The public is encouraged to attend all meetings. All interested parties should contact Chief Ho Sing Loy, Sugar Hill Police Chief, by emailing policechief@sugarhillnh.org to be included in the process; interested parties will be added to the Zoom meeting invitation list. Future meetings are planned for June 5, July 10, and August 14

More information on the hazard mitigation planning process is available from June Garneau at Mapping and Planning Solutions, jgarneau@mappingandplanning.com.

The Town of Sugar Hill commences hazard mitigation planning Sugar Hill_HMP_PressRelease

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. Sugar Hill's neighbors, Lisbon, Bethlehem, Franconia, Easton, and Landaff, are part of MAPS' monthly email.



Day	Date	Time	Town/Location	Plan Type	HSEM Field Rep	County
Monday	6/5/23	10:00 AM	Sugar Hill Zoom Meeting	HMP	Paul Hatch	Grafton
Tuesday	6/6/23	1:00 PM	Milford Zoom Meeting	EOP	Jill Piwoski	Hillsborough
Wednesday	6/7/23	2:00 PM	Alton Zoom Meeting	HMP	Liz Gilboy	Belknap
Thursday	6/8/23	2:00 PM	Littleton Zoom Meeting	HMP	Paul Hatch	Grafton
Monday	6/12/23	1:00 PM	Boscawen Zoom Meeting	EOP	Liz Gilboy	Merrimack
Wednesday	6/14/23	9:00 AM	Lancaster Zoom Meeting	HMP	Candi Tibbetts	Coos
Thursday	6/15/23	10:00 AM	Canaan Zoom Meeting	HMP	Paul Hatch	Grafton
Wednesday	6/21/23	2:00 PM	Chester Zoom Meeting	EOP	Courtney Jordan	Rockingham
Thursday	6/22/23	10:00 AM	Claremont Zoom Meeting	EOP	Liz Gilboy	Sullivan
Thursday	6/22/23	6:00 PM	Dummer Zoom Meeting	HMP	Candi Tibbetts	Coos
Tuesday	6/27/23	3:00 PM	Greenfield Zoom Meeting	EOP	Jill Piwoski	Hillsborough
Tuesday	6/27/23	6:00 PM	Haverhill Zoom Meeting	MP	N/A	Grafton
Thursday	6/29/23	10:00 AM	Whitefield Zoom Meeting	HMP	Candi Tibbetts	Coos
Wednesday	7/5/23	2:00 PM	Alton Zoom Meeting	HMP	Liz Gilboy	Belknap
Thursday	7/6/23	2:00 PM	Littleton Zoom Meeting	HMP	Paul Hatch	Grafton
Monday	7/10/23	10:00 AM	Sugar Hill Zoom Meeting	HMP	Paul Hatch	Grafton

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 town planning.

The Emergency Management Director (EMD)/Police Chief, the Administrative Assistant, and the Road Agent participated in meetings. The EMD met with other community leaders to discuss the hazard mitigation plan, tracking their hours as part of the match. 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 one from the general public attended. The North Country Public Health Network Emergency Preparedness Coordinator attended one meeting.

§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 Sugar Hill Hazard Mitigation Plan 2017 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 Sugar Hill Hazard Mitigation Plan 2017	Compare & Contrast
Sugar Hill Annual Report (2022)	Fire Report & Development
Other Hazard Mitigation Plans (Hanover, Greenland, Enfield)	Formats & Mitigation Ideas
The Sugar Hill Subdivision Regulations (2023)	New Development Regulations
The Sugar Hill Site Plan Review Regulations (2015)	Commercial Regulations
The Sugar Hill Zoning Ordinance (2022)	Zoning Regulations
Floodplain Development Ordinance	Floodplain Regulations
Census 2020 Redistricting Data	Population Data
The NH DRA Summary of Inventory of Valuation MS-1 2023 for Sugar Hill	Structure Evaluation
The Economic & Labor Market Information Bureau Community Profile	Population Trends
The American Community Survey (ACS2021, 201-2021)	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.

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 2023.[4] These goals below have been modified for grammatical purposes but are otherwise quoted directly from the State plan.

OVERARCHING GOALS

1. Minimize loss and disruption of human life, property, the environment, and the economy due to natural hazards and high-hazard potential dam failure through a coordinated and collaborative efforts between federal, state, and local authorities to implement appropriate and cost-effective hazard mitigation measures.
2. Enhance the protection of the general population, citizens, and guests of the State before, during, and after a hazard event through public education about disaster preparedness and resilience and expanded awareness of the threats and hazards that face the State.
3. Promote comprehensive hazard mitigation planning at state and local levels to encourage data integration, alignment of plans, and identification of funding and other resources.
4. Identify how climate change impacts natural hazards and mitigation strategies.
5. Strengthen the Continuity of Operations and Continuity of Government across the state and local levels to ensure the continuation of essential services through training, outreach, and education.
6. Promote equity by challenging state agencies and municipalities to incorporate whole community concepts during the planning and execution of mitigation projects, encouraging the identification and inclusion of vulnerable populations in the planning process.

NATURAL HAZARD OBJECTIVES

1. Reduce long-term risks through assessment, identification, and strategic mitigation of at risk/vulnerable infrastructure (high hazard potential and other dams, stream crossings, roadways, coastal levees, etc.)
2. Minimize illnesses and deaths related to events that present a threat to human and animal health
3. Assist communities with plan development, outreach, and public education in order to reduce the impact from natural disasters
4. Ensure mitigation strategies consider the protection and resiliency of natural, historical, and cultural resources.
5. Effectively collaborate between federal, State, and local agencies as well as private partners, NGOs, and VOADs
6. Ensure that grant related funding processes allow for expedient and effective actions to take place at the Community and State-level

TECHNOLOGICAL AN HUMAN-CAUSED HAZARD OBJECTIVES

The State recognizes that technological and human-caused hazards are important to consider at the state and local level. The State and local jurisdictions must prepare to respond to and monitor for these types of hazards. As such, they will remain included in this Plan as an Annex for reference purposes. Strategies and action items for these hazards will not be included in this Plan so that the focus can remain on natural hazards.

[4] New Hampshire State Hazard Mitigation Plan, 2023 Update; https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2023/10/2023-NH-State-Hazard-Mitigation-Plan-Signed-10.5.23.pdf

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 cross-talk regarding natural, technological, and human-cause 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 – Capabilities Assessment

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 for APA (Approved Pending Adoption)

Step 12: Adopt and monitor the Plan

I. HAZARD MITIGATION BUILDING BLOCKS & TABLES

The foundation for this mitigation plan was the previous plan; each completed table had its starting point with the last hazard mitigation plan completed by the Community.

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.

HAZARD MITIGATION PROCESS
THE BUILDING BLOCKS

HAZARD IDENTIFICATION & RISK ASSESSMENT (HIRA)
WHAT ARE THE HAZARDS AND WHICH ARE MOST LIKELY TO IMPACT SUGAR HILL?
TABLE 3.1

CRITICAL INFRASTRUCTURE & KEY RESOURCES (CIKR)
ARE ANY CIKR IN HARM'S WAY?
TABLES 4.1-4.4

CAPABILITIES ASSESSMENT
DO ANY CAPABILITIES NEED IMPROVEMENT? TABLE 6.1

WILDLAND URBAN INTERFACE (WUI)
WHAT ARE THE WILDFIRE RISKS THROUGHOUT SUGAR HILL?
HAZARD DESCRIPTIONS

HISTORIC HAZARD INDENTIFICATION
WHAT AREAS OF SUGAR HILL ARE THE HARDEST HIT?
TABLE 3.2

ACCOMPLISHMENTS SINCE THE LAST PLAN
WERE STRATEGIES COMPLETED OR SHOULD THEY BE DELETED OR DEFERRED TO THIS PLAN?
TABLE 7.1

MITIGATION ACTION ITEMS
WHAT CAN WE DO TO LESSEN, DIMINISH OR ELIMINATE THE RISK OF HAZARDS?
WHAT PROBLEMS ARE WE TRYING TO SOLVE?
TABLE 9.1 – THE END GOAL

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 2017 Sugar Hill Hazard Mitigation Plan review. Using the 2017 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 2017 plan, strategies from the past were reassessed and improved upon for the future.

The following narrative explains how the 2017 Sugar Hill Hazard Mitigation Plan was used during each step of the planning process to make revisions that resulted in this Plan.

PRELIMINARY MEETING 1, APRIL 17, 2023

A preliminary virtual meeting of the Sugar Hill Hazard Mitigation Team was held on April 17, 2023. Meeting attendance included Mike Ho Sing Loy (Police Chief & EMD), Jennifer Gaudette (Administrative Assistant), Olin Garneau (Planner, Mapping & Planning Solutions), and June Garneau (Planner, Mapping & Planning Solutions).

This preliminary meeting was set to discuss the process needed to update the hazard mitigation plan and to set a course of action. Team building was part of this discussion, and it was determined that developing a "Team" that could attend six to eight meetings was unrealistic in Sugar Hill.

In place of team meetings, the EMD agreed to a hybrid approach to the hazard mitigation process, as the Sugar Hill EMD in the past had also done. The EMD agreed to reach out individually to those who needed to be involved and track the time spent obtaining the answers to questions needed for this Plan. As part of the process, small team meetings would also be held to recap the process's current status and incorporate what is needed for plan compliance. In addition, the Zoom link to these small meetings was posted on the Town's website to encourage other town officials, stakeholders, and the general public to attend these meetings if possible.

Meeting 1 – May 1, 2023

1) Preliminary Meeting
- a) Discussed…
  - i) The planning process, purpose, funding & collaboration
  - ii) Community Involvement & Stakeholders
  - iii) The hybrid planning process

2) Today's Topics
- a) Review…
  - i) Table 2.1, Town Statistics
- b) Work on…
  - i) Hazard Descriptions
  - ii) Table 3.2, Historic Hazard Identification
  - iii) Tables 4.1-4.4, Critical Infrastructure & Key Resources

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

4) Future Meetings
- a) Monday, June 5, 2023, @ 10:00 AM
- b) Monday, July 10, 2023, @ 10:00 AM
- c) Monday, August 14, 2023, @ 10:00 AM

MEETING 1, MAY 1, 2023

The first virtual meeting of the Sugar Hill Hazard Mitigation Team was held on May 1, 2023. Meeting attendance included Mike Ho-Sing-Loy, Jennifer Gaudette, Doug Glover (Road Agent), Olin Garneau, and June Garneau.

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. [5]

[5] Documents emailed to the team before the first meeting: agenda, process, acronyms & abbreviations, goals, work record, and 2018 state hazards

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 get them later.

Next on the agenda was *Table 3.1, Hazard Identification & Risk Assessment (HIRA)*. 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[6].

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..... What is the probability of death or Injury?
The Property Impact..... What is the probability of physical losses and damages?
The Business Impact..... What is the probability of interruption of service?
The Probability..... What is the 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. Ten natural hazards, three technological hazards, and four human-caused hazards were identified. After analyzing the natural hazards in Table 3.1, Inland Flooding, High Wind Events, and Severe Winter Weather were designated "Very High" risk natural hazards for the Town.

Having completed Table 3.1, the Team started working on descriptions of each hazard and how they could impact the Community.

To gain more knowledge of the impact of these hazards, the Planner asked the Team to describe each hazard as it relates to Sugar Hill. 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, functional needs, and other vulnerable populations 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 information to analyze the impact of the hazards on the Community. The Planner noted that these descriptions would be used in Chapter 5.

The Team began work on *Table 3.2, Historic Hazard Identification*, which lists past and potentially hazardous locations and events. This table had been prepopulated with information from past hazard mitigation plans, Major Disaster Declarations (DRs), and Emergency Declarations (EMs) reported by FEMA that have occurred statewide, specifically in Grafton County. The Team described the events during each disaster in Sugar Hill in each instance.

[6] The 2023 State Hazard Mitigation Plan had not been adopted

Lastly, the Team worked on *Tables 4.1–4.4, Critical Infrastructure & Key Resources (CIKR)*. The Emergency Response Facilities (ERFs), the Non-Emergency Response Facilities (NERFs), the Facilities & Populations to Protect (FPPs), and the Potential Resources (PRs) from the 2017 plan were examined. A few minor adjustments were made for this Plan. In addition, the evacuation routes, helicopter landing zones, and bridges on the evacuation routes were discussed. Lastly, each Critical Infrastructure & Key Resource was analyzed for their "Hazard Risk" (see Chapter 4).

With time running out, the Planner thanked the Team for their work and assigned homework to team members, requesting that the Road Agent prepare a list of road and culvert projects that should be completed within the next five years. The next meeting was scheduled for Monday, June 5, 2023.

MEETING 2, JUNE 5, 2023

Virtual meeting attendance included Mike Ho-Sing-Loy, Jennifer Gaudette, Doug Glover, Olin Garneau, and June Garneau.

Meeting 2 – June 5, 2023

1) Last Meeting
- a) Reviewed…
  - i) Table 2.1, Town Statistics
- b) Worked on…
  - i) Hazard Descriptions
  - ii) Table 3.2, Historic Hazard Identification
  - iii) Tables 4.1-4.4, Critical Infrastructure & Key Resources

2) Today's Topics
- a) Review…
  - i) Table 3.2, Historic Hazard Identification
  - ii) Tables 4.1-4.4, Critical Infrastructure & Key Resources
- b) Work on…
  - i) Table 7,1, Accomplishments since the Prior Plan
  - ii) Table 6.1, Capabilities Assessment

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

4) Future Meetings
- a) Monday, July 10, 2023, @ 10:00 AM
- b) Monday, August 14, 2023, @ 10:00 AM

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 data was accurate. 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 Planner then reviewed Table 3.2, Historic Hazard Identification, to ensure all past hazards were identified. The final review was *Table 4.1-4.4, Critical Infrastructure & Key Resources*. The Team felt these tables were accurate; therefore, no changes were made.

The Planner then took some time to discuss development trends in the Town and how the Wildland Urban Interface (WUI) affects the Town. The Team noted a few development projects, but most were smaller projects not in hazard-prone areas. The Planner then explained the WUI to the Team. The WUI is where the urban environment interfaces with the wildland environment and is the most prone to the risk of wildfires. In Sugar Hill, 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 citizens about wildfire risk.

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 2017 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.*

Table 7.1, Accomplishments since the Last Plan, pre-populated with data from the 2017 plan, was the next 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 2017 plan had been completed or partially completed by the Town. Some were deleted as they were no longer useful or considered emergency preparedness, not mitigation. Still, others were deferred for consideration as new action items for this Plan. The Planner promised to translate her notes into paragraphs to review at the next meeting.

The Planner showed virtual handouts 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 Sugar Hill (see right).

Link to explore – FEMA Mitigation Ideas:

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

With time running out, the Planner reviewed what would occur at the next meeting and thanked the Team. The next meeting was set for July 10, 2023.

MEETING 3, JULY 10, 2023

Virtual meeting attendance included Mike Ho-Sing-Loy, Jennifer Gaudette, Doug Glover, Olin Garneau, and June Garneau.

First, the Team reviewed Table 6.1 to ensure that the comments and ideas expressed by the Team were fully represented. Work on this table resulted in new action items for this Plan, some of which are also in Table 7.1.

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 additional items from Table 7.1 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.

Meeting 3 – July 10, 2023

1) Last Meeting
- a) Reviewed…
  - i) Table 3.2, Historic Hazard Identification
  - ii) Tables 4.1-4.4, Critical Infrastructure & Key Resources
- b) Worked on…
  - i) Table 7,1, Accomplishments since the Prior Plan
  - ii) Table 6.1, Capabilities Assessment

2) Today's Topics
- a) Review…
  - i) Table 7,1, Accomplishments since the Prior Plan
  - ii) Table 6.1, Capabilities Assessment
- 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) Monday, August 14, 2023, @ 10:00 AM

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 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 handouts shown by the Planner, 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.

Although most of Tables 8.1 and 9.1 were complete, there were a few action items to discuss at the next meeting, as well as the ranking and prioritizing of each action item. The Planner displayed one last document that explained the ranking and prioritizing methodology (Chapter 9, Section A).

The Planner explained to the Team what would occur during the next meeting on August 14, 2023, and the meeting was adjourned.

MEETING 4 – AUGUST 14, 2023

Virtual meeting attendance included Mike Ho-Sing-Loy, Jennifer Gaudette, Doug Glover, Zina Schmidt (North Country Regional Public Health Network), Olin Garneau, and June Garneau.

Meeting 4 – August 14, 2023

1) Last Meeting
- a) Reviewed…
  - i) Table 7,1, Accomplishments since the Prior Plan
  - ii) Table 6.1, Capabilities Assessment
- b) Worked on…
  - i) Table 9.1, Mitigation Action Plan
  - ii) STAPLEE

2) Today's Topics
- a) Work on…
  - i) Table 9.1, Mitigation Action Plan
  - ii) STAPLEE
  - iii) Ranking & Priority (time allowing)

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

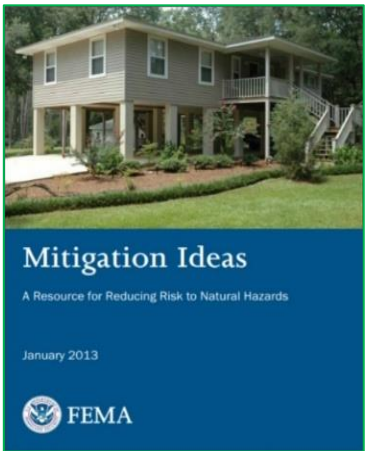
4) Future Meetings
- a) _____

The meeting began where we had left off in Tables 9.1 and 8.1. After considering each strategy forwarded from Tables 6.1 and 7.1, the Team considered additional mitigation items, some the Planner had suggested from other plans and some provided by the Team at an earlier meeting. After much discussion and a careful review, the Team ultimately settled on twenty-eight "Mitigation Action Items" that they felt were achievable and could help diminish the impact of natural hazards in the future.

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. The action items were placed in four categories, as shown in Chapter 9, Section A, and assigned a priority within each category. For example, if seven action items were ranked in the A category, the priority ranks were A-1 to A-7. The pre-ranked action items were shown to the Team using a digital presentation to enable the Team to see the action items, determine any changes needed, and adjust the rank. In this fashion, the Team determined which action items were the most important within their rank and in which order they would be accomplished.

With the completion of Tables 8.1 and 9.1, the Team's work was complete, except for the final review and adoption. No additional meetings were scheduled. The Planner agreed to prepare the draft plan and email a copy for review. The Planner explained the process from this point forward and thanked the Team for their hard work.

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.



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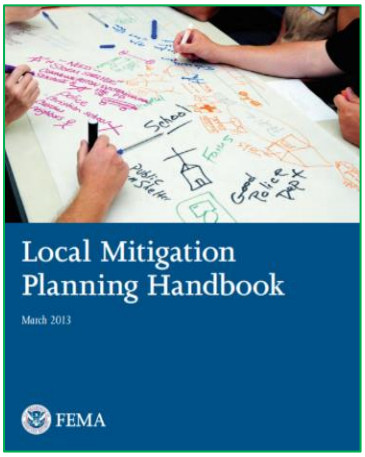
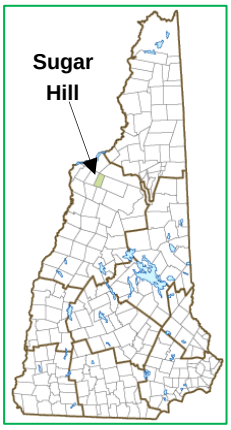


https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-planning-handbook_03-2013.pdf

Chapter 2: Community Profile

A. INTRODUCTION



Sugar Hill is a beautiful community in Grafton County in northwest New Hampshire. Located in the "White Mountains" tourist region of New Hampshire, wonderful mountain vistas can be seen throughout the Community. Sugar Hill is bordered to the east by Franconia, to the south by Easton and Landaff, to the north by Bethlehem, and to the west by Lisbon. Sugar Hill is known as one of the most bucolic and idyllic communities in the North Country and for its annual "Lupine Festival" in June.

TOWN GOVERNMENT

A three-member Board of Selectmen governs the Town of Sugar Hill. The Town's departments include but are not limited to Fire, Police, Highway, Planning, Zoning, Library, and Conservation. Although not host to large commercial facilities, Sugar Hill has several tourist-related facilities and home businesses. Working members of the Community commute to larger nearby communities such as Littleton, Franconia, Bethlehem, and Lisbon.

DEMOGRAPHICS & HOUSING

Sugar Hill's population has increased from 454 in 1990 to 652 in 2020, showing a forty-year increase of 198, according to the US Census 2020.[7] This data represents a growth rate of approximately 43.6%.

There are an estimated 384 housing units; 282 are occupied, and 102 are vacant, thus confirming the presence of second homes.[8] The estimated median household income is $125,500, and the median age is 60.4 years.[9]

EDUCATION & CHILD CARE

Sugar Hill students in grades PK-6 attend school at the Lafayette Regional School in Franconia with students from the neighboring towns of Easton and Franconia. Students in grades 7-12 attend the Profile School in Bethlehem, along with students from Franconia, Easton, and Bethlehem. There are no colleges, universities, or licensed childcare facilities in Sugar Hill, according to the Community Profile provided by the Economic & Labor Market Information Bureau.

Incorporated: 1962

Origin: This town was part of the 1768 charter of Gunthwaite, which was renamed Lisbon in 1824. Though settled about 1789, this town is New Hampshire's youngest, incorporated in 1962. After considerable litigation, it was carved out of Lisbon to be an independent voting unit. The name Sugar Hill comes from a large grove of sugar maples in the hills. In 1929, Austrian Sig Buchmayr established the first organized ski school in the United States near Peckett's-on-Sugar Hill, one of the earliest resorts to promote winter vacationing.

Villages and Place Names: unknown

Population, Year of the First Census Taken: 336 residents in 1970

Population Trends: Sugar Hill was incorporated in 1962, and the first Census for the town was in 1980. Since then, population change totaled 260, from 397 in 1980 to 657 in 2021. The largest decennial percent change was a 24 percent increase between 1990 and 2000. The 2021 Census estimate for Sugar Hill was 657 residents, which ranked 208th among New Hampshire's incorporated cities and towns.

Population Density and Land Area, 2022 (US Census Bureau): 39.0 persons per square mile of land area. Sugar Hill contains 17.1 square miles of land area and 0.1 square miles of inland water area.

Source: Economic & Labor Market Information Bureau, NH Employment Security, October 2023; Received 7/12/2023

[7] US Census 2020
[8] 2020 DEC Redistricting Data
[9] American Community Survey (ACS 2022) 5-Year Estimate Data

NATURAL FEATURES

Sugar Hill covers approximately 17.1 square miles of land area and 0.1 square miles of inland water. The Village of Sugar Hill is located atop Sugar Hill Ridge, where spectacular views are seen in virtually every direction. The mountains and hills of the White Mountains dominate the entire community. The highest peak is Bronson Hill at 2,078' above sea level.

Sugar Hill is home to the annual Lupine Festival and some of the most beautiful fall foliage vistas. The elevation in the Village is approximately 1,325' above sea level. Most of the Community is over 1,000 feet above sea level, leaving it vulnerable to ice storms.

Vegetation is typical of northern New England, including deciduous and conifer forests, open fields, swamps, and riverine areas. The mountainous terrain lends itself to many small streams, brooks, and rivers, most notably the Gale River, Salmon Hole Brook, Indian Brook, and Bowen Brook. Two small ponds can also be found in Sugar Hill: Streeter Pond and Coffin Pond.

TRANSPORTATION

Three major roadways run through Sugar Hill: NH Route 117 travels from Franconia on the eastern side of the Sugar Hill Ridge to Lisbon on the western side; NH Route 18 travels from Bethlehem in the north and through a small portion of Sugar Hill until it reaches Franconia and travels further south to Franconia Notch State Park; and Interstate 93 roughly parallels NH Route 18 but is not accessible in Sugar Hill. The remainder of Sugar Hill's roadways are long, narrow, and winding country roads that are beautiful in the spring, summer, and fall but can be treacherous during winter.

Interstate 93 carries tremendous traffic, with a good deal of commercial traffic coming and going to Canada. NH Routes 117 and 18 are also well-traveled by tourists, commuting residents, and commercial vehicles.

B. EMERGENCY SERVICES

EMERGENCY OPERATIONS CENTER & EMERGENCY MANAGEMENT DIRECTOR

The Town of Sugar Hill 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 Sugar Hill, the designated EOC is the Town Office.

FIRE DEPARTMENT & EMS

The Sugar Hill Fire Department is a paid-on-call fire department providing quality fire service to the residents and visitors of Sugar Hill 24 hours a day, 365 days a year. The department staffs a part-time Chief and approximately 22 paid-on-call firefighters and operates one station within the Community. The Sugar Hill Fire Department participates with the Twin State Mutual Fire Aid Association and other area departments. Littleton Fire Rescue and the Sugar Hill Fire Department provide emergency medical services. Littleton Fire Rescue provides emergency medical transportation.

POLICE DEPARTMENT

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

PUBLIC WORKS

The Sugar Hill Highway Department operates as needed year-round, 24 hours daily. The department staffs a full-time Road Agent, two full-time and one part-time employee. The department's mission is to support the citizens of Sugar Hill through the safe operation, proper maintenance, and future development of highways, supporting infrastructure and utilities cost-consciously without sacrificing quality. The department belongs to the NH Public Works Mutual Aid Association.

MEDICAL FACILITIES

Sugar Hill's closest medical facility is Littleton Regional Healthcare in Littleton (12 miles, 25 beds). Alternative medical facilities are Weeks Medical Center in Lancaster (27.7 miles, 25 beds) and Cottage Hospital in Woodsville (17.6 miles, 25 beds).

EMERGENCY SHELTER(S)

The primary shelter is where evacuees are directed during an emergency. Sugar Hill's designated primary shelter is the Town Office, which offers a large sleeping area, restrooms, showers, and kitchen facilities. It has a permanent generator to keep the building operational during power outages. The designated secondary shelter for the Town is the Sugar Hill Fire Station.

C. SUGAR HILL'S CURRENT & FUTURE DEVELOPMENT TRENDS

Nearly every New Hampshire community experienced a significant drop in new home construction after the Great Recession of 2008. Sugar Hill was no exception. Between 2008 and 2014, single-family new home construction in Sugar Hill dropped to three or fewer yearly. From 2015 to 2021, there has been a steady increase in new single-family construction, with a peak in 2021, as shown in the chart (see right) from City-Data.com[10]. The Sugar Hill Planning Board reported in the 2022 Annual Report that activity for 2022 included two lot line adjustments, two minor subdivisions, and one site plan review (Event Venue)."[11]

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 for those wishing to flee the cities. Lot line adjustments and minor subdivisions were also quite common. Then, real estate boomed, at least during 2021 and through most of 2022, only to settle to more moderate levels by the fall.

Single-family new house Construction building permits

- 2021: 7 buildings, average cost: $642,900
- 2020: 3 buildings, average cost: $788,300
- 2019: 4 buildings, average cost: $413,800
- 2018: 2 buildings, average cost: $850,000
- 2017: 5 buildings, average cost: $751,000
- 2016: 2 buildings, average cost: $417,500
- 2015: 6 buildings, average cost: $241,600
- 2013: 3 buildings, average cost: $358,300
- 2012: 3 buildings, average cost: $358,300
- 2011: 3 buildings, average cost: $286,700
- 2010: 3 buildings, average cost: $163,300
- 2009: 2 buildings, average cost: $370,000
- 2008: 3 buildings, average cost: $370,000
- 2007: 6 buildings, average cost: $201,300
- 2006: 12 buildings, average cost: $221,30(
- 2005: 6 buildings, average cost: $332,000
- 2004: 7 buildings, average cost: $239,300
- 2003: 7 buildings, average cost: $239,300
- 2002: 8 buildings, average cost: $198,100
- 2001: 5 buildings, average cost: $191,000
- 2000: 4 buildings, average cost: $127,500
- 1999: 4 buildings, average cost: $148,800
- 1998: 9 buildings, average cost: $171,900
- 1997: 8 buildings, average cost: $171,900

[10] City-Data.com; http://www.city-data.com/city/Sugar Hill-New-Hampshire.html
[11] Town Sugar Hill, 2022 Annual Report, Planning Board Report, page 37

The Sugar Hill Planning Board's process for all subdivision and site plan applications is extensive. It involves on-site examinations and the expertise of other departments and commissions as appropriate. Local regulations are designed to meet state regulations and maintain the Community's local character. Sugar Hill's regulations address wetland areas, stormwater flow, and fire protection. Regulations require all large subdivisions and commercial enterprises to address water availability, and the planning mechanisms that are in place require adequate fire protection to be installed. New development approval requires 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.

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 Building Inspector, and the Select Board will monitor and guide growth and development using the Master Plan, Subdivision Regulations, the Site Plan Review process, and the Zoning Ordinance. Building permits are required.

As a small community, the Building Inspector, the Planning Board, the Select Board, 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.

TABLE 2.1: TOWN STATISTICS

Table 2.1 - Town Statistics				
Census Population Data	**2020**	**2010**	**2000**	**1990**
Sugar Hill, NH - Census Population Data	**647**	**563**	**564**	**454**
Grafton County	**91,118**	**89,118**	**81,826**	**74,998**
30-year Growth Rate	42.51%	*Growth Rate = 2020POP-1990POP/1990POP*		
Elderly Population-% over 65 (2022 ACS 5-Year)	30.3%			
Median Age (2022 ACS 5-Year)	60.4			
Median Household Income (2022 ACS 5-Year)	$124,500			
Poverty Rate (2022 ACS 5-Year)	6.3%			
Change in Population-Summer (%)	100%			
Change in Population-Winter (%)	100%			
Housing Statistics *(2022 ACS 5-Year)*				
Total Housing Units	449			
Occupied Housing Units	252			
Vacant Housing Units	197			
Total Parcels Per Avitar (assessing software)	438			
Assessed Building Values				
Types buildings	**Value**		**1% Damage**	**5% Damage**
Residential	$106,975,490		$1,069,755	$5,348,775
Manufactured Housing	$94,000		$940	$4,700
Commercial	$3,710,700		$37,107	$185,535
Discretionary Preservation Easement	$21,310		$213	$1,066
Tax Exempt	$1,443,300		$14,433	$72,165
Utilities	$3,000,600		$30,006	$150,030
Totals	$115,245,400		$1,152,454	$5,762,270

The above chart shows the 2023-MS1 structure values. These values estimate structure loss due to natural hazards (see Chapter 5) based on a loss of 0-1% or 1-5% of structures in the Community—source: Town of Sugar Hill.

Table 2.1 - Town Statistics	
Regional Coordination	
County	Grafton
Tourism Region	White Mountains
Municipal Services & Government	
Town Hall or Town Offices	Town Office
Town Manager or Administrator	No
Select Board (3-member)	Yes, elected
Planning Board	Yes, appointed
School Board	Yes, representatives on Lafayette and Profile School Boards
Zoning Board of Adjustment	Yes, elected
Conservation Commission	Yes, appointed
Master Plan	Yes, currently being updated
Emergency Operation Plan (EOP)	Yes, September 14, 2020
Hazard Mitigation Plan (HMP)	Yes, August 1, 2017
Zoning Ordinances	Yes, March 2022
Subdivisions Regulations	Yes, reviewed annually
Site Plan Review Regulations	Yes, 2015
Capital Improvement Plan (CIP)	Yes, reviewed annually
Capital Reserve Funds (CRF)	Yes, reviewed annually
Building Permits Required	Yes
International Residential Codes	Yes (follow State codes for all others)
Town Web Site	Yes, www.sugarhillnh.org
Floodplain Ordinance	Yes, 2007 (standalone)
National Flood Insurance Program (NFIP) Member	Yes, April 2, 1986
Flood Insurance Rate Maps (DFIRMs)	February 20, 2008
Flood Insurance Rate Study (FIS)	February 20, 2008
Percent of Local Assessed Valuation by Property Type - 2022 ***(NH Department of Revenue)***	
Residential Buildings	94.8%
Commercial Land & Buildings	2.9%
Other (including Utilities)	2.3%
Emergency Services	
Town Emergency Warning Systems	Genasys (formerly CodeRED/NH ENS)
School Emergency Warning System	Alert Solutions
Emergency Page	No
Facebook Pages	Town, Fire Department & Police Department
Other Social Media	No
ListServ	No
Newsletter	Town of Sugar Hill, Constant Contact Newsletter, sent to residents twice a month.
Local Newspapers	Littleton Courier & The Caledonia Record
Public Access TV	No
Local TV Stations	WMUR Channel 9 & WCAX Channel 3
Local Radio Stations	WLTN 96.7 FM
Police Department	Yes, full-time Chief, one full-time and two part-time officers
Police Dispatch	Grafton County Dispatch
Police Mutual Aid	NH State Police - Troop F, Grafton County Sheriff's Office, and surrounding town's police departments

Table 2.1 - Town Statistics	
Animal Control Officer	No, the Police Department handles
Fire Department	Yes, part-time Chief and 22 paid-on-call firefighters
Fire Dispatch	Grafton County Dispatch
Fire Mutual Aid	Twin State Fire Mutual Aid
Fire Stations	One
Fire Warden	Yes
Emergency Medical Services (EMS)	Sugar Hill Fire Department & Littleton Fire Rescue
EMS Dispatch	Grafton County Dispatch
Emergency Medical Transportation	Littleton Fire Rescue
HazMat Team	Contact the State Fire Marshal or HSEM
Established Emergency Management Director (EMD)	Yes
Established Deputy EMD	Yes
Line of Succession (if EMD is unavailable)	1st…DEMD (Fire Chief)
	2nd…Town Administration (Select Board)
	3rd…Road Agent
Public Health Network	North Country Regional Public Health Network
Health Officer	Yes
Deputy Health Officer	Yes
Building Inspector	Yes
Established Public Information Officer (PIO)	No
Nearest Hospital	Littleton Regional Healthcare, Littleton (12 miles)
Primary EOC	Town Office (generator)
Secondary EOC	Fire Department (generator)
Primary Shelter	Town Office (generator)
Secondary Shelter	Fire Station (generator)
Household Pet Shelter	Town Office (generator)
Large Animal & Livestock Shelter	No
Local Humane Society & Veterinarians	Companion Pet Care & Littleton Area Veterinary Urgent Care
Utilities	
Town Sewer	Private septic
Highway Department	Yes, full-time Road Agent, two full-time and one part-time
Miles of Class V Roads	32.5 paved, 3.5 gravel, 36 total miles (one way)
NH Public Works Mutual Aid	Yes
Water Supply	Private wells
Wastewater Treatment Plant	No
Electric Supplier	Eversource Energy & NH Electric Coop
Natural Gas Supplier	None
Cellular Telephone Access	Limited
Solar Arrays	Highway Garage has full solar and is carrying "credit" Exemptions are provided for personal solar projects.
Pipelines	No
Gas lines	No
High-Speed Internet	Limited; expected to be improved in 2024
Telephone Company	Consolidated Communications & Spectrum

Table 2.1 - Town Statistics	
Transportation	
Primary Evacuation Routes	NH Route 117 south to NH Route 18 NH Route 117 north to US Route 302 Bickford Hill Road to NH Route 116 Interstate 93 -Accessible from other towns
Secondary Evacuation Routes	Center District Road to Crane Hill Road to Streeter Pond Road Streeter Pond Road to US Route 302 South Road to Lafayette Road to NH Route 116 Easton Road to NH Route 116
Nearest Interstate	I-93, Exit 38 (4 miles)
Nearest Airstrip	Franconia Airport, Franconia (2,305 ft. turf runway)
Nearest Commercial Airport(s)	Lebanon Municipal Airport, Lebanon (64 miles)
	Manchester-Boston Regional, Manchester (99 miles)
Public Transportation	No
Railroad	No
Education & Childcare	
Elementary Schools	Grades K-6 are part of Lafayette Regional with Easton & Franconia
Middle/High Schools	Grades 7-12 are part of Profile with Bethlehem, Easton, and Franconia
School Administrative Unit (SAU)	SAU 35
Private Schools	No
Colleges/Universities	No
Licensed Childcare Facilities	No
Fire Statistics ***(NH Division of Forests & Lands, Fire Warden Report, and the Town)***	
Wildfire Fires (2022)	No
Grafton County Fire Statistics (2022)	13 fires, 5.68 acres
State Forest Fires Statistics (2022)	59 fires, 202.95 acres

Unless otherwise noted, information in Table 2.1 was derived from the Town, the US Census 2020, and the Economic & Labor Market Information Bureau, NH Employment Security, October 2023. Community Response Received 7/12/2023, https://www.nhes.nh.gov/elmi/products/cp/profiles-pdf/sugarhill.pdf.

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Chapter 3: Hazard Identification, Risk Assessment & Probability

A. HAZARD IDENTIFICATION

The first step in hazard mitigation is to identify hazards. The Team determined that ten natural hazards 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 instances[12], 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 Sugar Hill. However, several of the State's hazards were excluded from this Plan - these hazards scored a zero during the HIRA process and were excluded from Table 3.1 on page 33. The reasons for exclusion are further explained below.

State Hazard	Reason for Exclusion from this Plan
*Coastal Flooding	Distance away from the sea
*Landslides	No known areas subject to landslide in the Town
*Solar Storms & Space Weather	The Team felt this was not something the Town could manage
*Avalanche	No known areas of avalanches
*Dam Failure	No dams will affect the Town if breached
Radiological	Distance away from radiological sites
Known & Emerging Contaminants	Homeowners would handle mitigation
Conflagration	No known areas for a conflagration event
Hazardous Materials	No known facilities that store/have them

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. *=*Natural Hazardsas identified in this Plan.*

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 classification[13]. 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.

[12] 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)

[13] 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, https://pro.arcgis.com/en/pro-app/latest/help/mapping/layer-properties/data-classification-methods.htm

C. PROBABILITY

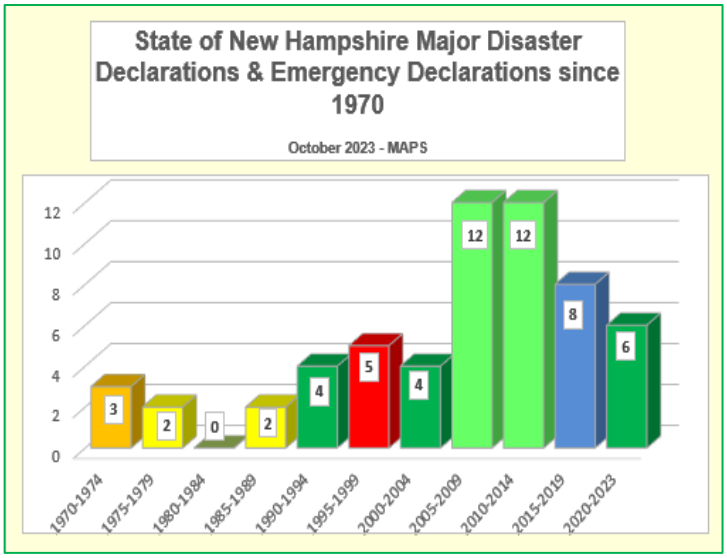
The determination of the probability of occurrence is contained within Column D in Table 3.1, which assesses hazards based on the likelihood that the hazards will occur within 25 years. The probability scores indicate whether the identified hazard has a *Very Low, Low, Moderate, High, or Very High* probability.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

Sugar Hill is reasonably safe from natural, technological, and human-caused hazards. However, due to Sugar Hill's geographic location within the White Mountains and its rivers, forests, and topography, there is always the 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. *"Climate change increases the frequency, duration and intensity of natural hazards, such as wildfires, extreme heat, drought, storms, heavy precipitation and sea level rise. Communities are feeling the impacts of a changing climate now.",* FEMA stated in its State Mitigation Plan Mitigation Policy Guide[14]. FEMA recognizes climate change by including climate change in this 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.[15] The decade beginning in 2020 includes six disaster declarations: DR-4516 and EM-3445, DR-4622, DR-4624, DR-4693, and DR-4740.



Communities in New Hampshire, such as Sugar Hill, have become increasingly aware of climate change's impact on the hazards already experienced and anticipate an increase in probability in the future. To help combat climate change, the Highway Garage is equipped with full solar and carries a "credit" with the grid. In addition, exemptions are given to Sugar Hill residents for personal solar projects.

HAZARD PROBABILITY COMBINED WITH LONG-TERM UTILITY OUTAGE

Any potential disaster in Sugar Hill 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.

[14] State Mitigation Planning Policy Guide, FEMA, Released April 19, 2022, page 6
[15] Derived from FEMA's record of disasters; categorized by decade since 1970 by the Planner

TABLE 3.1: HAZARD IDENTIFICATION & RISK ASSESSMENT (HIRA)

Table 3.1 - Hazard Identification & Risk Assessment (HIRA)							
Scoring for Probability	**Column A**	**Column B**	**Column C**	**Column D**	**Column E**	**Column F**	**Risk**
1=Very Low (0-20%)	**Probability**				**Severity**	**Relative Threat**	**Very High** 8-9
2=Low (21-40%)	Human Impact	Property Impact	Business Impact	Occurrence within 25 years	Average of Human, Property & Business Impact (A+B+C)/3	Risk Severity x Occurrence D x E	**High** 6-7
3=Moderate (41-60%)							**Medium** 4-6
4=High (61-80%)							**Low** 3-4
5=Very High (81-100%)							**Very Low** 1-2
Natural Hazards							
1) Inland Flooding	3.00	4.00	2.00	3.00	3.00	9.00	Very High
2) High Wind Events	3.00	3.00	2.00	3.25	2.67	8.67	Very High
3) Severe Winter Weather	3.00	3.00	2.00	3.00	2.67	8.00	Very High
4) Infectious Disease	3.00	1.00	3.00	3.00	2.33	7.00	High
5) Lightning	2.00	2.00	2.00	3.00	2.00	6.00	High
6) Wildfire	2.00	3.00	3.00	2.00	2.67	5.33	Medium
7) Extreme Temperatures	2.00	1.00	1.00	3.00	1.33	4.00	Medium
8) Drought	1.00	2.00	1.00	3.00	1.33	4.00	Medium
9) Tropical/Post Tropical Cyclones	3.00	3.00	3.00	1.00	3.00	3.00	Low
10) Earthquake	1.00	1.00	1.00	1.00	1.00	1.00	Very Low
Technological & Human-Caused Hazards							
1) Long-Term Utility Outage	3.00	3.00	4.00	5.00	3.33	16.67	Very High
2) Aging Infrastructure	2.00	2.00	2.00	2.00	2.00	4.00	Medium
3) Known & Emerging Contaminants	1.00	1.00	1.00	1.00	1.00	1.00	Very Low
4) Cyber Events	2.00	2.00	2.00	3.00	2.00	6.00	High
5) Mass Casualty Incidents	2.00	2.00	2.00	2.00	2.00	4.00	Medium
6) Transport Accidents	2.00	2.00	2.00	2.00	2.00	4.00	Medium
7) Terrorism & Violence	2.00	2.00	2.00	1.00	2.00	2.00	Very Low

D. NATIONAL FLOOD INSURANCE PROGRAM (NFIP) STATUS

Sugar Hill entered the National Flood Insurance Program (NFIP) on April 2, 1986.

Sugar Hill has a small floodplain with approximately .56 square miles of land in the 100-year floodplain[16], 0.1 square miles of which is inland water. The floodplain areas of Sugar Hill are primarily along the Gale River, Bowen Brook, Salmon Hole Brook, and Indian Brook. The floodplain is also shown at Streeter Pond, Coffin Pond, and in and around swampy areas in the Community. Many other small streams and brooks throughout the Town may also experience flooding. Sugar Hill is likely to experience flooding on several roads and along most rivers and streams.

The latest Flood Insurance Rate Studies (FIRS) and Digital Flood Insurance Rate Maps (DFIRMS) are dated February 20, 2008. The latest DFIRM and FIS are incorporated by reference when amended in the Floodplain Ordinance.

According to the Office of Strategic Initiatives (OSI), one single-family home NFIP policy is in effect in Sugar Hill for $250,000 of insurance in force. There has been one paid loss for a total of $0.00. The BEA/OSI also reports zero repetitive losses.[17]

NATIONAL FLOOD INSURANCE PROGRAM

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

TOWN OF SUGAR HILL FLOODPLAIN ORDINANCE

Sugar Hill established a stand-alone flood ordinance called the "Town of Sugar Hill Floodplain Ordinance"; this ordinance was most recently revised in April 2007. The ordinance begins with the following statement[18]:

"This ordinance, adopted pursuant to the authority of RSA 674:16, shall be known as the Town of Sugar Hill Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement the regulations in the Town of Sugar Hill Zoning Ordinance, and shall be considered part of the Zoning Ordinance for purposes of administration and appeals under state law. If any provision of this ordinance differs or appears to conflict with any provision of the Zoning Ordinance or other ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall 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 Rate Maps dated 04/02/86 which are declared to be part of this ordinance and are hereby incorporated by reference."

[16] GIS Analysis of Grafton County DFIRM (Digital Flood Insurance Rate Map)
[17] NH Office of Strategic Initiatives (OSI); Jennifer Gilbert, October 10, 2022
[18] Town of Sugar Hill Floodplain Ordinance, Revised 04/07; all italicized words are taken directly from the ordinance

Elements of the Sugar Hill Floodplain Ordinance are listed below with a brief description of the item if warranted[19]:

Item I - Definition of Terms:

Item II – Permits:

"All proposed development in any special flood hazard shall require a permit."

Item III - Construction Requirements:

Requirement for the building inspector to review *"all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding."* Item III goes on to discuss requirements to prevent flooding.

Item IV - Water and Sewer Systems:

Specifications for water and sewer systems states, *"…the applicant shall provide the Building Inspector with assurance that these systems will be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and on-site waste disposal systems will be located to avoid impairment to them or contamination from them during periods of flooding".*

Item V – Certification:

"For all new or substantially improved structures located in special flood hazard areas, the applicant shall furnish the following information to the building inspector:

a. *the as-built elevation (in relation to NGVD) of the lowest floor (including basement) and include whether or not such structures contain a basement.*
b. *if the structure has been flood proofed, the as-built elevation (in relation to NGVD) to which the structure was flood proofed.*
c. *Any certification of flood proofing.*

The Building Inspector shall maintain for public inspection, and shall furnish such information upon request."

Item VI – Other Permits:

"The Building Inspector shall not grant a building permit until the applicant certifies that all necessary permits have been received from those government agencies from which approval is required by federal or state law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334."

Item VII – Watercourses:

Item VII details the specifications for riverine situations, floodways and watercourses, and coordination with the Wetlands Board of New Hampshire (DES); among other watercourse-related items, this ordinance states: *"No encroachments, including fill, new construction, substantial improvements, and other development are allowed within the floodway that would result in any increase in flood levels within the community during the base flood discharge".*

Item VIII – Special Flood Hazard Areas:

Item VIII provides specifications for new construction or substantial improvements in Zone A and the determination of the 100-year flood elevation, flood proofing requirements, and lowest floor requirements. Manufactured homes and recreational vehicles are also discussed within this Item.

[19] Items in italic are taken directly from the Sugar Hill Floodplain Ordinance

Item IX – Variances and Appeals:

Item IX describes the variance and appeals process and states, "*Any order, requirement, decision or determination of the building inspector made under this ordinance may be appealed to the Zoning Board of Adjustment as set forth in RSA 676:5".*

Sugar Hill'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.

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.

As a small and close-knit community, the Board of Selectmen, the Planning Board, the Building Inspector, and the Hazard Mitigation Planning Team are almost always aware of new construction and/or substantial improvements that take place in town. Although Sugar Hill has a relatively small designated Special Flood Hazard Area, the Team felt it worthwhile to post flood information on the Town's website and add a link to the NFIP to provide public education for current homeowners and potential developers.

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. The Town will continue to work with the Bureau of Economic Affairs 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 Sugar Hill.

TABLE 3.2: HISTORIC HAZARD IDENTIFICATION

Key for Table 3.2

2017HMPT ..... 2017 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
B. Wildfire
C. High Wind Events
D. Severe Winter Weather
E. Earthquake
F. Drought
G. Miscellaneous Hazards
H. Other Hazards

Type of Event	Date of Event	Location	Description	Source
A. Inland flooding includes flooding caused by 100-year rain events, heavy rainfall, rapid snowmelt, ice jam flooding, dam failure, and local road flooding: Riverine flooding is the most common disaster event in NH. Significant riverine flooding in some areas of the State occurs in less than ten-year intervals and increases 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 has occurred in Sugar Hill since the December 2202 winter storm declaration that brought all rain to Sugar Hill.				
A summary of flood events, including Major Disaster & Emergency Declarations in the State & regionwide				
Flooding before 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-4622)**, 2021 **(DR-4624)**, 2022 **(DR-4693)**, 2023 **(DR-4740)**			

Type of Event	Date of Event	Location	Description	Source
A detailed summary of flood events in the Community				
Inland Flooding (Heavy Rain)	Multiple Dates	Bowen Brook	Bowen Brook has flooded three times in the past, causing flooding in three structures; floods during every significant storm. Bowen Brook also causes flooding on NH Route 117.	2005 HMPT & 2017 HMPT
Inland Flooding (Ice Jam)	Early 1970s	Streeter Pond Road at Gale River	Section of Street Pond Road washed out; state estimate of $100,000 in damage.	2005 HMPT
Inland Flooding (Heavy Rain)	March 15, 1979	Sugar Hill	**Presidential Emergency Declaration EM-3073:** Pearl Lake Road flooded; a culvert was lost in the flood, and the road was completely washed out and closed for a few days.	FEMA & 2017 HMPT
Inland Flooding (Ice Jam)	Late 1980's	Streeter Pond Road at Gale River	Streeter Pond Road washout: one person tried to drive through it, caused by an ice jam in Gale River that took out part of the road and flooded a farmhouse; a .5-.75 mile stretch of Streeter Pond was flooded.	2005 HMPT & 2017 HMPT
Inland Flooding (Ice Jam)	1992	Streeter Pond Road at Gale River	Once again, a section of Streeter Pond Road washed out near the Gale River, causing road flooding and washouts.	2005 HMPT & 2017 HMPT
Inland Flooding (Heavy Rain)	October 7-18, 2005	Belknap, Cheshire, Grafton, Hillsborough, Merrimack & Sullivan	**Major Disaster Declaration DR-1610:** State and federal disaster assistance reached more than $3 million to help residents and business owners in New Hampshire recover from losses resulting from the severe storms and flooding in October. Sugar Hill experienced heavy autumn rains and flooding in the usual places.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain)	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	**Major Disaster Declaration DR-1643:** Flooding occurred in most of southern NH from May 12-23, 2006 (Mother's Day Storm). Sugar Hill experienced high wind and heavy rain that caused numerous roads to erode; the Town was without power for up to eight days in some locations.	FEMA & 2024 HMPT
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). Sugar Hill lost parts of Lafayette and Carpenter Roads; received FEMA money to rebuild these two roads; downed trees and some power outages.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain & Tornado)	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	**Major Disaster Declaration DR-1787:** A period of severe storms and flooding from July 24 to August 14; a tornado occurred on July 24, 2008. Sugar Hill received heavy rain and minor flooding during this period in typical locations.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain) & **Hail**	May 26-30, 2011	Coos & Grafton County	**Major Disaster Declaration DR-4006:** Flooding and hail occurred due to a severe storm on May 26-30, 2011, in Coos & Grafton Counties (Memorial Day Weekend Storm). Sugar Hill received heavy rain and some hail but did not receive as much damage as other northern NH communities, particularly Dalton and Lancaster, along the Connecticut River. It is sometimes called a "Vermont coastal storm" as the weather pattern marches up the Connecticut River.	FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
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 9-10, 2013	Cheshire, Sullivan & Grafton	**Major Disaster Declaration DR-4139:** Severe storms, flooding, and landslides occurred from June 26 to July 3, 2013, in Cheshire and Sullivan Counties and southern Grafton County. Minor flooding occurred in Sugar Hill, but more damaging weather was in southern Grafton County, Sullivan, and Cheshire Counties.	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- 2, 2017, in two New Hampshire Counties. Heavy rain produced significant road damage in the usual locations throughout Sugar Hill (see October 1, 2010, above for usual locations); Sugar Hill anticipates approximately $500,000 worth of damage from this unusually heavy rain event; heavy rains (up to 4.5 inches in some locations) caused flash flooding in much of central New Hampshire and Grafton County; numerous road washouts were reported in Haverhill, Bath, Bethlehem, Woodstock, Benton, Campton and Sugar Hill. **Note:** Virtually every area that flooded in October 2010 and April 2011 flooded again in this July rain storm; seven additional areas were added for the July 2017 event: Pearl Lake to Creamery, Birches Road, Jericho Road, Lovers Lane, Post Road,) Valley Vista Road and Kathy Rae Drive.	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 NH to supplement state and local recovery efforts in the areas affected by severe storms and flooding from October 29-November 1, 2017, in five counties. Sugar Hill had minimal disruption; only a few trees were damaged.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain)	July 11-12, 2019	Grafton	**Major Disaster Declaration, DR 4457:** The Federal Emergency Management Agency announced a major disaster declaration for several severe storms and flooding from July 11-12, 2019, in one New Hampshire County. Road flooding was experienced in the usual areas; flooding was far less significant than in July 2017.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain)	December 22-25, 2022	Grafton, Belknap, Coos, Carroll	**Major Disaster Declaration, DR 4693:** See below under Severe Winter Weather	FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Inland Flooding (Heavy Rain)	May 1, 2023	Sugar Hill	The Town saw minor washouts, which the Highway Department easily repaired—no significant issues.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain)	July 9-17, 2023	Coos, Grafton, Belknap, Sullivan & Cheshire	**Major Disaster Declaration, DR-4740:** The Federal Emergency Management Agency announced a major disaster declaration and notification of individual and public assistance on September 14, 2023, for five NH Counties. Sugar Hill experienced high winds, causing trees and wires to go down and minor power outages. Creamery Pond Road and Easton Road had clogged culverts, creating minor erosion.	FEMA & 2024 HMPT
Inland Flooding (Heavy Rain)	December 18, 2023	Sugar Hill	A significant rainstorm similar to a 100-year flood struck multiple areas in NH, causing widespread damage to rivers, roads, and bridges. This storm is likely to be declared a Major Disaster Declaration. Sugar Hill experienced heavy rain and wind, causing moderate damage to trees and power lines. Culverts were plugged and overwhelmed, causing Creamery Pond Road, Easton Road, and Presby Road erosion. There was minor flooding on Streeter Pond Road in several spots; the road was still passable. Due to drainage issues, Crane Hill Road had minor flooding in lower-lying areas. One house along Route 18 on the Gale River experienced basement flooding, leading to a loss of power and heat. The heavy rain and warm weather made some roads difficult to pass due to deep mud; the Highway Department had to grade the roads with gravel to make them passable again.	FEMA & 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. Since the prior hazard mitigation plan, no significant wildfire events have occurred in Sugar Hill, although assistance was given to help suppress the Dilly Cliff fire in 2017.				
A summary of wildfire events, including Major Disaster & Emergency Declarations in the State and other recent large fires				
Wildfire (Fire of 1947)	October 21, 1947	Strafford County	This fire, caused by drought conditions and a spark from the Boston & Maine Railroad, burned a swath 9.5 miles long and 1.5 miles wide starting in Farmington; the fire was widespread enough to cause significant damage in Maine. Spaulding High School was used to serve meals to the hundreds of firefighters and volunteers who assisted. Around a thousand people were evacuated in Rochester; the fire resulted in one death, an 18-year-old UNH student. This fire did not reach Grafton County or Sugar Hill.	Local Resources & 2024 HMPT
Wildfire (Shaw Mountain)	July 2, 1953	Carroll County	**Major Disaster Declaration DR-11:** This wildfire occurred in Carrol County at Shaw Mountain. This fire did not reach Grafton County or Sugar Hill.	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. Military and private helicopters and fire crews from all over the State assisted in extinguishing this fire. The Bayle Mountain Fire did no damage to homes. This fire did not reach Grafton County or Sugar Hill.	Local Resources & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Wildfire (Stoddard)	April 2016	Cheshire County	**Fire Management Assistance Declaration, FM-5123:** Stoddard, NH. The Stoddard Fire burned 190 acres in April 2016 and caused the evacuation of 17 homes; Class D fire. This fire did not reach Grafton County or Sugar Hill.	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 Grafton County or Sugar Hill.	Local Resources & 2024 HMPT
Wildfire (Dilly Cliff)	October 2017	Grafton County	**The Dilly Cliff Fire:** This fire occurred on 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 later. This fire was in Grafton County but did not reach Sugar Hill. Sugar Hill firefighters and equipment responded for multiple days to assist in putting this fire out.	Local Resources & 2024 HMPT
Wildfire (Bemis)	May 14, 2022	Carroll County	**The Bemis Fire** lasted six days, burning 106 acres on the steep terrain around Bemis Brook in Crawford Notch State Park. Local firefighters, the NH Division of Forest and Lands, and members of the US Forest Service from Maine, Colorado, and Virginia all responded to extinguish the fire. There were no structures damaged or injuries to the public or responders. This fire did not reach Grafton County of Sugar Hill.	Local Resources & 2024 HMPT
Wildfire (Centennial Fire)	May 9, 2022	Coos County	**The Centennial Fire**, caused by an out-of-control campfire, burned 48 acres along the Appalachian Trail (state land) in Shelburne. There was a multi-agency response but no structural damage or injuries. This fire did not reach Grafton County or Sugar Hill.	Local Resources & 2024 HMPT
A detailed summary of wildfire events in the Community				
No wildfires of significance have occurred in Sugar Hill since the 2017 Hazard Mitigation Plan was completed.				2024 HMPT
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 happen throughout NH and are becoming more prevalent 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 prevalent but modest compared to other states in New England. A hurricane downgraded to a Tropical Storm is more likely to impact New Hampshire. Tornadoes and other wind events can impact the Community on a townwide basis. Since the last hazard mitigation plan, no significant high wind events have occurred in Sugar Hill.				
A summary of high wind events & tropical & post-tropical cyclone events, including Major Disaster & Emergency Declarations in the State & regionwide				
Tropical & Post-Tropical Cyclones	1804, 1869, 1938, 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

Type of Event	Date of Event	Location	Description	Source
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, reported as an F3.	See below
A detailed summary of high wind & tropical & post-tropical cyclone events in the Community				
Tropical & Post-Tropical Cyclone (Great New England Hurricane)	September 21, 1938	All Ten NH Counties	**The Great New England Hurricane:** Statewide, multiple deaths occurred, and damages in NH were about $12.3 million in 1938 dollars (about $200 million now). This storm damaged 20,000 structures, 26,000 automobiles, 6,000 boats, and 325,000 sugar maples throughout New England. 80% of the people lost power. Although there was no local recollection, it was expected that the damage would have been similar to the rest of the State in Sugar Hill. *(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 extensive tree and power line damage and significant crop losses. Localized flooding and winds measuring over 100 mph also occurred. Hurricane Carol was followed by Hurricane Edna just 12 days later, which caused already weakened trees to fall. Although there was no local recollection, it was expected that the damage would have been similar to the rest of the State in Sugar HIll. (Source: http://www.wmur.com/Timeline-History-Of-NH-Hurricanes/11861310)	FEMA & 2024 HMPT
Tropical & Post-Tropical Cyclone (Hurricanes Bob)	August 18-20, 1991	Sugar Hill	**Presidential Disaster Declaration DR-917:** Sugar Hill received heavy rain and some minor flooding in the usual places.	FEMA & 2017 HMPT
Tropical & Post-Tropical Cyclone (Tropical Storm Floyd)	September 16-18,1999	Belknap, Cheshire & Grafton	**Major Disaster Declaration DR-1305:** The declaration covers damage to public property from the storm that spawned heavy rains, high winds, and flooding throughout September 16-18. The worst of this storm occurred in lower Grafton County; Sugar Hill received some minor flooding in the usual places.	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 areas struck by Hurricane Katrina; emergency assistance to those areas began on August 29, 2005. The President's action made federal funding available to all 10 New Hampshire counties. No people or pets were evacuated to Sugar Hill.	FEMA & 2024 HMPT
Microburst & Long Term Utility Outage	September 30, 2010	Sugar Hill	In September 2010, a microburst downed trees and power lines, affecting Grandview, Blake, South, Carpenter, Birches, Lafayette, and Toad Hill Roads.	2012 HMPT & 2017 HMPT

Type of Event	Date of Event	Location	Description	Source
Hurricane & Tropical Storm Irene & Extended Power Failure	August 26-September 6, 2011	**EM 3333:** All Ten NH Counties **DR-4026:** Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	**Emergency Declaration EM-3333 & Presidential Disaster Declaration DR-4026:** Tropical Storm Irene Aug 26th- Sept 6, 2011, Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan Counties; Emergency Declaration for all ten counties; During Tropical Storm Irene, significant damage was done to many of Sugar Hill's roads; several overwhelmed culverts in the usual places; some of these culverts had been fixed with FEMA funding according to DES specifications which turned out not to be enough to prevent future flooding (same areas flooded again in 2017); also some minor basement flooding and parts of Sugar Hill lost power for a couple days.	FEMA & 2017 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 and brought high winds, power outages, and heavy rain to six New Hampshire counties. Sugar Hill received heavy rains, but like the rest of northern NH, there was no significant impact.	FEMA & 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 can impact the Community townwide. No significant winter weather events have occurred in Sugar Hill since the December 2022 wind/snow/rain event declared in Grafton County.				
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 and caused significant disruptions to power, transportation, and public and private utilities.	FEMA & 2024 HMPT
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 major severe winter weather events with snowfalls exceeding 2' in parts of the State. Power and transportation systems were disrupted.	FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
A detailed summary of severe winter storm events in the Community				
Severe Winter Weather (Snowstorm)	Winter of 1968-69	All Ten NH Counties	The winter of 1968-69 brought record amounts of snow to 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 and 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. The Sugar Hill Road Agent remembered "sliding off the porch roof" due to the very high accumulations found throughout the State; heavy equipment was used to remove snow due to the accumulations.	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 storm severely affecting southern New England, resulted in high snow accumulations throughout New Hampshire. This storm also brought hurricane-force winds, making this 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 the coast of New Hampshire. Sugar Hill, like the rest of inland New Hampshire, received heavy snow but not the dangerous conditions that occurred in coastal areas; the Sugar Hill Highway Department easily handled the snow accumulation.	FEMA & 2024 HMPT
Severe Winter Weather (Ice Storm) & **Long Term Utility Outage**	January 7-25, 1998	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Strafford & Sullivan	**Major Disaster Declaration DR-1199:** A major ice storm struck nearly every part of the State, with more impact in northern communities and areas over 1,000 feet above sea level. Many trees were down, and there was a massive loss of timber and a large amount of slash on the forest floor. The 1998 ice storm significantly affected Sugar Hill; parts of the Community lost power for up to seven days, and there was significant forest damage; no significant structure damage was reported.	FEMA & 2024 HMPT
Severe Winter Weather (Snowstorm)	March 5-7, 2001	Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Strafford	**Emergency Declaration EM-3166:** The emergency declaration covers jurisdictions with record and near-record snowfall from a late winter storm in March 2001, which affected six New Hampshire counties. Sugar Hill received heavy snow, but the Sugar Hill Highway Department easily handled the snow accumulation.	FEMA & 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 throughout December 6-7, 2003, and affected eight New Hampshire counties. Sugar Hill received heavy snow, but the Highway Department easily handled the snow accumulation.	FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
Severe Winter Weather (Snowstorms)	January 22-23, 2005 February 10-11, 2005 March 11-12, 2005	**EM-3208-002** (Jan, Feb & Mar): All Ten NH Counties **EM-3207** (Jan): Nine NH Counties **EM-3208** (Feb): Five NH Counties **EM-3211** (Mar): Five NH Counties	**Emergency Declaration EM 3208-002:** The Federal Emergency Management Agency (FEMA) obligated more than $6.5 million to reimburse state and local governments for costs incurred in three snowstorms. The total aid for all three storms was $6,892,023. **Emergency Declaration EM-3207:** The total aid for the January storm in Grafton was $137,118. **Emergency Declaration EM-3208**: The total aid for the January storm in Grafton was $213,539. **Emergency Declaration EM-3211:** Grafton County was not declared. Sugar Hill received heavy snow from these storms, but the Highway Department easily handled the snow accumulation.	FEMA & 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 had been obligated by May 2009. The 2008 Ice Storm caused power outages for 8-9 days in some areas of Sugar Hill; this storm caused massive damage in southern NH, delaying restoration to some North Country towns.	FEMA & 2024 HMPT
Severe Winter Weather (Snowstorm)	February 23-March 3, 2010	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	**Major Disaster Declaration: DR-1892:** Flood and wind damage occurred in southern NH, including six counties, resulting in 330,000 homes without power. More than $2 million was obligated by FEMA by June 2010. Sugar Hill received heavy snow, but the Highway Department easily handled the snow accumulation	FEMA & 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). Leaves were still on trees, contributing to multiple power outages in Sugar Hill. Sugar Hill received heavy snow, but the Highway Department easily handled the snow accumulation; it was noted that this late autumn storm made it difficult to plow gravel roads as the roads were not yet frozen.	FEMA & 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). Sugar Hill received snow, but the Highway Department easily handled the snow accumulation.	FEMA & 2024 HMPT
Winter Weather & Hazardous Materials-Transport	Winter of 2016-17	Sugar Hill	The winter of 2016-17 in northern New Hampshire was warmer than usual in some locations, bringing icy road conditions throughout communities such as Sugar Hill; the Sugar Hill Road Agent reported that it is a daunting task keeping up with ice on roads and it seemed that last winter brought icy conditions nearly every day.	2017 HMPT
Severe Winter Weather (Snowstorm) **Long Term Utility Outage**	December 22-25, 2022	Belknap, Grafton, Coos & Carroll	**Major Disaster Declaration, DR-4693:** A severe winter storm occurred December 22-25, 2022. Heavy, wet snow caused trees and power lines to fall; some roadways were closed. This storm was "horrendous" in Sugar Hill. Trees were down all over the Town, and almost every road was closed. Power was out for as long as five days, and it took weeks to clean up the roadways; some work continues today. FEMA assistance has been requested.	FEMA & 2024 HMPT

Type of Event	Date of Event	Location	Description	Source
E. Earthquakes: According to the NH State Hazard Mitigation Plan, New Hampshire lies in an area of "Moderate" seismic activity compared to other areas of the United States. "Major" activity areas border New Hampshire to the north and southwest. Generally, earthquakes in NH cause little or no damage and have not exceeded a magnitude of 5.5 since 1940. Earthquakes have the potential to impact the Community on a townwide basis. Since the last hazard mitigation plan, Sugar Hill has not felt significant earthquakes.				
A summary of earthquakes with a magnitude of 4.0 or more significant in the State & regionwide				
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 may have been felt in the Community since 1940 with a magnitude of 3.0 or greater				
Earthquake	December 20, 1940	Tamworth, NH	Magnitude 5.3	United States Geological Society (USGS), State of NH Multi-Hazard Mitigation Plan Update, 2018 & 2024 HMPT
Earthquake	December 24, 1940	Tamworth, NH	Magnitude 5.6	
Earthquake	June 26, 1964	Salisbury, NH	Magnitude 3.2	
Earthquake	June 15, 1973	Quebec/ME border	Magnitude 4.8	
Earthquake	December 25, 1977	Hopkinton, NH	Magnitude 3.2	
Earthquake	June 28, 1981	Sanbornton, NH	Magnitude 3.0	
Earthquake	January 19, 1982	Sanbornton, NH	Magnitude 4.5	
Earthquake	October 25, 1986	Northfield, NH	Magnitude 3.9	
Earthquake	October 20, 1988	Milan, NH	Magnitude 3.9	
Earthquake	November 22, 1988	Milan, NH	Magnitude 3.2	
Earthquake	April 6, 1989	Berlin, NH	Magnitude 3.5	

Type of Event	Date of Event	Location	Description	Source
Earthquake	October 6, 1992	Canterbury, NH	Magnitude 3.4	
Earthquake	August 21, 1996	Livermore, NH	Magnitude 3.8	
Earthquake	June 16, 1995	Lisbon, NH	Magnitude 3.8	
Earthquake	January 10, 1999	Merrimac, MA	Magnitude 3.1 & 3.0	
Earthquake	January 27, 2000	Fremont, N	Magnitude 3.0	
Earthquake	September 26, 2010	Canterbury, NH	Magnitude 3.2	
Earthquake	October 16, 2012	Hollis Center, ME	Magnitude 4.7	
F. Drought: Drought is generally not as damaging or disruptive as floods and other hazards and is more challenging to define. A drought is a natural hazard that evolves over months or even years and can last as long as several years to as short as a few months. According to the NH State Hazard Mitigation Plan, New Hampshire has a low probability, severity, and overall risk for drought. Droughts have the potential to impact the Community on a townwide basis. The last significant drought that occurred in Sugar Hill was in 2022.				
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, 2022		Occurrences of severe droughts in recorded New Hampshire history.	State of NH Multi-Hazard Mitigation Plan
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	The lengthiest recorded regional 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 summers of 2016 and 2017, moderating from extreme in southern New Hampshire to dry in the northern communities. Sugar Hill had "dry" conditions and did not experience a significant impact except for a bacterially contaminated water well at a well-known inn in Sugar Hill.	
Drought	2020-2021	Statewide	A declared drought for 2020-2021, with NH's north country being impacted more than the southern communities. In Sugar Hill, a few dug wells and springs dried up.	
Drought	2022	Statewide	A declared drought in the summer and fall of 2022 waned as fall and winter approached and after several periods of rain. This drought moderated from south to north. Significant drought conditions had nearly abated by January 2023. The impact was minimal in Sugar Hill	

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 and can impact the Community townwide. One concern is transporting hazardous material through communities by rail and tractor-trailer. Sugar Hill has had no miscellaneous hazard events since the last hazard mitigation plan, except for COVID-19				
Infectious Disease	January 2020-May 2023	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 specific private nonprofit organizations under the major disaster declaration issued by the President on April 3, 2020, as a result of the Coronavirus Disease 2019 ("COVID-19").	FEMA & 2024 HMPT
Infectious Disease	January 2020-May 2023	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
High Winds & Long Term Utility Outage	Nov-95	Town Wide	A severe fall storm created high winds which took down trees and caused a widespread power outage; without power for nearly one week.	2005 HMPT
Erosion, Mudslide & Landslide (erosion)	October 2010 & Potential	South & Grandview Roads	Loose terrain combined with heavy rain creates erosion that can affect NH Route 117; erosion and subsequent slides on South and Grandview Roads have happened in the past and as recently as October 2010. This area has been mitigated.	2012 HMPT
H. Other Hazards: Identified hazards with no specific example of occurrence.				
Natural Hazards				
Extreme Temperatures				
Technological Hazards				
Aging Infrastructure				
Known & Emerging Contaminants				
Human-Caused Hazards				
Cyber Events				
Mass Casualty Incidents				
Transport Accidents				
Terrorism & Violence				

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 the Community either locally or townwide.

See *Table 3.1, Hazard Threat Analysis,* and Chapter 5 for more details on these hazards.

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

- Website for NH Disasters: https://www.nh.gov/safety/divisions/hsem/disaster/documents/NHDisasterInfo.pdf
- FEMA Disaster Information: https://www.fema.gov/disaster
- The Tornado Project: https://www.tornadoproject.com/alltorns/nhtorn.htm
- The Disaster Center (NH): https://www.disastercenter.com/newhamp/tornado.html
- United State Geological Survey (earthquakes); https://www.usgs.gov/programs/earthquake-hazards

Chapter 4: Critical Infrastructure & Key Resources (CIKR)

Team discussion and brainstorming identified Critical Infrastructure & Key Resources (CIKR) within Sugar Hill. 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 (ERFS) & EVACUATION

Emergency Response Facilities (ERFs)			
ERFs are primary facilities and resources needed during an emergency response.			
Facility	**Type of Facility**	**Hazard Risk**	
Sugar Hill Fire Station ***(generator)***	Fire station & secondary shelter	All Hazards	1
Sugar Hill Town Office ***(Crapo Building, generator)***	Town government, records, police station, primary EOC & primary shelter	All Hazards	1
Sugar Hill Town Garage ***(generator)***	Heavy Equipment, sand, gravel & emergency fuel	All Hazards	1
Helicopter Landing Zones			
Sugar Hill Little League Field	Heli-landing zone (*N 44 12.810, W 71 47.951)*	All Hazards	1
Pearl Lake Road near Post Road ***(Stone House)***	Heli-landing zone *(N 44 12.661, W 71 49.355)*	All Hazards	1
Pearl Lake Road ***(before Brick House)***	Heli-landing zone *(N 44 12.399, W 71 49.965)*	All Hazards	1
Toad Hill Farm Road	Heli-landing zone *(N 44 11.092, W 71 46.913)*	All Hazards	1
Crane Hill Road ***(near Iron Bridge to Streeter Pond)***	Heli-landing zone *(N 44 14.926 W 71. 46.754)*	All Hazards	1
Sunset Hill Golf Course	Heli-landing zone *(N 44 12.651, W 71 47.321)*	All Hazards	1
Evacuation Routes			
NH Route 117 East to NH Route 18	Primary evacuation route	All Hazards & Inland Flooding	3
NH Route 117 West to US Route 302	Primary evacuation route	All Hazards & Inland Flooding	2
Bickford Hill Road to NH Route 116	Primary evacuation route	All Hazards & Inland Flooding	1
Interstate 93 Northbound *(accessible from other towns*)	Primary evacuation route	All Hazards	1
Interstate 93 Southbound *(accessible from other towns)*	Primary evacuation route	All Hazards	1
Center District Road to Crane Hill Road to Streeter Pond Road	Secondary evacuation route	All Hazards & Inland Flooding	3
Streeter Pond Road to US Route 302	Secondary evacuation route	All Hazards & Inland Flooding	3
South Road to Lafayette Road to NH Route 116	Secondary evacuation route	All Hazards & Inland Flooding	2
Easton Road to Easton Road to NH Route 116	Secondary evacuation route	All Hazards & Inland Flooding	2
Bridges & Culverts on the Evacuation Routes			
Crane Hill Bridge @ Gale River	Bridge on an evacuation route	All Hazards & Inland Flooding	3
NH Route 18 @ Indian Brook	Bridge on an evacuation route	All Hazards & Inland Flooding	3
Bickford Hill Road @ Ham Branch ***(Franconia)***	Bridge on an evacuation route ***(out of Town)***	All Hazards & Inland Flooding	2
NH Route 117 West @ Ammonoosuc River ***(Lisbon)***	Bridge on an evacuation route ***(out of Town)***	All Hazards	1
NH Route 117 East @ Gale River ***(Franconia)***	Bridge on an evacuation route ***(out of Town)***	All Hazards	1

Emergency Response Facilities (ERFs)			
Dams			
Coffin Pond Dam (NH Fish & Game)	Low-hazard dam	All Hazards	1
Streeter Pond Fish Screen (NH Fish & Game)	Non-menace dam	All Hazards	1
Recreation Pond Dam	Non-menace dam	All Hazards	1
Pinney Fire Pond	Non-menace dam	All Hazards	1
The Department of Environmental Services (DES) GIS layer indicates four additional dams in Sugar Hill. Two are exempt, one is breached, and one is classified as ruins. There are no high-hazard or significant-hazard dams in Sugar Hill.			

TABLE 4.2 – NON-EMERGENCY RESPONSE FACILITIES (NERFS)

Non-Emergency Response Facilities (NERFs)			
NERFs are facilities that, although critical, are unnecessary for immediate emergency response efforts. NEFRs would include facilities to protect public health and safety and act as backup emergency facilities when needed.			
Facility	**Type of Facility**	**Hazard Risk**	
Sugar Hill Meeting House	Possbile shelter & historic	All Hazards	1
Community Church	Possible shelter	All Hazards	1
The Inn at Sunset Hill ***(generator)***	Available for rooms, food & showers & potential shelter	All Hazards	1

TABLE 4.3 – FACILITIES & POPULATIONS TO PROTECT (FPPS)

Facilities & People to Protect (FPPs)			
FPPs are facilities that need protection because of their importance to the town and residents who may need help during a hazardous event.			
Facility	**Type of Facility**	**Hazard Risk**	
Sugar Hill Inn	Tourist population - inn & restaurant	All Hazards	1
Hilltop Inn	Tourist population - inn & restaurant	All Hazards	1
Inn at Sunset Hill	Tourist population - inn & restaurant	All Hazards	1
Polly's Pancake House	Tourist population - restaurant	All Hazards	1
Vulnerable Populations	Functional needs population	All Hazards	1

TABLE 4.4 – POTENTIAL RESOURCES (PRS)

Potential Resources (PRs)			
PRs are potential resources that could be helpful for emergency response in the case of a hazardous event.			
Sugar Hill Fire Department ***(823-8415)***	Fire Department (ERF)	All Hazards	1
Sugar Hill Highway Department ***(823-8788)***	Fuel, sand, gravel & heavy equipment	All Hazards	1
NH DOT Garage ***(Franconia, 823-5338)***	Fuel, sand, gravel & heavy equipment	All Hazards	1
Please refer to the Resource Inventory List in the Sugar Hill Emergency Operations Plan for additional resources.			

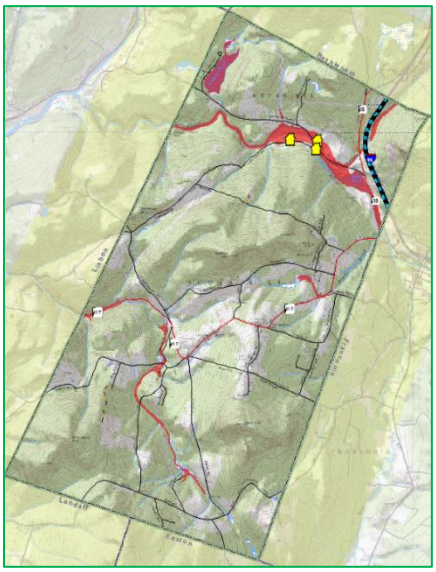
Chapter 5: Hazard Effects in Sugar Hill

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

Sugar Hill'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 image to the right indicate the floodplain. All CIKRs in Sugar Hill were identified in GIS; this list was then narrowed by those CIKRs that were located in the FEMA floodplain, represented by the small yellow houses in the image.

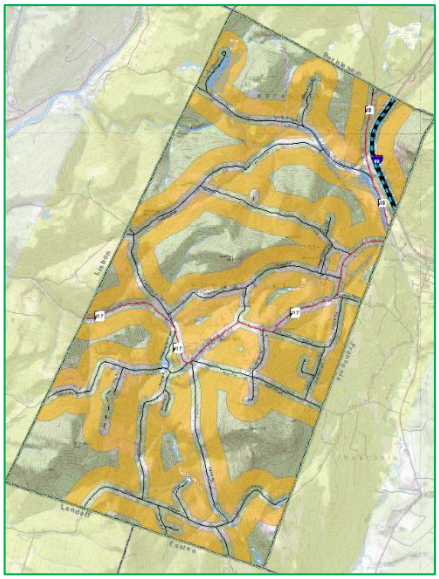


Using GIS, three CIKRs were found in the flood zone: the Crane Hill Road helicopter landing site, the Crane Hill Bridge over the Gale River, and the Preschool on Streeter Pond Road. Although it is expected that many other structures are, no other CIKRs were found to be in the designated FEMA floodplain. When discussing potential flood risk areas, the Team included several roads and bridges, including the Crane Hill Bridge, as mentioned above. Please refer to Chapter 4, Tables 4.1-4.4 for more information.

Town officials keep these CIKR and susceptible residences in mind when a flood hazard is likely. Sugar Hill's emergency services and town government buildings are not in the FEMA floodplain.

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 image to the right shows the traditional WUI In Sugar Hill. 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 - this would virtually cover the entire town in rural communities like Sugar Hill. 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.

No CIKRs were determined to be in the WUI through GIS or while working on Tables 4.1-4.4. The Towns' 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 image above, there are numerous dead-end streets in Sugar Hill, some of which may have higher than average wildfire risk due to the distance between structures, the number of old-growth softwoods that line the streets, and, of course, the lack of a second egress. The map image includes Class VI private roads.

As suggested above, many structures in Sugar Hill are expected to be prone to wildfires, particularly in neighborhoods with limited egress and a canopy of old-growth trees or where forests completely surround structures. However, because Sugar Hill 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 or not the impact is localized.

MS-1, 2023 Assessed Value of all Structures

Building Types	Value	1% Damage	5% Damage
Residential	$106,975,490	$1,069,755	$5,348,775
Manufactured Housing	$94,000	$940	$4,700
Commercial	$3,710,700	$37,107	$185,535
Discretionary Preservation Easement	$21,310	$213	$1,066
Tax Exempt	$1,443,300	$14,433	$72,165
Utilities	$3,000,600	$30,006	$150,030
Totals	$115,245,400	$1,152,454	$5,762,270

This Plan assumes that the potential loss from the identified natural hazards would range from **$0 to $1,152,454** or **$1,152,454 to $5,762,270**, based on the 2023 MS1 total structure value of **$115,245,400.** (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 for 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) ..... Very High
Probability ..... Moderate
Estimated Structure Loss Value ..... $1,152,454 to $5,762,270

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. If conducted improperly, timber harvesting, undersized or aging culverts, and inadequate ditching are possible causes of local road flooding.

Based on the Grafton County Floodplain Map and as described in Chapter 3, Section D, Sugar Hill has a small 100-year floodplain primarily near the Gale River, Indian Brook, Bowen Brook, and Salmon Hole Brook. Gale River is of most concern. However, the Team noted that only a few homes are affected by flooding of the Gale River.

Gale River and Crane Hill Bridge (lower right corner)
Photo Credit: GIS snip

Due to Sugar Hill's location in the mountains, flash flooding from the higher peaks frequently creates problems. It is not unusual for rainfall amounts to be considerably higher on the tops of New Hampshire's mountain peaks than in the valleys. An additional and perhaps larger concern is that when the Gale River floods Streeter Pond Road, part of the Town is effectively cut off from the rest. In this case, fire and other emergency responders would have to come to the cutoff part of the Town from Lisbon, approximately 11 miles away.

Since the last hazard mitigation plan, there have been several Major Disaster Declarations in Grafton County. Since July 2017, flooding has significantly impacted Sugar Hill in July 2019, December 2022, July 2023, and December 2023 (not declared). The impact of these disasters is detailed in *Table 3.2, Historic Hazard Identification*.

While staying within its budget, the Highway Department has been proactive in the maintenance and repairs of culverts, reducing the incidence of local road erosion and washouts. The Highway Department is responsible for 32.5 miles of paved and 3.5 miles of gravel roads. The State maintains major arteries; nonetheless, significant rain, particularly if combined with rapid snow melt, can cause considerable damage to Sugar Hill's roads. To further improve stormwater flow in the Community, culvert improvement projects are 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) HIGH WIND EVENTS

Hazard Identification & Risk Assessment (HIRA) ..... Very High
Probability ..... Moderate
Estimated Structure Loss Value ..... $1,152,454 to $5,762,270

Isolated High Wind Events

Isolated high winds and downdrafts are likely to occur in Sugar Hill. These unpredictable wind events could fall timber, block roadways, down power lines, and impair emergency response. These unexpected windstorms affect old-growth softwood, especially when the water table is high in the spring. Most of the land cover in Sugar Hill is forested.

Due to the location of Sugar Hill, the Town's proximity to some of New Hampshire's highest peaks, and the effect of wind in the river valleys, isolated high winds and down drafts often occur. The Team reported common occurrences of high and damaging winds and gusts to 120 mph because of the mountainous topography. Sugar Hill is designated as a "Special Wind Region," according to the American Society for Civil Engineers (ASC); building requirements based on this wind region are outlined as part of the building process. Damage to roof shingles, fallen trees, and downed power lines have resulted from isolated high-wind storms.

The Team noted that the power companies have recently increased their trimming efforts. The Highway Department and the power companies repeatedly remove downed trees. There have been no significant high wind events in Sugar Hill since the prior hazard mitigation plan.

Tornadoes & Downbursts (microbursts & macrobursts)

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

A tornado generally covers a large area, perhaps even several miles. It has winds that blow in a circular fashion, leaving behind downed trees lying in a swirling pattern. Straight-line winds and winds that burst downward indicate a microburst; the fallen trees left behind lay in roughly the same direction. A microburst must be 2.5 miles in width or less, whereas a macroburst is a similar wind event more than 2.5 miles wide and lasting longer than a microburst.

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 Sugar Hill, a microburst would be more likely than a tornado. Since the previous hazard mitigation plan, Sugar Hill has had no reports of downbursts or tornadoes.

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, forest damage, property damage, and economic hardship. Based on the potential devastation from tornadoes, macrobursts, or microbursts, the potential loss value was estimated to be between 1% and 5% of the total structure value.

3) SEVERE WINTER WEATHER

Hazard Identification & Risk Assessment (HIRA) ..... Very High
Probability ..... Moderate
Estimated Structure Loss Value ..... $1,152,454 to $5,762,270

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 Sugar Hill. These impacts are a risk to the Community, including isolation, especially to the elderly (30.3%) and other vulnerable populations. In addition, the ability to get in and out of town and emergency service access can be hindered.

Damage caused by severe winter snowstorms varies according to wind velocity, snow accumulation, duration, and moisture content. Seasonal accumulation can also be as significant as an individual snowstorm. Heavy overall winter accumulations can impact the roof load of some buildings. Significant snowstorms, nor'easters, and blizzards could diminish food supplies within two days.

As shown in Table 3.2, other snowstorms and nor'easters have struck Sugar Hill in the past, but the Highway Department could keep up with the accumulation. In a recent winter event, DR-4693, in December 2022, heavy wet snow caused trees to fall and many of the Town's roads to be closed. Power was out for some residents for as long as five days. See *Table 3.2, Historic Hazard Identification*, for more information on all winter events.

Although Sugar Hill's Highway Department handles usual snow amounts without difficulty, Sugar Hill's roads are often impacted by poor weather conditions. Travel can be difficult with heavy traffic, particularly on Interstate 93 and NH Route 117. Fortunately, these roads are the State's responsibility.

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 Highway 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.

There have been significant ice storms in New Hampshire. Sugar Hill received substantial damage in two of the most recent events, 1998 and 2008. These ice storms caused considerable loss; trees, phone lines, and structures were damaged. The Community went days to weeks before full power was restored.

Since the last hazard mitigation plan, Sugar Hill has been impacted by one debilitating winter storm event, as mentioned above, in December 2022. 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.

4 INFECTIOUS DISEASE

Hazard Identification & Risk Assessment (HIRA) ..... High
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."[20]

Infectious diseases and epidemics or pandemics present a possible threat to Sugar Hill. Sugar Hill 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 four 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.

Sugar Hill's unique geography provides hikers and summer and winter recreation enthusiasts opportunities to visit the Town; the Community's population doubles during the summer. Facilities in Sugar Hill, such as churches, meeting houses, and social facilities, hold events and activities that could increase the likelihood of spreading infectious diseases. Elementary students attend school in Franconia with students from Easton and Franconia. Middle and high school students attend school in Bethlehem with students from Bethlehem, Easton, and Franconia. 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 Sugar Hill. To help mitigate the crisis, the Town Hall remained open with mitigation measures in place. Initially, the schools went virtual. The Town continues to encourage social distancing and protecting the Town's most vulnerable citizens. There are no senior group housing facilities in Sugar Hill.

The CDC recommends that persons, particularly those who are medically compromised or over 65, receive the newest booster shot, which became available in September 2023. Recommendations for children are similar.

In coordination with emergency service personnel, Sugar Hill's EMD, and other town officials 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, because there would be no direct impact on the Town structures, the structure loss value was not estimated.

[20] Infectious diseases, Overview, https://www.mayoclinic.org/diseases-conditions/infectious-diseases/symptoms-causes/syc-20351173

5) LIGHTNING

Hazard Identification & Risk Assessment (HIRA) ..... High
Probability ..... Moderate
Estimated Structure Loss Value ..... $0 to $1,152,454

Lightning

Lightning strikes have occurred in Sugar Hill due to 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, along with 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. The Team reported that the Crapo Buiding, the Post Office, and Harmon's had been struck by lightning. Part of the Town is on Ore Hill, an area known to have iron in the ledge. Two buildings, the Crapo Building and the Meeting House, have lightning protection. The highway and fire departments do not.

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.

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

6) WILDFIRE

Hazard Identification & Risk Assessment (HIRA) ..... Medium
Probability ..... Low
Estimated Structure Loss Value ..... $1,152,454 to $5,762,270

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 the Wildland Urban Interface (WUI). 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 Sugar Hill.

The Team described the forests of Sugar Hill as consisting primarily of mixed forests. Some fires are "duff" fires, the burning of *"the layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil."*[21] 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 Sugar Hill, as they are throughout the State, but often, burning occurs without the proper permits. Sometimes, it's difficult for the fire department to monitor all conditions, and the occasional unauthorized burn will occur.

Due to the abundance of slash on the forest floor left by past ice storms 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 woods trails creates additional risks. To help mitigate the effects of wildfire, the Sugar Hill 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 department has installed dry hydrants in critical locations; without Town water, the fire department has to rely on dry hydrants, drafting sites, fire ponds, and other water sources to combat wildfires. Sugar Hill has had no significant wildfires since the last hazard mitigation plan.

Significant wildfires in New Hampshire are uncommon; six large fires have occurred in the State since 2015. These include the Bemis Fire in Crawford Notch, the Dilly Cliff Fire in Woodstock, the Covered Bridge Fire in Albany, the Bayle Mountain Fire in Ossipee, the Stoddard Fire in Stoddard, and the Centennial Fire in Shelburne. The Sugar Hill Fire Department was called to assist in the Dilly Cliff Fire.

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.

7) EXTREME TEMPERATURES

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

Extreme Cold & Heat

Winter temperatures in Sugar Hill 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. Cities and towns often 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 Sugar Hill is 30.3%, and the estimated poverty rate is 6.3% of the total population[22]. Since the prior hazard mitigation plan, no deaths or illnesses due to cold or heat have been reported in Sugar Hill.

[21] https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fswdev3_009827.pdf
[22] American Community Survey, 2021 ACS 5-Year Estimate

Extreme Temperatures combined with Long Term Utility Outage

Town officials are concerned during extreme temperatures; they look after their citizens to ensure that extreme temperatures do not create a life or property-threatening disaster. 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. Sugar Hill officials remain proactive during extreme temperatures by opening the Crapo Building as a cooling or warming center and going house to house in extreme conditions, particularly during power failures (Fire Department).

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) DROUGHT

Hazard Identification & Risk Assessment (HIRA) ..... Medium
Probability ..... Moderate
Estimated Structure Loss Value ..... $0 to $1,152,454

A drought, an extended period without precipitation, 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."*[23]

A concern is that more frequent and longer-lasting droughts will occur with climate change. In addition, drought conditions damage the local forests and farms and increase the risk of wildfire. Besides being heavily forested, Sugar Hill has open fields, although it is not a predominately agricultural community.

Only four significant droughts occurred before 2000, while three have occurred in just the past seven years (2016, 2020, and 2022). The 2016 drought did not significantly impact the residents of Sugar Hill. One lodging facility experienced higher than normal bacteria levels due to the drought, but no dry wells or other water issues were reported. During the 2020 and 2022 droughts, a few residents lost wells, and Indian Creek Brook dried up. Water for fire suppression was not impacted, and no water bans were enacted in the three most recent droughts.

The 2016-2017 drought brought extreme drought conditions in the south and dry or no drought conditions in the north. The 2020-2021 drought was less significant than the 2016 drought in southern NH but more significant in northern NH. During the summer of 2022, yet another drought impacted NH. Once again, this drought was more significant in the southern part of the state; it was over by January 2023. As of January 18, 2024, New Hampshire has no drought.[24]

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.

[23] https://www.des.nh.gov/climate-and-sustainability/
[24] https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?NH

9) TROPICAL/POST TROPICAL CYCLONES

Hazard Identification & Risk Assessment (HIRA) ..... Low
Probability ..... Very Low
Estimated Structure Loss Value ..... $1,152,454 to $5,762,270

Damaging winds due to tropical and post-tropical cyclones (hurricanes) are considered a medium risk, primarily because of Sugar Hill's abundance of forested land. Significant forest damage could occur, like during the 1938 hurricane. 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 down-graded to post-tropical cyclones when they reach northern New Hampshire.

Tropical Storm Irene, the remnants of Hurricane Irene, brought heavy rain to Sugar Hill and several partial road washouts. Ditch and culvert issues caused flooding in the usual places in Sugar Hill, but fortunately, the damage was not as significant as in other parts of New Hampshire and Vermont. It was noted that some residents in Sugar Hill lost power for a couple of days, and there was some minor basement flooding. Although underperforming culverts were replaced with FEMA funding, the replacement culverts once again failed in July 2017. Tropical Storm Sandy had no impact in Sugar Hill except for heavy rain. Since the prior hazard mitigation plan, no tropical or post-tropical cyclones have reached Sugar Hill.

As a result of tropical and post-tropical storms, hailstorms may occur. Damage from hail could result in failed crops, structure, and vehicular damage, thus creating an economic impact on individual citizens. In recent years, other communities in northern New Hampshire have experienced hailstorms due to severe thunder and lightning storms; fortunately, Sugar Hill has not experienced significant hailstorm damage and is not a farming community.

The probability that a tropical and post-tropical cyclone would remain a Category 1 or higher in this part of the State is low. However, the forest damage from a tropical storm alone could be significant. 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.

10) EARTHQUAKE

Hazard Identification & Risk Assessment (HIRA) ..... Very Low
Probability ..... Very Low
Estimated Structure Loss Value ..... $1,152,454 to $5,762,270

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 Tamworth in December of 1940 (5.5-5.8). Since then, only one earthquake with a magnitude greater than 4.0 has occurred in the State; it occurred in Sanbornton on January 19, 1982.

Many New Hampshire residents felt the most recent earthquake (4.0+) in October 2012, with its epicenter in Hollis Center, ME. The Team noted that the Hollis earthquake was felt in Sugar Hill, but no damage occurred. More earthquakes are shown in Table 3.2, which have a magnitude of 3.0 or better. Many smaller earthquakes frequently occur in New Hampshire.[25]

It is well documented that fault lines run throughout the State, but high-magnitude earthquakes have not been common 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 & HUMAN-CAUSED HAZARDS

The following 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 Sugar Hill. The estimated structure loss was not determined for these hazards.

1) LONG-TERM UTILITY OUTAGE

Hazard Identification & Risk Assessment (HIRA) ..... Very High
Probability ..... Very High

Although rare, long-term utility outages of five or more days have occurred in Sugar Hill 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 seniors, people with disabilities, or people with low incomes. The Team reported that long-term power outages have diminished due to utility companies' efforts to trim trees and branches near power lines.

Approximately one-half of the Town is supplied by Eversource, while others receive power from the NH Electric Coop. Depending on the scope of the hazard, work crews from utility companies do their best to restore power. However, the more highly populated areas of the state often receive the quickest response, leaving Sugar Hill waiting for power restoration.

Sugar Hill has been very proactive in supplying generators. Generators are located in all the Town buildings, including the Crapo Building (Town Hall), the Highway Garage, and the Fire Station. The Town also maintains a functional needs list to track those more susceptible to hazards, such as individuals on oxygen. The Town will open the Crapo Building as a cooling or warming shelter if needed, and the Fire Department will visit individuals who may need assistance.

Long-term utility outage is still a concern, particularly when combined with the above natural hazards. An extended power failure's most significant impact would be the inconvenience caused by the inability to pump water for residents who rely on wells. It is also noted that most services, including pharmacies and large grocers, are located out of town; driving during severe weather events to obtain necessities can be difficult due to poor road conditions. The Team felt that many residents are self-sufficient and are now equipped with generators and woodstoves.

[25] United States Geological Survey (USGS), Earthquake Hazards Program (https://www.usgs.gov/programs/earthquake-hazards)

As a small, close-knit community, town officials are generally aware of those residents who may need assistance during power outages and will assist them accordingly. Nonetheless, an extended power failure causing frozen pipes and a lack of heat and water is potentially a serious hazard for the Community.

2) AGING INFRASTRUCTURE

Hazard Identification & Risk Assessment (HIRA) ..... Medium
Probability ..... 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."[26]

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.[27] The American Society of Civil Engineers gave NH an overall C- in its 2017 report card.[28]

Aging infrastructure is a concern in Sugar Hill as it is throughout New Hampshire and the United States. In Sugar Hill, older roads and aging culverts are part of the Town's aging infrastructure. The town facilities, the Crapo Building (Town Hall), the Fire Station, and the Highway Garage are in good condition.

3) KNOWN & EMERGING CONTAMINANTS

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

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.

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.

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.

[26] https://www.infrastructurereportcard.org/wp-content/uploads/2016/10/2017-NH-Report-Card-hq-with-cover.pdf
[27] https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2023/11/2023-NH-STATE-HAZARD-MITIGATION-PLAN-APPENDICES-2.pdf, page 87
[28] Ibid

All of Sugar Hill's residents have private well water; thus, radon and arsenic contamination in the aquifer may be a concern. Radon is known to be in the soil. Town officials should encourage testing by individual homeowners for known and emerging contaminants.

4) CYBER EVENTS

Hazard Identification & Risk Assessment (HIRA) ..... High
Probability ..... Moderate

Presidential Policy Directive (PPD-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."*[29]

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 Team did not report any cyber-attacks, but the threat is certainly real. The Town stores essential documents on a server in the cloud at the Crapo Building; a private entity also holds an off-site server. The Community has been proactive in education and has increased the internet firewalls. Security on computer networks, off-site backup, and user education are vital to protecting sensitive town information and data.

5) MASS CASUALTY INCIDENTS

Hazard Identification & Risk Assessment (HIRA) ..... Medium
Probability ..... Low

A Mass Casualty Incident (MCI) is defined as *"any number of casualties that exceed the resources normally available from local resources"*[30]. 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.

An MCI could happen anywhere in Sugar Hill, but more likely on NH Routes 117, 18, and Interstate 93, which passes through Sugar Hill with no local exits (Franconia and Littleton). 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 Franconia and Bethlehem for elementary, middle, and high school, the potential for an MCI is increased. Fortunately, there have been no reported MCIs since the last hazard mitigation plan.

[29] PPD-41; https://obamawhitehouse.archives.gov/the-press-office/2016/07/26/presidential-policy-directive-united-states-cyber-incident
[30] DeValle Institute Learning Center; https://delvalle.bphc.org/mod/wiki/view.php?pageid=89

6) TRANSPORT ACCIDENTS

Hazard Identification & Risk Assessment (HIRA) ..... Medium
Probability ..... Low

The possibility of vehicular accidents involving hazardous materials is identified as a medium in Sugar Hill. The Town has several well-traveled roadways, including a portion of Interstate 93, NH Route 117, and NH Route 18. Large and small vehicles make deliveries to the Town's citizens, often traveling at fast speeds; the contents of some of these vehicles are unknown, while other vehicles, such as trucks hauling fuel and propane, are common.

Hazardous material transport is a particular concern because of the Town's steep, winding, and narrow roads and the possibility that drivers are unaware of the terrain. The village center is at the top of a very steep stretch of Route 117, which travels east into Franconia and west into Lisbon. Although an accident within the village would be rare, the roads to and from the village are potentially very dangerous, particularly in winter. Trucks often take Route 117 as a "short cut" to I-93 and to avoid traffic in nearby Littleton. Because of this beautiful town's bucolic and scenic nature, tour busses also often travel through the village, thus increasing the possibility for accidents and perhaps mass casualty events.

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

The Hazard Mitigation Planning Team (HMPT) reported a single incident involving hazardous materials, when a truck went off Pearl Lake Road in 2022. Speed and slippery conditions caused the crash; no injuries or hazardous materials spills occurred.

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

7) TERRORISM & VIOLENCE

Hazard Identification & Risk Assessment (HIRA) ..... Very Low
Probability ..... Very 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.*[31]

Sugar Hill has several soft targets: the Crapo Building, the Sugar Hill Meeting House, the Community Church, the Fire Station, one restaurant, and several lodging facilities.
Highways could also be targets; any closure of Interstate 93 or NH Routes 18 and 117 in Sugar Hill would cause state-wide disruptions in the transportation system. Disruption of these significant routes could affect Sugar Hill's businesses and the local economy.

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. There has been no significant terrorist or violent incident since the prior hazard mitigation plan.

[31]Homeland Security Soft Targets and Crowed Places, https://www.cisa.gov/sites/default/files/publications/DHS-Soft-Target-Crowded-Place-Security-Plan-Overview-052018-508_0.pdf

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Chapter 6: Current Plans, Policies, and 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: CAPABILITIES ASSESSMENT

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
NIMS & ICS Training	The National Incident Management System (NIMS) and the Incident Command System (ICS) provide training that can help ensure effective command, control, and communications during emergencies.	Emergency Management Director	Good	**Improvements Needed:** NIMS & ICS training has been done by most first responders. Although this is preparedness, this strategy was deferred to this Plan to continue providing NIMS (IS-700) and ICS (ICS 100 and ICS 200) training to new first responders and town officials as they become elected/appointed. **Action Item #5 (also in Table 7.1)**
Tree Removal Program	Tree Removal Program reduces damage from fallen trees and limbs to power lines, stormwater ditches, and structures. It also helps reduce the wildfire risk.	Highway Department	Good	**Improvements Needed:** As trees become damaged and threaten structures on town roads, the Road Agent removes them. As needed, the NH DOT does this for state roads, and the NH Electic Coop and Eversource remove dangerous trees around power lines. 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. Scenic Roads can sometimes inhibit the process. **Action Item #1 (also in Table 7.1)**

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Dry Hydrants & Fire Ponds	Sugar Hill Fire Department maintains hydrants. The Community has approximately four dry hydrants and multiple locations for water drafting.	Fire Department	Good	**Improvements Needed:** Dry hydrants and drafting sites throughout Sugar Hill provide water resources for firefighting. This strategy was deferred to maintain the dry hydrants and other water resources to help mitigate the effects of structure fires and wildfires and to install new water resources as time and funding allow. **Action Item #2 *(also in Table 6.1)***
CodeRED	CodeRED is a reverse calling warning system that uses landline phone numbers. CodeRED does not include cell and unlisted numbers or email addresses. SAU 35 uses "Alert Solutions", a reverse calling system for school activities and emergency notification.	Emergency Management Director	Inadequate	**Improvements Needed:** Genasys (formerly CodeRED/NH ENS) is an excellent warning system that only stores hardline-listed phone numbers. The Town has continuously provided information to residents about CodeRED in the past. This strategy was deferred to continue providing public outreach to encourage all residents to contact Genasys to add cell numbers, emails, and unlisted numbers and verify the information. Use the Town's website, a possible brochure at the town office, social media platforms, or a sign-up at Town Meeting. **Action Item #8 (also in Table 7.1)**
Site Plan & Subdivision Regulations (2023) Zoning Ordinances (2022)	Site Plan Review Regulations ensure that uses permitted by zoning are constructed on a site to fit into the area where they are being constructed without causing drainage, traffic, or lighting problems.	Planning Board & Select Board	Good	**Improvements Needed:** Sugar Hill's regulations address setbacks, road frontage, and the size of the lot. Regulations include driveways, structures, roads, erosion and sediment control, and adequate stormwater flow. This strategy was deferred to 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 to discuss changes that may mitigate the occurrence of and damage from the natural hazards identified in this Plan. This strategy was also deferred to consider adding criteria-based regulations requiring water availability for fire suppression in new subdivisions and to review the maximum width, length, and slope of roads. **Action Item #23 (also in Table 7.1)**
Emergency Operation Plan (2020)	An Emergency Operations Plan identifies the response procedures and capabilities of Sugar Hill in the event of a natural, technological, or human-caused hazard.	Emergency Management Director	Good	**Completed & Deferred:** The Sugar Hill Emergency Operations Plan (EOP) was last updated in 2020 and will not be ready for an update until 2025 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. This strategy was deferred to this Plan to update the EOP. **Action Item #28 (also in Table 7.1)**

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Public Education & Awareness	Sugar Hill is well situated to provide public information and outreach to its citizens.	Emergency Management Director & Other Departments	Inadequate	**Improvements Needed:** The Town has developed a useful Emergency Management and Preparedness webpage, accessible under departments on the Town's website. An emergency web page is a great way to provide outreach to residents on emergency preparedness and mitigation techniques property owners can use to reduce or eliminate the impact of natural hazards. This strategy was deferred to this Plan to continue to develop and provide vital information and links on the Emergency Management tab to educate the public on general and seasonal mitigation techniques. The Town could also use established social media platforms to release information to residents (see Table 2.1). **Action Item #7 (also in Table 7.1)**
National Flood Insurance Program (NFIP) & Floodplain Ordinance (stand-alone document)	The National Flood Insurance Program (NFIP) addresses both the need for flood insurance and the need to lessen the devastating consequences of flooding. 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 Sugar Hill are dated February 20, 2008.	Planning Board & Select Board	Good	**Improvements Needed:** The Town developed a flood ordinance and became a National Flood Insurance Program (NFIP) member on April 2, 1986. 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. The Flood Ordinance was last amended in 2007. 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 or not properties are in the FEMA floodplain. This strategy was also deferred to provide vital 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 #9 (also in Table 7.1)**
Bridge Maintenance Program	There are currently two red-listed bridges in the Community. Inspection and clean-up of bridges occur annually. The State inspects all bridges every other year and maintains them regularly.	Highway Department	Good	**Improvements Needed:** The Sugar Hill Highway Department has established a short and long-term bridge maintenance and replacement schedule. Two red-listed bridges, Streeter Pond Bridge and Crane Hill Road Bridge, are included as action items in this Plan. **Action Items #13 & 25 (also in Table 7.1)**

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Culvert & Stormwater Maintenance Plan	A Culvert & Storm Water Maintenance Plan includes an inventory of all culverts and ditches in the Community and a record of the location, size, etc. The Sugar Hill Highway Department and the NH DOT clean the drainage basins once a year, and after significant flooding events, culverts are repaired as needed.	Highway Department	Good	**Improvements Needed:** Although the Road Agent does an excellent job cleaning and repairing drainage basins and culverts, a written Culvert & Stormwater Maintenance Plan should be developed to ensure continuity of actions and efficient stormwater management. This strategy was deferred to develop a written Culvert & Stormwater Maintenance Plan detailing the size, material, installation date, recommended date for improvement, GPS location, and any associated problems (i.e., flooding). Several culverts and drainage systems in the Town need improvement. **Action Item #22 (also in Table 7.1)**
E- 911 Signage Compliance	E-911 signage compliance includes markers at driveway entrances that identify residence locations in conjunction with the E-911 alerting system.	Fire Department, Police Department, Highway Department & Others	Excellent	**Improvements Needed:** Sugar Hill is about 90% compliant with E-911 signage. This strategy was deferred to this Plan to consider ways to get this signage more compliant so that emergency responders can better assist the public in need. Use public outreach opportunities such as an Emergency Management webpage or social media to promote better compliance and develop other means of increasing compliance. The Town purchases and installs signage, which accounts for an excellent percentage of signs in the Town. **Action Item #4**
All Hazard Response Training Fire, HazMat, EMS & Police Department	Fire, HazMat, and EMS personnel training for all situations, including wildfire suppression, medical emergencies, and HazMat response. Police Department personnel training for law enforcement response, including active shooter and terrorism.	Fire Chief, Fire Warden, EMS Director, Police Chief & Emergency Management Director	Excellent	**Improvements Needed:** Training of all fire responders includes many aspects of emergency response, including EMS, confined space, wildfire, and HazMat training. Fire & EMS training is done locally or through Twin State Fire Mutual Aid, the State of New Hampshire Fire & EMS Training Facility, or the Fire Academy. Police training includes many aspects of law enforcement response, including active shooter and terrorism. Police training is done locally or through the NH Police Academy. Although training is preparedness, not mitigation, emergency responder training was deferred to continue for the life of the Plan. **Action Item #6**

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Sugar Hill Hazard Mitigation Plan (2017)	A hazard mitigation plan is designed to address natural, technological, and human-caused hazards and understand the risk these pose to 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 Sugar Hill Hazard Mitigation Plan (2017) is being updated to this Plan. This strategy was deferred to review this Plan, the Sugar Hill Hazard Mitigation Plan 2023, annually and to update the Plan again in 2028. **Action Item #16**
Master Plan (2023)	A Master Plan includes goals, objectives, and expectations for the future development of the Town.	Planning Board	Inadequate (due to age)	**Improvements Needed:** The Sugar Hill Master Plan is currently being updated. This strategy was deferred to update the Master Plan according to the State's 10-year recommendation and consider integrating a natural hazards section, a discussion on climate change, and action items from this Plan in future updates. **Action Item #24**
Radio Communications	Radio communications are vital for emergency response to all types of hazards. Radios should be interoperable and up-to-date with current technology.	Emergency Management Director	Good	**Improvements Needed:** All three emergency departments in Sugar Hill (Police/Fire/Highway Departments) have radio interoperability and new radios due to an ARPA grant. Communications systems and radios are updated with state and federal requirements and work as intended. There are areas of the Town that have "dead spots". This strategy was deferred to obtain a better antenna at the Crapo Building and add repeaters, at least in all Police Department vehicles. **Action Item #14**
Local Road Design Standards	Local road design standards are specifications for constructing new roads in a community.	Planning Board & Highway Department	Good	**Improvements Needed:** Local road standards have been established to provide specifications for building new roads to ensure that the Town does not assume ownership of substandard roads. The Town will not assume ownership of roads not built to Class V standards. Acceptance of new roads is voted at Town Meeting as a Warrant Article. This strategy was deferred to consider changes in the regulations that would mandate more stringent paving requirements for new subdivisions, perhaps mandating that the entire new subdivisions be paved. **Action Item #26**

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Emergency Generators	Sugar Hill has emergency backup power at many of the Town's Critical Infrastructure & Key Resources (CIKR), including the Crapo Building (Town Office and Police Station), the Highway Garage, and the Fire Station. The Meeting House, a potential shelter, would benefit from a generator.	Emergency Management Director	Good	**Improvements Needed:** Sugar Hill has emergency backup power at most of the Town's Critical Infrastructure & Key Resources (CIKR), including the Crapo Building (Town Office and Police Station), the Highway Garage, and the Fire Station. The Meeting House, the secondary shelter, does not have a generator. This strategy was deferred to obtain and install a permanent generator at this important CIKR. **Action Item #27**
Burning Index	New Hampshire Forests & Lands (DNCR) has a burning index that measures the risk for wildfires 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 them, and the type of equipment that might be needed.	NH Hampshire Forests & Lands (DNCR) & Fire Department	Good	**Improvements Needed:** The Fire Department receives regular notification of the burning index via email from NH Forests & Lands. This notification is made daily during the fire danger season. The Fire Department is well-prepared and will not issue burn permits on fire danger days. This strategy was deferred to purchase and install a Fire Danger sign at the Fire Station. **Action Item #21**
Building Code & Permits	The Town has not adopted International Building Codes (IBC) and International Residential Codes (IRC). The Town does require builders to follow the state-adopted codes for new construction so that national standards for flood, wind, earthquake, fire, and snow load are met.	Select Board & Planning Board	Good	**No Improvements Needed:** Sugar Hill has a Building Inspector. The permitting process requires builders to abide by the International Building Codes (IBC) and the International Residential Codes (IRC), which the State of New Hampshire has adopted. Building fire and electric codes are approved by the Select Board.
Capital Reserve Fund (CRF)	A Capital Reserve fund is an account on a town's balance sheet reserved for long-term capital investment projects or any other significant and anticipated expense(s) that will be incurred. Reserve funds are set aside to partially ensure adequate funding to finance future projects, equipment, and other expenditures.	Select Board	Excellent	**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 Sugar Hill Capital Reserve Funds work well and are part of the Town Warrant at the annual Town Meeting.

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.	Police Department, Fire Department & Emergency Management Director	Good	**No Improvements Needed:** SAU 35 and the Lafayette School District complete school Emergency Operations Plans annually according to state requirements. The Profile High School and the Lafayette Regional School have current plans updated according to the State's requirements. Drills and exercises are done annually and include the participation of the Town's emergency responders.
Shoreland Water Quality Protection Act (formerly the Comprehensive Shoreland Protection Act)	The Shoreland Water Quality Protection Act (SWQPA) establishes minimum standards for the use and development of shorelands adjacent to the State's public water bodies.	State of NH	Excellent	**No Improvements Needed:** Sugar Hill follows the Shoreland Water Quality Protection Act regulations. Compliance with the Act is encouraged.
Mutual Aid Agreements (Fire, Police, Highway & EMS)	Mutual Aid agreements provide communications capabilities and cooperative assistance between area cities and towns; mutual aid provides access to resources appropriate to the scope of the emergency.	Police Department, Fire Department & Highway Department & EMS	Excellent	**No Improvements Needed:** The Sugar Hill Fire Department has a mutual aid agreement with the Twin State Fire Mutual Aid. The Sugar Hill Police Department has mutual aid written agreements with surrounding towns and a mutual understanding with the NH State Police (Troop F), US Border Patrol, the Grafton County Sheriff's Office, and Fish & Game. The Highway Department is a NH Public Works Mutual Aid Association member. The Sugar Hill Fire Department works with Littleton Fire Rescue to provide EMS services and medical transportation. All mutual aid systems in Sugar Hill work well.
State Health Department Public Health Plan	The state health department wrote the "Influenza, Pandemic, Public Health Preparedness, and Response Plan" to be prepared for any public health emergency; the Town 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 the services provided by the North Country Regional Public Health Network. The Sugar Hill Health Officer attends public health meetings whenever possible.
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	Excellent	**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).

Current Program or Activity	Description	Managing Department	How Effective	Improvements Needed
Life Safety & Fire Codes	Guides all buildings for life safety and fire codes	Fire Department	Excellent	**No Improvements Needed:** The National Fire Protection Association (NFPA) and the NH safety and fire codes guide the Sugar Hill Fire Department to inspect all commercial and public assemblies and all new construction before obtaining a Certificate of Occupancy. The Sugar Hill Fire Department does its best to provide timely inspections based on available staffing.
Emergency Action Plan (Dams)	Dam Emergency Action Plans are designed to notify and outline evacuation procedures should a dam failure occur.	Department of Environmental Services (DES)	Excellent	**No Improvements Needed:** There are no high-hazard dams in Sugar Hill that would require a dam emergency action plan. Two dams, one low-hazard, and the other non-menace, are owned by the Department of Environmental Services (DES), and two others are small privately-owned non-menace dams. Two dams, the Coffin Pond and the Streeter Pond dam, can potentially flood Lisbon areas.

Chapter 7: Last Mitigation Plan

A. DATE OF LAST PLAN

Based on the Disaster Mitigation Act (DMA) of 2000, Sugar Hill has developed hazard mitigation plans in the past. The most recent update was formally approved in 2017. The Sugar Hill Hazard Mitigation Plan Update 2024 updates the 2017 plan.

Below are the action items that were identified in the 2017 plan. The Team identified the current status of each strategy based on three sets of questions:

COMPLETED

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

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?

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.

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 2017 Hazard Mitigation Plan. Additional columns not shown here – Hazard Addresses, Responsible Department, Funding or Support, Time Frame, and Est. Cost – can be found in the 2017 Hazard Mitigation Plan.

TABLE 7.1: ACCOMPLISHMENTS SINCE THE LAST PLAN

Rank	New Mitigation Project	Completed, Deleted, or Deferred
0-1	**Action Item #1:** Encourage all town officials and new hires to take NIMS 700 and ICS 100 and 200. **(Tables 6.1 & 7.1)**	**Completed & Deferred:** NIMS & ICS training has been done by most first responders. Although this is preparedness, this was deferred to this Plan to continue providing NIMS (IS-700) and ICS (ICS 100 and ICS 200) training to new first responders and town officials as they become elected/appointed. Fire Department members have taken ICS 100 and 200; the Fire Chief is up-to-date with ICS 300 and 400. **Action Item #5 (also in Table 6.1)**
0-2	**Action Item #2:** Continue program to mow roadsides and cut limbs and branches in an effort to mitigate the effects of wind damage to power lines and structures and to ensure defensible space for mitigating wildfires; continue tree maintenance program to reduce or eliminate the damage that may result during a natural hazard such as a wildfire, windstorm, hurricane or tropical storm. **(SW4 & WF7) (Table 6.1)**	**Completed & Deferred:** As trees become damaged and threaten structures on town roads, the Road Agent removes them. As needed, the NH DOT does this for state roads, and the NH Electic Coop and Eversource remove dangerous trees around power lines. 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. Scenic Roads can sometimes inhibit the process. **Action Item #1 (also in Table 6.1)**

Rank	New Mitigation Project	Completed, Deleted, or Deferred
0-3	**Action Item #3:** Routinely inspect the functionality of fire hydrants and continue the maintenance of all hydrants and other water resources in Sugar Hill. **(WF8) (Table 7.1)**	**Completed & Deferred:** Dry hydrants and drafting sites throughout Sugar Hill provide water resources for firefighting. The Fire Department maintains five dry hydrants and draft sites. This strategy was deferred to maintain the dry hydrants and other water resources to help mitigate the effects of structure fires and wildfires and to add additional dry hydrants as time and funding become available. **Action Item #2 (also in Table 6.1)**
0-5	**Action Item #5:** Provide continuous public outreach to encourage all residents to contact CodeRED and NH ENS to add cell numbers, emails and unlisted numbers and to verify information; use the website, a possible mailing, the Town Report or a sign-up at Town Meeting. **(MU14) (Tables 6.1 & 7.1)**	**Completed & Deferred:** Genasys (formerly CodeRED/NH ENS) is an excellent warning system that only stores resident hardline phone numbers. The Town has continuously provided information to residents about CodeRED in the past. This strategy was deferred to continue providing public outreach to encourage all residents to contact Genasys to add cell numbers, emails, and unlisted numbers and verify the information. Use the Town's website, a possible brochure at the town office, social media platforms, or a sign-up at Town Meeting. **Action Item #8 (also in Table 6.1)**
0-6	**Action Item #6:** Review Sugar Hill's subdivision regulations to consider adding regulations to address driveways on steep slopes so that access by emergency responders can be maintained. **(MU7, WF3 & F1) (Table 6.1)**	**Completed, Deleted, or Deferred:** Sugar Hill's regulations address setbacks, road frontage, and the size of the lot. There are also regulations for driveways, structures, and roads, erosion, sediment control, and maintaining adequate stormwater flow. This strategy was deferred to 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 to discuss changes that may mitigate the occurrence of and damage from the natural hazards identified in this Plan. This strategy was also deferred to consider adding criteria-based regulations requiring water availability for fire suppression in new subdivisions and to review the maximum width, length, and slope of roads. **Action Item #23 (also in Table 6.1)**
0-7	**Action Item #7:** Establish an interactive emergency webpage for educating the public on hazard mitigation and preparedness measures (MU14) by adding to the Town's Emergency Management Services a webpage 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)**	**Deferred:** The Town has developed a useful Emergency Management and Preparedness webpage, accessible under departments on the Town's website. An emergency web page is a great way to provide outreach to residents on emergency preparedness and mitigation techniques property owners can use to reduce or eliminate the impact of natural hazards. This strategy was deferred to this Plan to continue to develop and provide vital information and links on the Emergency Management tab to educate the public on general and seasonal mitigation techniques. The Town could also use established social media platforms to release information to residents (see Table 2.1). **Action Item #7 (also in Table 6.1)**
0-8	**Action Item #8:** 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 or provide mailing materials. **(Tables 6.1 & 7.1)**	**Deferred:** The Town became a National Flood Insurance Program (NFIP) member on April 2, 1986. The Town's Flood Ordinance, developed in 2007, 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 or not properties are in the FEMA floodplain. This strategy was also deferred to provide vital 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 #9 (also in Table 6.1)**

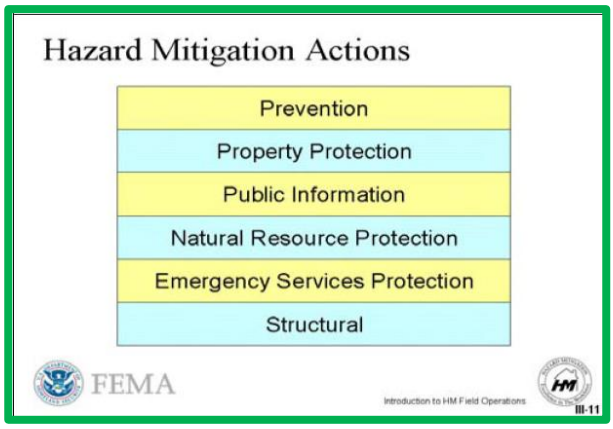
Rank	New Mitigation Project	Completed, Deleted, or Deferred
2-3	**Action Item #12:** Develop a written stormwater maintenance plan in order to ensure more efficient stormwater management; include an inventory of culverts, drains, etc. along with a record of size, type and expected length of service. **(F5) (Table 7.1)**	**Deferred:** Although the Road Agent does an excellent job cleaning and repairing drainage basins and culverts, a written Culvert & Stormwater Maintenance Plan is being developed to ensure continuity of actions and efficient stormwater management. This strategy was deferred to complete developing a written Culvert & Stormwater Maintenance Plan detailing the size, material, installation date, recommended date for improvement, GPS location, and any associated problems (i.e., flooding). **Action Item #22 (also in Table 6.1)**
0-4	**Action Item #13:** Update the Emergency Operations Plan (EOP) to increase the Town's ability to respond to disasters and to mitigate future or continued occurrences; consider elements in this hazard mitigation plan when updating the EOP, update the EOP to the 15-Emergency Support Function (ESF) format and make Player Packets for Lead Agencies. **(MU6) (Tables 6.1)**	**Completed & Deferred:** The Sugar Hill Emergency Operations Plan (EOP) was last updated in 2020 and will not be ready for an update until 2025 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. This strategy was deferred to this Plan to update the EOP. **Action Item #28 (also in Table 6.1)**
1-2	**Action Item #11:** Replace the red-listed Streeter Pond Bridge using FEMA funding as available after the July 1, 2017 flooding event.	**Deferred:** The red-listed Streeter Pond Bridge project was not completed as suggested in the prior hazard mitigation plan. A bridge installed in 2015 has caused flooding issues; it is too small, and water overtops it. This strategy was deferred to install a wider and longer bridge to increase the stormwater flow. **Action Item #13 (also in Table 6.1)**
2-2	**Action Item #15:** Replace the red-listed Crane Hill Road Bridge.	**Partially Completed & Deferred:** The Crane Hill Road Bridge has not yet been replaced; however, the Town is working on the project. This strategy was deferred to replace this red-listed and rusted bridge with a new and wider bridge; flooding issues result when gravel bars catch the ice and cause an ice jam and subsequent flooding. **Action Item #25 (also in Table 6.1)**
0-4	**Action Item #4:** Continue to maintain Sugar Hill's voluntary database of the functional needs population, such as those individuals at high risk of death, the elderly, the homeless, etc.; include next of kin notification or other persons who can assist if needed; maintain functional needs list based on HIPAA**. (ET3 & WW6) (Table 7.1)**	**Completed & Deferred:** The Town has established a functional needs list. This ongoing strategy was deferred to update and maintain the functional needs list in cooperation with the Fire and Police Departments. **Action Item #3**
0-9	**Action Item #9:** 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) (Table 7.1)**	**Completed & Deferred:** The Town has done an excellent job reminding residents of the local fire danger, but more can be done. The strategy was deferred to promote structure fire and wildfire mitigation on the town's website and obtain and have available Firewise® brochures to educate homeowners on wildfire mitigation. Add a Firewise® link to the website and provide Firewise® brochures to those residents seeking burn permits (if not obtained online). **Action Item #10**
1-1	**Action Item #10:** Replace the damaged or failed culverts from the July 1, 2017 rain event on the following roads: Bickford Hill Road, Birches Road, Blake Road, Carpenter Road, Crane Hill Road, Creamery Pond Road, Dyke Road, Easton Road, Grandview Road, Hadley Road, Jericho Road, Kathy Rae Drive, Lafayette Road, Lovers Lane, Pearl Lake Road, Post Road, Presby Road, South Road, Streeter Pond Road, Sunset Hill Road, Toad Hill Road and Valley Vista Road to improve the flow of stormwater and mitigate against future flooding; use FEMA Presidential Disaster Declaration funding if it becomes available. **(FU13)**	**Completed or Deferred:** All but five of the numerous culverts listed in the prior hazard mitigation plan damaged in 2017 have been improved. The five remaining culverts need upgrades to improve stormwater flow: Crane Hill, Creamery Pond, Easton, Hadley, and Streeter Pond Roads. **Action Items #17, #18, #19 & #20**

Rank	New Mitigation Project	Completed, Deleted, or Deferred
1-1	**Action Item #14:** Upon receipt of final approvals, dredge the Gale River to clean up the silt build up on the bottom, to prevent scouring of the Streeter Pond Bridge and to mitigate flooding on Streeter Pond Road and NH Route 18. **(F14, F19 & F20) (Table 7.1)**	**Partially Completed & Deferred:** Dredging of the Gale River to prevent Crane Hill Road bridge from scouring was completed in the past, but the issue of enlarged gravel bars causing ice jams has returned. This strategy was deferred to find a solution for the scouring problem to help eliminate the potential for ice jam flooding on NH Route 18. DES will not allow dredging, so other solutions are needed. **Action Item #29**
3-1	**Action Item #16:** As recommended in the Fire Pond Plan, fire ponds should be constructed/installed at Streeter Pond Road, Toad Hill Road, NH Route 117 @ South Road, Hadley Road and Center District Road in order to better ensure the effectiveness of fire suppression to mitigate and control wildfires; dredge where needed (Route 117 and Birches) in order to install fire ponds and dry hydrants. **(WF3) (Table 7.1)**	**Partially Completed & Deferred:** Not all recommended dry hydrants were installed as suggested in the prior hazard mitigation and Fire Pond plans. Toad Hill Road is operational; others need dredging to make them more efficient. This strategy was deferred to find additional water drafting sites, install dry hydrants as appropriate, and continue maintenance on current and future drafting sites and hydrants. This strategy is combined with Action Item #3 in the old Plan. See **Action Item #2** in this Plan.

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 Sugar Hill, 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 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 650 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 Sugar Hill 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 Sugar Hill 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 high grass and other fuel loads in the Community. **(SW4, WF7, WF9 & F14) (Tables 6.1 & 7.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	2	3	3	3	20
		Political: *Scenic Roads have special criteria for cutting*							
Action Item #2: Inspect the functionality of dry hydrants, drafting sites, and other water resources in Sugar Hill. Consider other areas with limited water resources and address these issues by installing new hydrants, fire ponds, and cisterns to help mitigate the effects of wildfires as time and funding become available. **(WF8, MU12 & MU13) (Tables 6.1 & 7.1)**	**Affected Location** -Areas of town without water resources -Dry Hydrants -Water resources **Type of Activity** -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 #3: Update the Town's existing database to track those individuals at high risk of death, such as the elderly, homeless, etc. **(ET3 & WW6) (Table 7.1)**	**Affected Location** -Functional Needs Population **Type of Activity** -Prevention -Public Education & Awareness -Emergency Service Protection	3	3	3	2	3	3	3	20
		Political: *Some people may be reluctant to be on the list*							

Proposed Mitigation Action Items	Type of Activity	S	T	A	P	L	E	E	TTL
		3	3	3	2	3	3	3	20
Action Item #4: Consider ways to get E-911 signage more compliant so that emergency responders can better assist the public in need. Use public outreach opportunities such as an Emergency Management webpage or social media to promote better compliance. **(Emergency Preparedness)** **(Table 6.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Public Education & Awareness -Emergency Service Protection	***Political:*** *Some people may not want them and will remove them*							
		3	3	3	3	3	3	3	21
Action Item #5: 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) and ICS (ISC100 and ISC200). Additionally, the EMD should encourage key personnel to learn about and become adept with WEB-EOC. **(Tables 6.1 & 7.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Emergency Service Protection	*No apparent difficulty with this action item*							
		3	3	3	3	3	3	3	21
Action Item #6: Provide training for all hazard response, including wildfire suppression, HazMat, EMS, Confined Space, Active Shooter, and other Law Enforcement training. **(Emergency Preparedness)** **(Table 6.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Emergency Service Protection	*No apparent difficulty with this action item*							
		3	3	3	3	3	3	3	21
Action Item #7: Provide robust information on an emergency management 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 strategies for droughts, earthquakes, tornadoes, severe winter weather, lightning, and climate change. Provide information on infectious diseases, encourage homeowners to install carbon monoxide monitors and alarms, and monitor radon in their homes. Offer residents and business owners reminders to clear snow from roofs during high accumulation snow years. **(MU14, SW7, WF11, D9, T3, EQ7, ET1, ET4, L2, HA3, WW5)** **(Tables 6.1 & 7.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Public Education & Awareness -Property Protection	*No apparent difficulty with this action item*							
		3	3	3	3	3	3	3	21
Action Item #8: Provide public outreach to encourage all residents to contact Genasys (formerly CodeRED/NH ENS) to add cell numbers, unlisted numbers, and emails and verify their information. Use the Community website, a possible brochure, available social media platforms, local newsletters, or a sign-up at Town Meeting. **(MU14)** **(Tables 6.1 & 7.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Public Education & Awareness -Emergency Service Protection	*No apparent difficulty with this action item*							
		3	3	3	3	3	3	3	21
Action Item #9: Advise the public about the local flood hazard, flood insurance, and flood protection measures **(F10)** by obtaining and keeping a supply of National Flood Insurance (NFIP) brochures in the Town Hall. Give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance **(F22)** if they are in the flood zone. 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 a Town's Emergency Management webpage, a possible brochure, available social media platforms, and 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	*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: Post important information on a Town's Emergency Management webpage and notices of red flag burning days. Obtain and have available Firewise® brochures to educate homeowners on methods to reduce fire risk around their homes **(WF10)** and provide a link to Firewise® on the Emergency page if established. Provide Firewise® brochures to those residents seeking burn permits (if not obtained online). Advise residents on the importance of maintaining defensible space and removing dead or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches, and yards. **(WF12)** **(Table 7.1)**	**Affected Location** -Townwide **Type of Activity** -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 #11: Provide public outreach to the citizens of Sugar Hill regarding the availability of the Crapo Building as a "cooling or warming center" during extended high temperatures and severe winter weather. **(ET3 & WW6)**	**Affected Location** -Crapo Building **Type of Activity** -Prevention -Public Education & Awareness	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #12: To promote private mitigation efforts, provide public outreach to the citizens of Sugar Hill on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. This maintenance will help ensure accessibility for emergency response and decrease the wildfire risk. **(MU16)**	**Affected Location** -Private Roads **Type of Activity** -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: Improve the "red-listed" Streeter Pond Bridge as soon as state funding becomes available. The new bridge should be wider, longer, and angled to increase stormwater flow. This bridge is planned to be upgraded in 2023-24. **(MU13)** **(Tables 6.1 & 7.1)**	**Affected Location** -Streeter Pond Bridge **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	1	3	3	2	2	2	2	15
		Social: *Traffic inconveniences; 5-day closure* ***Technical:*** *Mixed with highway & contractor* ***Administrative:*** *Will need to hire a contractor* ***Political:*** *Easements need to be done* ***Legal:*** *Easements need to be done* ***Economical:*** *Budget constraints* ***Environmental:*** *DES involved*							
Action Item #14: Obtain a better antenna for the Town Hall and add repeaters, at least in all Police Department vehicles. **(Emergency Preparedness)** **(Table 6.1)**	**Affected Location** -Town Hall **Type of Activity** -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #15: Obtain approval of this Plan as a Community Wildfire Protection Plan (CWPP) to enable potential assistance from the State and Federal governments for future wildfire mitigation projects. **(WF2)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #16: Provide an annual review of the Sugar Hill 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 update of the Plan in five years. **(MU11)** **(Table 6.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention	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 #17: Improve stormwater flow and prevent inland flooding by raising Crane Hill Road 3-4 feet and improving ditching to prevent ice buildup and river overflow. **(F13) (Table 7.1)**	**Affected Location** -Crane Hill Road Culvert **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	3	3	3	3	3	3	1	19
		Environmental: *DES will be involved*							
Action Item #18: Improve the flow of stormwater and prevent inland flooding by upgrading the culvert on Creamery Pond Road from a 36" squash (a culvert that looks like an egg) to a 60" squash and clean out the stream bed at both ends of the pipe. **(F13) (Table 7.1)**	**Affected Location** -Creamery Pond Road Culvert **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	3	3	3	3	3	3	2	20
		Environmental: *DES permitting will be needed*							
Action Item #19: Improve the stormwater flow and prevent inland flooding by upgrading the culvert on Easton Road with an additional 4' pipe to be installed next to the one currently there. Improve the culverts to a 60" x 7' squash. **(F13) (Table 7.1)**	**Affected Location** -Easton Road Culvert **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #20: Improve stormwater flow and prevent inland flooding by upgrading the undersized and damaged Hadley Road culvert from a 60" metal culvert to a 7' squash. **(F13) (Table 7.1)**	**Affected Location** -Hadley Road Culvert **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	3	3	3	3	3	3	2	20
		Environmental: *DES permit*							
Action Item #21: Purchase and install a Fire Danger sign at the Fire Station. **(WF11) (Table 6.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Public Education & Awareness -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #22: 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)**	**Affected Location** -Culverts & Ditches **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
		Administrative: *Staff time may be an issue*							
Action Item #23: Review the Sugar Hill Subdivision, Zoning, and Site Plan Regulations to consider changes that will enhance mitigation efforts across the Community. Update these planning mechanisms and integrate elements from this Plan where possible. Assess the impact of Climate Change in areas of known hazards and determine if regulatory changes can mitigate future issues. Consider adding criteria-based regulation requiring availability for fire suppression in new subdivisions. **(WF2, F1 & MU6) (Tables 6.1 & 7.1)**	**Affected Location** -Townwide **Type of Activity** -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 #24: Review this Plan, the Sugar Hill Hazard Mitigation Plan Update 2024, when reviewing and updating the Master Plan. Consider incorporating a discussion on climate change, a natural hazards section, and mitigation action items from this Plan. **(MU6) (Table 6.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #25: Improve the "red-listed" Crane Hill Road Bridge as soon as state funding becomes available. The bridge should be raised, widened, and repaired. **(MU13) (Tables 6.1 & 7.1)**	**Affected Location** -Crane Hill Road Bridge **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	1	3	3	2	2	2	3	16
		Social: *Traffic inconveniences; 5-day closure* ***Technical:*** *Mixed with Highway & contractor* ***Administrative:*** *Hiring contractor* ***Political:*** *Easements need to be done* ***Legal:*** *Easements need to be done* ***Economical:*** *Budget constraints* ***Environmental:*** *DES is involved*							
Action Item #26: Consider changes in the subdivision regulations that would mandate more stringent paving requirements for new subdivisions, perhaps mandating that the entire new subdivisions be paved to reduce the impact of road flooding and road washouts. **(F1 & F6) (Table 6.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Property Protection -Natural Resource Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #27: Obtain funding and install a permanent generator at the Sugar Hill Meeting House, a designated Secondary Shelter, to ensure the continuation of government during a disaster. **(Emergency Preparedness) (Table 6.1)**	**Affected Location** -Sugar Hill Town Office **Type of Activity** -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #28: Update the Sugar Hill Emergency Operations Plan to coincide with the new state 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 should include an EOC Call Alert List, a detailed Resource Inventory List, and Player Packets. **(MU6) (Tables 6.1 & 7.1)**	**Affected Location** -Townwide **Type of Activity** -Prevention -Emergency Service Protection	3	3	3	3	3	3	3	21
		No apparent difficulty with this action item							
Action Item #29: Find a solution for the scouring problem at the Crane Hill Bridge over the Gale River to help eliminate the potential for ice jam flooding on Streeter Pond Road. **(F5, F13 & F19) (Table 7.1)**	**Affected Location** -Crane Hill Road **Type of Activity** -Prevention -Emergency Service Protection -Property Protection -Natural Resource Protection -Structural Project	3	3	3	3	1	1	1	15
		Legal: *Need DES permission to dredge* ***Economical:*** *Budget Constraints* ***Environmental:*** *DES permission will be needed*							

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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 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 Plan.....Starting on Plan adoption 2024-2029 (0-60 months)
Short Term.....1 year 2024-2025 (0-12 months)
Medium Term.....2 years starting in 2025 – 2027 (12 – 36 months)
Long-term .....3 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	***Problem Statement:*** *As trees become damaged and threaten structures on town roads, the Highway Department removes them. NH DOT does this for state roads and powerlines along with NH Electric Coop and Eversource. There is a need to continue to work to keep this hazard to a minimum.* **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 high grass and other fuel loads in the Community. **(SW4, WF7, WF9 & F14) (Tables 6.1 & 7.1)**	High Wind Events, Wildfire, Severe Winter Weather & Inland Flooding	Highway Department & Building & Grounds	Local	Life of the Plan	Low Cost
A-2	***Problem Statement:*** *The Fire Department tests and maintains dry hydrants and drafting sites to ensure their use for fire suppression. Hydrant and site maintenance are needed to ensure water availability while fighting wildfires or conflagrations.* **Action Item #2:** Inspect the functionality of dry hydrants, drafting sites, and other water resources in Sugar Hill. Consider other areas with limited water resources and address these issues by installing new hydrants, fire ponds, and cisterns to help mitigate the effects of wildfires as time and funding become available. **(WF8, MU12 & MU13) (Tables 6.1 & 7.1)**	Wildfire	Fire Department	Local	Life of the Plan	Very Low Cost
A-3	***Problem Statement:*** *A survey was done to identify the functional needs population in Sugar Hill. Although a list of the functional needs population exists and is updated to date, maintenance of this list should continue.* **Action Item #3:** Update the Town's existing database to track those individuals at high risk of death, such as the elderly, homeless, etc. **(ET3 & WW6) (Table 7.1)**	Extreme Temperatures & Severe Winter Weather	Fire Department & Police Department	Local	Life of the Plan	Very Low Cost
A-4	***Problem Statement:*** *Sugar Hill is about 90% compliant with E-911 signage. Although this is very good, compliance can still be improved.* **Action Item #4:** Consider ways to get E-911 signage more compliant so that emergency responders can better assist the public in need. Use public outreach opportunities such as an Emergency Management webpage or social media to promote better compliance. **(Emergency Preparedness) (Table 6.1)**	All Hazards	Town Administrator, Emergency Management Director, Fire Department, & Police Department	Local	Life of the Plan	Very Low Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-5	***Problem Statement:*** *Although first responders, including firefighters, have received NIMS and ICS training, not all Sugar Hill town officials have.* **Action Item #5:** 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) and ICS (ISC100 and ISC200). Additionally, the EMD should encourage key personnel to learn about and become adept with WEB-EOC. **(Tables 6.1 & 7.1)**	All Hazards	Emergency Management Director	Local	Life of the Plan	Very Low Cost
A-6	***Problem Statement:*** *Training of all fire responders includes many aspects of emergency response, including EMS, confined space, wildfire, and HazMat training. Fire & EMS training is done locally or through Twin State Fire Mutual Aid, the State of New Hampshire Fire & EMS Training Facility, or the Fire Academy. Police training includes many aspects of law enforcement response, including active shooter and terrorism. Police training is done locally or through the NH Police Academy. Training should continue.* **Action Item #6:** Provide training for all hazard response, including wildfire suppression, HazMat, EMS, Confined Space, Active Shooter, and other Law Enforcement training. **(Emergency Preparedness) (Table 6.1)**	All Hazards	Police Department & Fire Department	Local	Life of the Plan	Very Low Cost
A-7	***Problem Statement:*** *The Town can provide public outreach via social media platforms or its newsletter, and there is an emergency management webpage. Public outreach should continue.* **Action Item #7:** Provide robust information on an emergency management 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 strategies for droughts, earthquakes, tornadoes, severe winter weather, lightning, and climate change. Provide information on infectious diseases, encourage homeowners to install carbon monoxide monitors and alarms, and monitor radon in their homes. Offer residents and business owners reminders to clear snow from roofs during high accumulation snow years. **(MU14, SW7, WF11, D9, T3, EQ7, ET1, ET4, L2, HA3, WW5) (Tables 6.1 & 7.1)**	High Wind Events, Drought, Earthquake, Extreme Temperatures, Lightning, Severe Winter Weather, Wildfire & Infectious Disease	Administrative Assistant & Department Heads	Local	Life of the Plan	Very Low Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-8	***Problem Statement:*** *Genasys (formerly CodeRED/NH ENS) is an excellent warning system, but it only stores resident landline phone numbers. Residents may not be aware that they can add cell numbers, emails, and unlisted numbers.* **Action Item #8:** Provide public outreach to encourage all residents to contact Genasys to add cell numbers, unlisted numbers, and emails and verify their information. Use the Community website, a possible brochure, available social media platforms, local newsletters, or a sign-up at Town Meeting. **(MU14) (Tables 6.1 & 7.1)**	All Hazards	Emergency Management Director & Administrative Assistant	Local	Life of the Plan	Very Low Cost
A-9	***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 may also not be aware of the risk of building in the floodplain and the steps they can take to reduce flooding.* **Action Item #9:** Advise the public about the local flood hazard, flood insurance, and flood protection measures **(F10)** by obtaining and keeping a supply of National Flood Insurance (NFIP) brochures in the Town Hall. Give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance **(F22)** if they are in the flood zone. 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 a Town's Emergency Management webpage, a possible brochure, available social media platforms, and local newsletters. Work with residents to ensure they comply with the Town's floodplain ordinance. **(F23) (Tables 6.1 & 7.1)**	Inland Flooding	Administrative Assistant & Select Board	Local	Life of the Plan	Very Low Cost
A-10	***Problem Statement:*** *Although the Town does a great job using its Emergency Management webpage to promote preparedness, residents may not be aware of the steps they can take to reduce the fire risk at their homes.* **Action Item #10:** Post important information on a Town's Emergency Management webpage and notices of red flag burning days. Obtain and have available Firewise® brochures to educate homeowners on methods to reduce fire risk around their homes **(WF10)** and provide a link to Firewise® on the Emergency page if established. Provide Firewise® brochures to those residents seeking burn permits (if not obtained online). Advise residents on the importance of maintaining defensible space and removing dead or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches, and yards. **(WF12) (Table 7.1)**	Wildfire	Administrative Assistant & Fire Department	Local	Life of the Plan	Very Low Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
A-11	***Problem Statement:*** *Although public outreach has been done to advise the citizens of Sugar Hill of the possibility of using the Crapo Building as a cooling shelter in times of extended high temperatures and as a warming center in times of extended cold temperatures, additional public outreach needs to be done.* **Action Item #11:** Provide public outreach to the citizens of Sugar Hill regarding the availability of the Crapo Building as a "cooling or warming center" during extended high temperatures and severe winter weather. **(ET3 & WW6)**	Extreme Temperatures & Severe Winter Weather	Administrative Assistant & Department Heads	Local	Life of the Plan	Very Low Cost
A-12	***Problem Statement:*** *Residents may not be aware of the importance of maintaining their private roads to allow emergency responders access and prevent wildfires.* **Action Item #12:** To promote private mitigation efforts, provide public outreach to the citizens of Sugar Hill on the importance of maintaining private roads to allow for safe access for fire apparatus into wildland-urban interface neighborhoods and properties. This maintenance will help ensure accessibility for emergency response and decrease the wildfire risk. **(MU16)**	Wildfire	Administrative Assistant, Fire Department & Highway Department	Local	Life of the Plan	Very Low Cost
B-1	***Problem Statement:*** *The Sugar Hill Highway Department has established a short and long-term bridge maintenance and replacement schedule. The Street Pond Bridge is one of two red-listed bridges in the Community.* **Action Item #13:** Improve the "red-listed" Streeter Pond Bridge as soon as state funding becomes available. The new bridge should be wider, longer, and angled to increase stormwater flow. This bridge is planned to be upgraded in 2023-24. **(MU13) (Tables 6.1 & 7.1)**	Inland Flooding	Highway Department, Town Engineer, Miche & Presby	Local & Grants from the 2017 Disaster	Short Term	High Cost
B-2	***Problem Statement:*** *All three emergency departments in Sugar Hill (Police/Fire/Highway Departments) have radio interoperability. Communications systems and radios are updated with state and federal requirements and work as intended. However, some areas of the Town have "dead spots".* **Action Item #14:** Obtain a better antenna for the Town Hall and add repeaters, at least in all Police Department vehicles. **(Emergency Preparedness) (Table 6.1)**	All Hazards	Emergency Management Director	Local & Grants	Short Term	Medium Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-3	***Problem Statement:*** *This Plan, the Sugar Hill Hazard Mitigation Plan Update, 2024, will need to be approved again as a Community Wildfire Protection Plan (CWPP).* **Action Item #15:** Obtain approval of this Plan as a Community Wildfire Protection Plan (CWPP) to enable potential assistance from the State and Federal governments for future wildfire mitigation projects. **(WF2)**	Wildfire	Mapping & Planning Solutions	Local	Short Term	Very Low Cost
B-4	***Problem Statement:*** *This Plan, the Sugar Hill Hazard Mitigation Plan Update 2024, will require an annual review and a complete update in five years.* **Action Item #16:** Provide an annual review of the Sugar Hill 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 update of the Plan in five years. **(MU11) (Table 6.1)**	All Hazards	Emergency Management Director	Local & Grants	Short Term & Long Term	Very Low Cost
B-5	***Problem Statement:*** *All but five of the numerous culverts listed in the prior hazard mitigation plan damaged in 2017 have been improved - the Crane Hill Road Culvert is one of the five that still needs improvements*. **Action Item #17:** Improve stormwater flow and prevent inland flooding by raising Crane Hill Road 3-4 feet and improving ditching to prevent ice buildup and river overflow. **(F13) (Table 7.1)**	Inland Flooding & Aging Infrastructure	Highway Department & Town Engineer	Local	Short Term	Low Cost
B-6	***Problem Statement:*** All but five of the numerous culverts listed in the prior hazard mitigation plan damaged in 2017 have been improved - the Creamery Pond Road Culvert is one of the five that still needs improvements. **Action Item #18:** Improve the flow of stormwater and prevent inland flooding by upgrading the culvert on Creamery Pond Road from a 36" squash (a culvert that looks like an egg) to a 60" squash and clean out the stream bed at both ends of the pipe. **(F13) (Table 7.1)**	Inland Flooding & Aging Infrastructure	Highway Department	Local & Grants	Short Term	Low Cost
B-7	***Problem Statement:*** All but five of the numerous culverts listed in the prior hazard mitigation plan damaged in 2017 have been improved - the Easton Road Culvert is one of the five that still needs improvements. **Action Item #19:** Improve the stormwater flow and prevent inland flooding by upgrading the culvert on Easton Road with an additional 4' pipe to be installed next to the one currently there. Improve the culverts to a 60" x 7' squash. **(F13) (Table 7.1)**	Inland Flooding & Aging Infrastructure	Highway Department	Local & Grants	Short Term	Low Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
B-8	***Problem Statement:*** All but five of the numerous culverts listed in the prior hazard mitigation plan damaged in 2017 have been improved - the Hadley Road Culvert is one of the five that still needs improvements. **Action Item #20:** Improve stormwater flow and prevent inland flooding by upgrading the undersized and damaged Hadley Road culvert from a 60" metal culvert to a 7' squash. **(F13) (Table 7.1)**	Inland Flooding & Aging Infrastructure	Highway Department	Local & Grants	Short Term	Low Cost
B-9	***Problem Statement:*** *There is no fire danger sign in Sugar Hill.* **Action Item #21:** Purchase and install a Fire Danger sign at the Fire Station. **(WF11) (Table 6.1)**	Wildfire	Fire Department	Local	Short Term	Low Cost
C-1	***Problem Statement:*** *Although the Sugar Hill Highway Department works to clean and repair drainage basins and culverts, a written stormwater maintenance plan should be developed to ensure continuity of actions and efficient stormwater management.* **Action Item #22:** 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)**	Inland Flooding	Highway Department	Local	Medium Term	Very Low Cost
C-2	***Problem Statement:*** *The Sugar Hill Subdivision, Zoning, and Site Plan Regulations have been recently updated and are in good shape. However, they should be reviewed when this Plan is completed to integrate action items and mitigation ideas into future planning.* **Action Item #23:** Review the Sugar Hill Subdivision, Zoning, and Site Plan Regulations to consider changes that will enhance mitigation efforts across the Community. Update these planning mechanisms and integrate elements from this Plan where possible. Assess the impact of Climate Change in areas of known hazards and determine if regulatory changes can mitigate future issues. Consider adding criteria-based regulation requiring availability for fire suppression in new subdivisions. **(WF2, F1 & MU6) (Tables 6.1 & 7.1)**	All Hazards	Planning Board & Select Board	Local	Medium Term	Very Low Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
C-3	***Problem Statement:*** *The Sugar Hill Master Plan is currently being updated. It should integrate a natural hazards section, a discussion on climate change, and action items from this Plan as appropriate.* **Action Item #24:** Review this Plan, the Sugar Hill Hazard Mitigation Plan Update 2024, when reviewing and updating the Master Plan. Consider incorporating a discussion on climate change, a natural hazards section, and mitigation action items from this Plan. **(MU6) (Table 6.1)**	All Hazards	Planning Board	Local & Grants	Medium Term	Medium Cost
C-4	***Problem Statement:*** *The Sugar Hill Highway Department has established a short and long-term bridge maintenance and replacement schedule. The Crane Hill Road Bridge is one of two red-listed bridges in the Community. The bridge is too narrow, low, and aging.* **Action Item #25:** Improve the "red-listed" Crane Hill Road Bridge as soon as state funding becomes available. The bridge should be raised, widened, and repaired. **(MU13) (Tables 6.1 & 7.1)**	Aging Infrastructure	Highway Department & Town Engineer	100% FEMA (Infrastructure Grant) & Engineering 80/20	Medium Term	High Cost
C-5	***Problem Statement:*** *Local road standards have been established to provide specifications for building new roads to ensure that the Town does not assume ownership of substandard roads. Changes in the regulations regarding paving in new subdivisions may need revision.* **Action Item #26:** Consider changes in the subdivision regulations that would mandate more stringent paving requirements for new subdivisions, perhaps mandating that the entire new subdivisions be paved to reduce the impact of road flooding and road washouts. **(F1 & F6) (Table 6.1)**	All Hazards	Planning Board	Local	Medium Term	Very Low Cost
C-6	***Problem Statement:*** *Although Sugar Hill has emergency backup power at most of the Town's Critical Infrastructure & Key Resources (CIKR), one CIKR does not have backup emergency power, the Meeting House, a designated Secondary Shelter.* **Action Item #27:** Obtain funding and install a permanent generator at the Sugar Hill Meeting House, a designated Secondary Shelter, to ensure the continuation of government during a disaster. **(Emergency Preparedness) (Table 6.1)**	All Hazards & Long Term Utility Outage	Emergency Management Director	Local & Grants	Medium Term	Low Cost

Final R/P	Problem Statement New Mitigation Action Item	Type of Hazard	Managing Department	Funding or Support	Time Frame	Est. Cost
D-1	***Problem Statement:*** *The Sugar Hill Emergency Operations Plan (EOP) was last updated in 2020 and will need to be updated again in 2025.* **Action Item #28:** Update the Sugar Hill Emergency Operations Plan to coincide with the new state 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 should include an EOC Call Alert List, a detailed Resource Inventory List, and Player Packets. **(MU6) (Tables 6.1 & 7.1)**	All Hazards	Emergency Management Director	Local & Grants	Long Term	Low Cost
D-2	***Problem Statement:*** *Dredging of the Gale River to prevent Streeter Pond Bridge scouring was completed, but the issue of enlarged gravel bars causing ice jams has returned.* **Action Item #29:** Find a solution for the scouring problem at the Crane Hill Bridge over the Gale River to help eliminate the potential for ice jam flooding on Streeter Pond Road. **(F5, F13 & F19) (Table 7.1)**	Inland Flooding	Highway Department & Town Engineer	Local & Grants	Long Term (37-60 months)	High Cost ($100,000 or more)

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

A. HAZARD MITIGATION PLAN MONITORING, EVALUATION, AND UPDATES

The Town's Emergency Management Director will call meetings of all responsible town parties to review plan progress annually on the anniversary of plan adoption and, as needed, based on the occurrence of hazard events and report outcomes to the Select Board. The public will be notified of these meetings by posting the agenda at the Town Hall. Responsible parties identified for mitigation actions will be asked to submit their reports before the meeting. Meetings will entail the following actions:

- Review previous hazard events to discuss and evaluate major issues, the effectiveness of current mitigation, and possible mitigation for future events.
- Assess how the mitigation strategies of the Plan can be integrated with other Town plans and operational procedures.
- Review and evaluate progress toward implementing the current mitigation plan based on reports from responsible parties.
- Amend the current Plan to improve mitigation practices.
- Evaluate and assess the Plan's effectiveness in achieving its goals, stated purpose, and priorities.

The following questions will serve as the criteria that are used to evaluate and update the Plan:

Plan Mission and Goal

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the goal and mission?

Hazard Identification and Risk Assessment

- Have there been any new occurrences of hazard events since the Plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.
- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall risk and vulnerability assessment should be edited to reflect these changes.
- Is there any new data available from local, state, or federal sources about the impact of previous hazard events, or any new data for the probability of future occurrences? If so, this information should be incorporated into the Plan.

Existing Mitigation Strategies

- Are the current strategies effectively mitigating the effect of any recent hazard events?
- Has there been any damage to property since the Plan was last reviewed?
- How could the existing mitigation strategies be improved to reduce the impact of recent occurrences of hazards?

Proposed Mitigation Strategies

- What progress has been accomplished for the previously identified proposed mitigation strategies?
- How have any completed mitigation strategies reduced the Town's vulnerability and impact from hazards since the strategy was completed? If not, and if they have been tested, what changes are needed to make them more effective?
- Should the criteria for prioritizing the proposed strategies be altered in any way?
- Should the priority given to individual mitigation strategies be changed based on any recent changes to financial and staffing resources or recent hazard events?

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective?
- How could it be improved?
- Are there any town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them or integrated with other town planning tools and operational procedures, including the Zoning Regulations, the Subdivision Regulations, the Master Plan, and the Capital Improvement Plan?

Following these discussions, it is anticipated that the Planning Team may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments or revise the goals and objectives contained in the Plan.

Review forms for post-hazard or annual reviews are available in Chapter 11 of this Plan. The Town is encouraged to use these forms to document any changes and accomplishments after this Plan's development. Forms are available for years 1-4.

B. INTEGRATION WITH OTHER PLANS

This Plan will only enhance mitigation if balanced with all other town plans. Sugar Hill completed its last hazard mitigation plan in 2017 and has completed or partially complete many projects. Examples in Table 7.1 include providing ongoing fire and flood education, updating the EOP, and improving many culverts that were damaged due to the July 2017 storm. As a result, the Town was able to integrate these actions into other town activities, budgets, plans, and mechanisms.

The Town of Sugar Hill has agreed to incorporate a Community Wildfire Protection Plan (CWPP) into this planning document, the Sugar Hill 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:

SUGAR HILL MASTER PLAN

Traditionally, Master Plans are updated every 5 to 10 years. A complete update of Sugar Hill's Master Plan was being done as this Plan was established. Future reviews and updates of the Master Plan will consider integrating concepts, ideas, and action items from this Hazard Mitigation Plan **(Action Item #24).**

SUGAR HILL EMERGENCY OPERATIONS PLAN 2020 (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 Sugar Hill EOP was completed in 2020. An update for the Emergency Operations Plan is expected to be completed after completing this Plan in 2025. The new EOP will incorporate elements from this hazard mitigation plan **(Action Items #28).**

TOWN BUDGET, CAPITAL IMPROVEMENT PLAN & CAPITAL RESERVE FUNDS

The Town of Sugar Hill maintains a Capital Improvement Plan (CIP) and Capital Reserve Funds (CRFs) for major expenditures. The CRFs and the CIP 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. 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 SUGAR HILL 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 Item #23).**

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

The Emergency Management Director will update the Plan every five years and incorporate the results of the Town's plan monitoring and evaluation procedures. The next anticipated annual update will begin upon the anniversary of the Plan's approval. The next full update of the Plan is scheduled to begin before the fifth anniversary of approval. Plan updates may begin earlier following a significant natural hazard event within the Town and region, such as a federally declared disaster.

The public meetings of the Planning Team shall be publicized through legal notices in local newspapers, posted fliers, and on the town website. Written and email comments shall be directed to the EMD. The updated Plan will incorporate input from the public, other municipalities, and government agencies. The Select Board is responsible for approving the Plan submission to FEMA and for adopting the Plan. The update will follow a similar planning process and outline as the current planning process, making deviations when needed. The update will be expanded to better address natural hazards, development, climate change, vulnerable populations, regional impacts, and other pertinent issues.

This Plan was completed in a series of open meetings beginning April 17, 2023. 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

SUGAR HILL HAZARD MITIGATION PLAN UPDATE

PARTIES TO THE AGREEMENT

Mapping and Planning Solutions
Town of Sugar Hill, NH

Current Plan Expiration: 7/31/2022
BRIC2020 Grant Expiration: 12/22/2024

This agreement between the Town of Sugar Hill (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 services to produce the Sugar Hill Hazard Mitigation Plan Update (the plan).

Agreement

This agreement outlines the responsibilities that will ensure plan development with the involvement of 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 accurately reflect the town's values and individuality; 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 & Emergency Management (HSEM) on behalf of the Federal Emergency Management Agency (FEMA). When adopted, the plan guides the town, commissions, and departments; adopted plans do not include any financial commitments by the town. All adopted plans should address mitigation strategies for reducing the risk of natural, technological, human-caused, and wildfire disasters on life and property and be written to integrate them into other town planning initiatives.

Scope of Work

MAPS - Responsibilities include, but are not limited to, the following:

- MAPS will collect the necessary data 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 two-hour virtual meetings to complete the project; generally, meetings are held monthly and do not exceed eight. These meetings will be held online unless unanticipated circumstances prevail. MAPS will provide any materials, handouts, and maps necessary to fully understand each step in the planning process.[32]

[32] *If unanticipated circumstances prevail and meetings are held in person, MAPS will make every effort to proceed. However, the town shall ensure that attendance at any meeting is adequate to proceed. Mapping and Planning Solutions reserves the right to invoice the town for travel, meal expenses and staff costs incurred when meeting attendance is inadequate.*

- MAPS will assist the team in developing goals, objectives, and action items and 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.

- MAPS will explain and delineate the town's Wildland Urban Interface (WUI) and, working with the team, will establish a list of potentially hazardous areas 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 Sugar Hill Select Board and continue to work with the town until final approval and distribution of the plan are complete.

- MAPS shall provide all supplies and space necessary to complete the Sugar Hill Hazard Mitigation Plan at its office.

- Once final documents are received, MAPS will print and distribute the plan. The final documents include the HSEM formal approval email, the FEMA formal letter of approval, and the approved Community Wildfire Protection Plan (CWPP) documents. MAPS will provide the town with one hard copy of the plan containing all signed documents and approvals and a flash drive containing these same documents in digital form. Additional flash drives may be requested at an 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 Sugar Hill.

- As long as MAPS is in operation, MAPS will provide annual plan maintenance reminders leading up to the next five-year plan update.

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

- The town shall ensure that the planning team includes members 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 developing mailing lists when necessary, distributing handouts, and placing 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 HSEM 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 completing the determined Action Items.*
  - *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 $6,999.75; 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).....$3,300.00
  - 3. Final payment upon project completion and receipt of the final hard copy of the plan.....$199.75

  Total Fees.....$6,999.75

- **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 BRIC2020 is $9,333, with a federal share of $6,999.75 and a matching amount of $2333.25 (75%/25% split). Matching funds are the responsibility of the Town of Sugar Hill, 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 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 to use in its match fulfillment.

- **Project Period:** This project shall begin upon grant approval from HSEM and the signing of this agreement with MAPS. The project will continue through a date yet to be determined or whenever the planning process is complete. The project period may be extended if required by mutual written agreement between the town, MAPS, and Homeland Security. The actual project end date depends on timely adoptions and approvals, which may be outside the control of MAPS and the town.

  The grant provided for this project is funded through BRIC2020. Per the grant agreement between the town and HSEM, all work must be completed by 12/22/24, the end of the Period of Performance.

- **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 that 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 completed work.

- **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 Sugar Hill. MAPS and its employees, if any, shall not be liable for opinions rendered, advice, or errors resulting from the quality of data 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 the Town of Sugar Hill and Mapping and Planning Solutions.

- **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 and more than 80 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
PO Box 283, 91 Cherry Mountain Place
Twin Mountain, NH 03595
jgarneau@mappingandplanning.com
(603) 991-9664 (cell)

For the Town of Sugar Hill

Mike Ho Sing Loy, Police Chief & EMD
Town of Sugar Hill
PO Box 574, 1411 Route 117
Sugar Hill, NH 03586
(603) 823-8123 (police department)
policechief@sugarhillnh.org

The signatures below indicate acceptance of and agreement to the details outlined in this agreement.

FOR THE TOWN OF SUGAR HILL, NH

Signature

Michael Ho-Sing-Loy

4/23/2023

Date

FOR MAPPING AND PLANNING SOLUTIONS

Signature
June Garneau, Owner
April 22, 2023

Signatures are scanned facsimiles; original signatures are on file.

B. APPROVED PENDING ADOPTION (APA) FROM FEMA

HMP Approvable Pending Adoption (APA) Notice: Sugar ...

NJ

Neiderbach, Josiah <josiah.n

To policechief@sugarhillnh.org

Cc Surette, Melissa; FEMA-R1-MitigationPlans; Doyle, Lynne; DOS: Hazard Mitigation; **+2 others**

Tue 4:44 PM

You replied to this message on 4/10/2024 9:01 AM.
This message was sent with High importance.

Sugar Hill NH APA Review.docx 95 KB

Reference: Adoption Required to Finish Local Mitigation Plan Process

Dear Officials:

The FEMA Region 1 Mitigation Division has determined the *Sugar Hill, NH 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 Sugar Hill, 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 facsimiles; original signatures are on file.

C. FORMAL APPROVAL LETTER FEMA

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INSERTION OF FINAL APPROVAL LETTER FROM
FEMA

Signatures are scanned facsimiles; original signatures are on file.

D SIGNED CERTIFICATE OF ADOPTION

CERTIFICATE OF ADOPTION

SUGAR HILL, NH

SELECT BOARD

A RESOLUTION ADOPTING THE SUGAR HILL, NH HAZARD MITIGATION PLAN UPDATE 2024

WHEREAS, the Town of Sugar Hill 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 Sugar Hill has received Approved Pending Adoption (APA) status from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2024 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between April 17, 2023 and August 14, 2023, regarding the development and review of the Hazard Mitigation Plan Update 2024 and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Sugar Hill 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 Sugar Hill 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 Sugar Hill;
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;

Sugar Hill, 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 on the progress of the Plan's action items to the Select Board.

Adopted this day, the _____ of _____, 2024

Select Board Chair

_____
Signature

_____
Print Name

Member of the Select Board

_____
Signature

_____
Print Name

Member of the Select Board

_____
Signature

_____
Print Name

Member of the Select Board

_____
Signature

_____
Print Name

Emergency Management Director

_____
Signature

_____
Print Name

IN WITNESS WHEREOF, the undersigned has affixed their signature and the corporate seal of the Town of Sugar Hill on this day, _____, 2024

_____
Notary

_____
Expiration

_____
Date

Signatures are scanned facsimiles; original signatures are on file.

E. CWPP APPROVAL LETTER FROM DNCR

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

Several public meetings and committee meetings were held between April 17, 2023 and August 14, 2023, regarding the development and review of the Sugar Hill Hazard Mitigation Plan Update 2024. The Sugar Hill Hazard Mitigation Plan Update 2024 contains potential future projects to mitigate hazard and wildfire damage in the Town of Sugar Hill.

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

The Select Board, the Emergency Management Director, and the Fire Chief approve the Sugar Hill 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 Sugar Hill

APPROVED and SIGNED this day, _____, 2024.

_____ _____
Chairman of the Select Board Printed Name

_____ _____
Emergency Management Director Printed Name

_____ _____
Fire Chief 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 facsimiles; 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.

Sugar Hill, 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

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Please use the reverse side for additional notes ➡

Additional Notes – Year One:

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.

Sugar Hill, 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

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Please use the reverse side for additional notes 

Additional Notes – Year Two:

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.

Sugar Hill, 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

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Please use the reverse side for additional notes 

Additional Notes – Year Three:

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.

Sugar Hill, 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

_____

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Please use the reverse side for additional notes 

Additional Notes – Year Four:

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 Policy Guide**, FEMA, April 19, 2023
- **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**
    - Sugar Hill Hazard Mitigation Plan, 2017
    - Enfield Hazard Mitigation Plan, 2022
    - Hanover Hazard Mitigation Plan, 2023
    - Greenland Hazard Mitigation Plan, 2023
- **NH State Multi-Hazard Mitigation Plan**, 2023
    - *https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2023/10/2023-NH-State-Hazard-Mitigation-Plan-Signed-10.5.23.pdf*
- **Disaster Mitigation Act (DMA) of 2000,** Section 101, b1 & b2 and Section 322a
    - *https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/regulations-guidance#:~:text=The%20Disaster%20Mitigation%20Act%20of,of%20non%2Demergency%20disaster%20assistance*
- **Economic & Labor Market Information Bureau**, NH Employment Security, October 2023; Community Response for Sugar Hill, Received, 7/12/2023, Census 2000 and Revenue Information derived from this site;
    - *http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Sugar Hill.htm*

Photos

- Photos are taken by MAPS unless otherwise noted.

Map Images

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

Wildfire Links

- US Forest Service; *https://www.fs.usda.gov/*
- US Fire Administration; *https://www.usfa.fema.gov/*
- Community Wildfire Defense Grant Program: *https://www.fs.usda.gov/managing-land/fire/grants#:~:text=The%20Community%20Wildfire%20Defense%20Program,reduce%20the%20risk%20of%20wildfire*
- Firewise®; *https://www.nfpa.org/Education-and-Research/Wildfire/Firewise-USA*
- Fire Adapted Communities; *https://www.fireadapted.org*
- Ready Set Go; *http://www.wildlandfires.org/*
- Fire education for children; *https://www.smokeybear.com/*

Additional Websites

- NH Homeland Security & Emergency Management; *https://www.nh.gov/safety/divisions/hsem/*
- US Geological Survey; *https://www.usgs.gov/mission-areas/water-resources/science/land-subsidence*
- Department Environmental Services; https://www.des.nh.gov/
- The Disaster Center (NH); *https://www.disastercenter.com/newhamp/tornado.html*
- The NFIP; *https://www.floodsmart.gov/*
- NOAA, National Weather Service; *https://w1.weather.gov/glossary/*
- NOAA, Storm Prediction Center; *https://www.spc.noaa.gov/faq/tornado/beaufort.html*
- National Weather Service; *https://www.weather.gov/safety/cold*
- Center for Disease Control; *https://www.cdc.gov/disasters/winter/index.html*
- Slate; *https://slate.com/news-and-politics/2003/12/outbreaks-vs-epidemics.html*
- NH Bureau of Economic Affairs; *https://www.nheconomy.com/office-of-planning-and-development*
- Code of Federal Regulations; Title 14, Aeronautics and Space; Part 1, Definitions and Abbreviations; *https://www.ecfr.gov/current/title-14/chapter-I/subchapter-A/part-1*
- US Legal, Inc.; *https://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 suffering[33]:

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.

[33] 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 submitting 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. [34]

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.

[34] 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

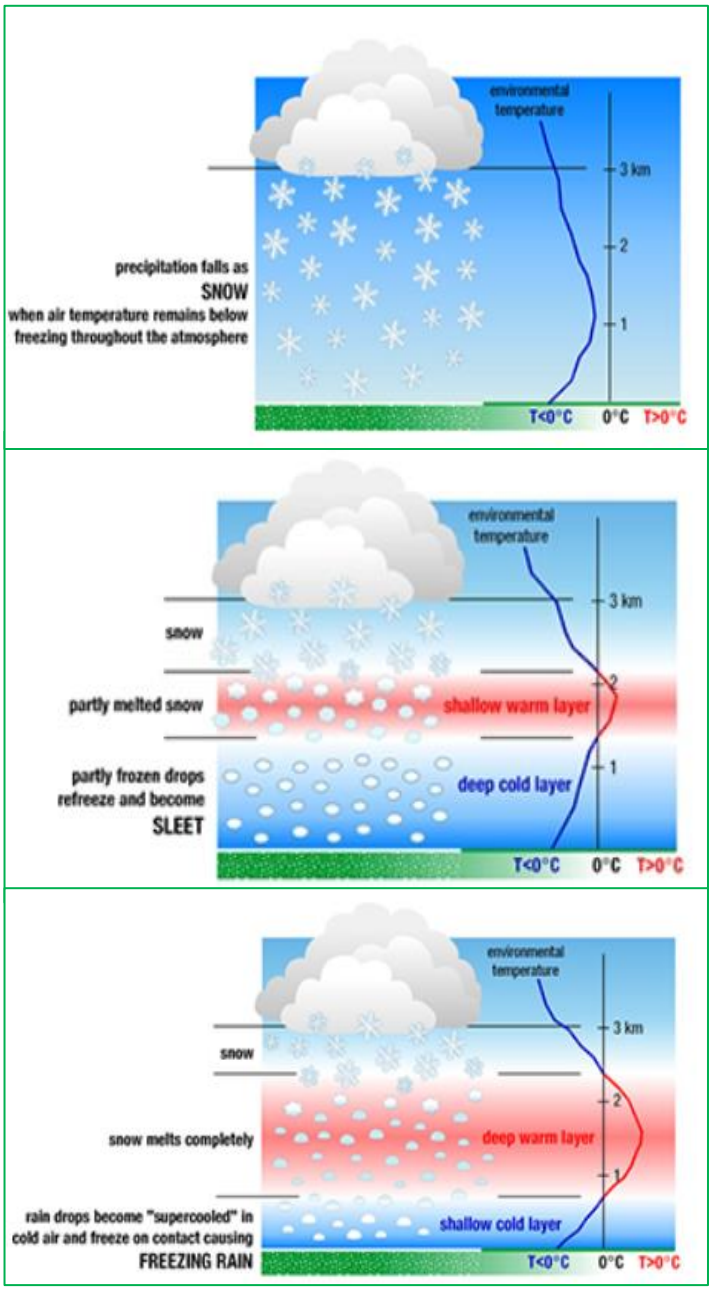
A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow for 12 hours or six inches for 24 hours.

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.”[35]



Types of Severe Winter Weather
NOAA – National Severe Storms Laboratory

[35] NOAA, National Severe Storms Laboratory, https://www.nssl.noaa.gov/education/svrwx101/winter/types/

The Sperry-Piltz Ice Accumulation Index (SPIA) (below) is designed to help utility companies better prepare for predicated ice storms.[36]

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

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	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	

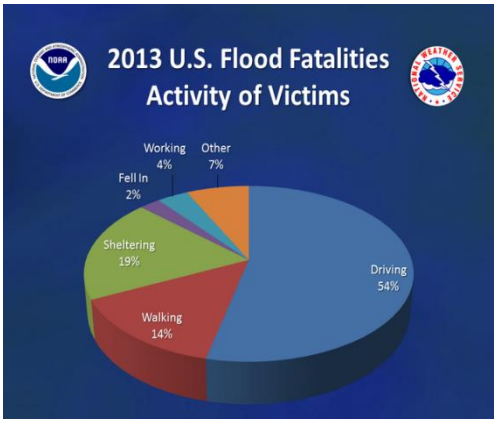
(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

*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.



[36] The Weather Channel, https://weather.com/news/weather-winter/rating-ice-storms-damage-sperry-piltz-20131202

Flooding (Dam Failure)

Flooding due to 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 pond[37]. 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 manner[38]:

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

[37] https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/vol2-appC.pdf
[38] https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/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.

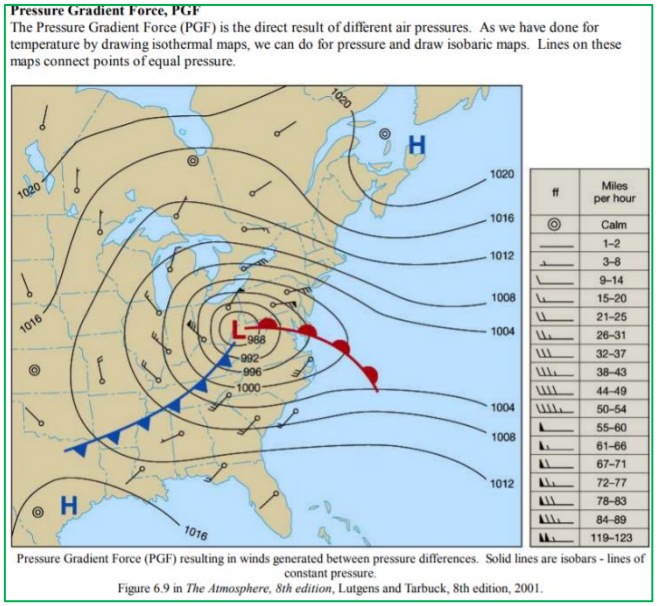
Erosion

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 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.[39]

*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.[40] [41]



[39] https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf
[40] NOAA; https://w1.weather.gov/glossary/index.php?letter=w
[41] 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 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."[42] 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 are severely stripped; mobile homes are overturned or badly damaged; loss of exterior doors; windows and other glass is 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.

[42] Enhance Fujita Scale, https://www.wunderground.com/prepare/hurricane-typhoon

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.[43]

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.[44]

Force	Wind (Knots)	WMO Classification	The appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction; still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes bring to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted; small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against the wind
8	34-40	Gale	Moderately high (13-20 ft.) waves of greater length, edges of crests begin to break into spindrift, forum 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, and 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	

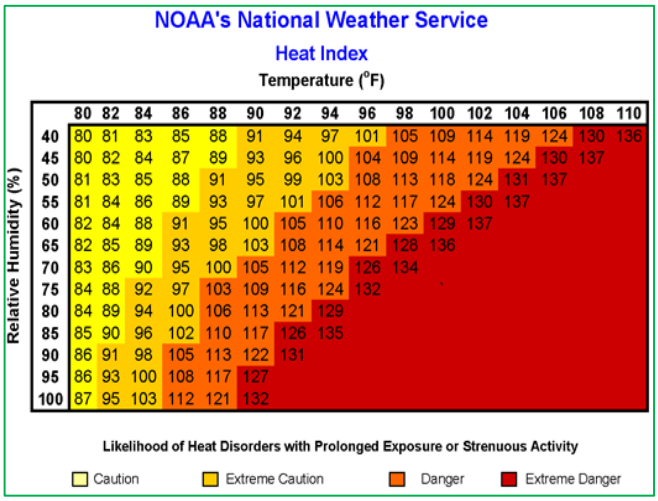
[43] NOAA - https://www.noaa.gov/jetstream/wind_damage
[44] NOAA, Storm Prediction Center, https://www.spc.noaa.gov/faq/tornado/beaufort.html

*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.

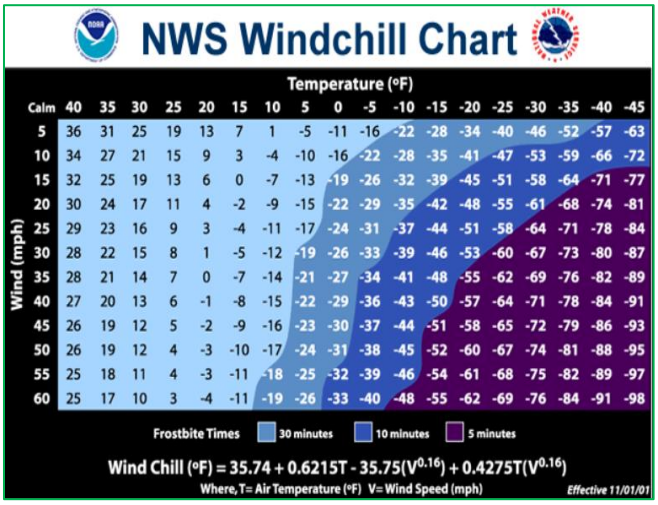


RH (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

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. The chart above explains the likelihood of heat disorders that may result from high heat.[45]

Extreme Cold

What constitutes extreme cold and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near-freezing temperatures are considered "extreme cold." Whenever temperatures drop decidedly below average and wind speed increases, heat can leave your body more rapidly; these weather-related conditions may lead to serious health problems. Extreme cold is dangerous; it can bring on health emergencies in susceptible people without shelter, those stranded, or those living in poorly insulated homes or without heat. The National Weather Service Chart (to the right) shows windchill due to wind and temperature.[46]



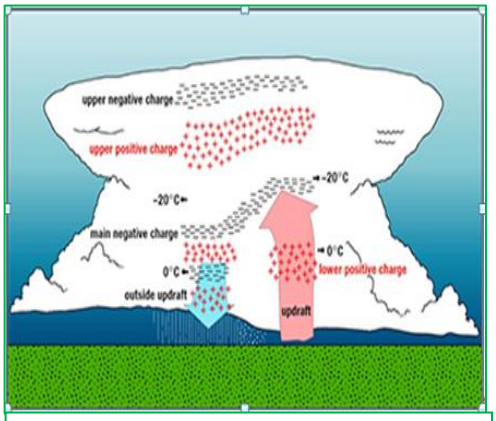
Wind (mph)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

[45] NOAA; https://www.weather.gov/safety/heat-index
[46] National Weather Service; https://www.weather.gov/safety/cold-wind-chill-chart

*LIGHTNING

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."[47]



"A conceptual model shows the electrical charge distribution inside deep convention (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

Thunder, a result of lightning, is created when the "lightning channel heats the air to around 18,000 degrees Fahrenheit..."[48] 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.

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."[49]

[47] NOAA National Severe Storms Laboratory, https://www.nssl.noaa.gov/education/svrwx101/lightning
[48] Ibid
[49] Ibid

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.	

https://graphical.weather.gov/definitions/defineLAL.html

*WILDFIRE

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*."[50]

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.

[50]https://codes.iccsafe.org/content/IWUIC2021P1/chapter-2-definitions#:~:text=WILDFIRE.,exposing%20and%20possibly%20consuming%20structures

*TROPICAL/POST TROPICAL CYCLONES

Cyclones (Hurricanes)

A hurricane is a tropical cyclone with 74 miles per hour or more winds that 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 page[51]) 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."[52]

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.
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.[53]

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.

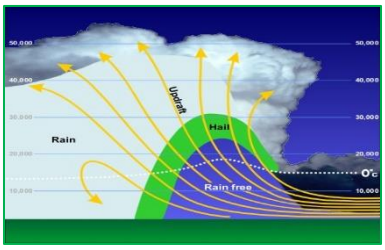
[51] National Hurricane Center; https://www.nhc.noaa.gov/aboutsshws.php
[52] Ibid
[53] https://www.wpc.ncep.noaa.gov/research/mcs_web_test_test_files/Page1637.htm

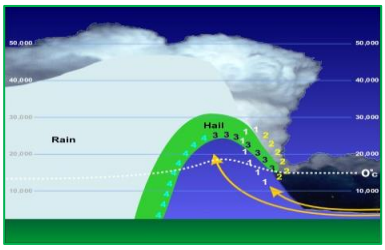
Hail

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 includes. It weighed 1 lb. 15 oz."[54]

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.[55] The charts to the right show how hail is formed.[56]





*EARTHQUAKE

An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric, and phone lines, and often cause landslides, flash floods, fires, and avalanches. 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.

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
		7.5
		8

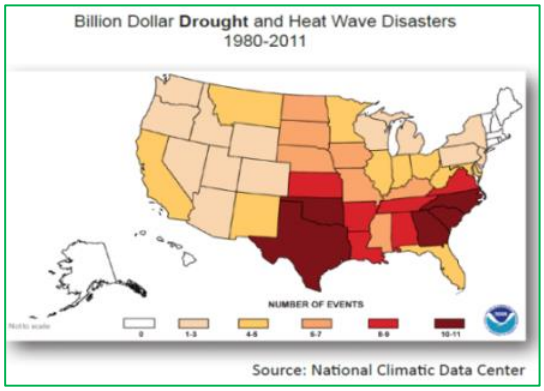
Using the commonly used scales, the Richter scale (which measures strength or magnitude) and the Mercalli Scale (which measures intensity or severity), the magnitude and intensity of an earthquake are determined. The chart to the right shows the two scales relative to one another. The Richter scale measures earthquakes starting at one as the lowest, with each successive unit being about ten times stronger and more severe than the previous one.[57]

It is well documented that fault lines run throughout New Hampshire, but high-magnitude earthquakes have not been common in NH history. 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.

[54] NOAA National Severe Storms Laboratory; https://www.nssl.noaa.gov/education/svrwx101/hail/
[55] https://www.pinterest.com/pin/126171227030590678/
[56] https://www.noaa.gov/jetstream/hail
[57] https://dnr.mo.gov/land-geology/hazards/earthquakes/science/relationship-between-richter-magnitude-modified-mercalli-intensity

*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 not 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 to the right, 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 start was in Category D3 or Extreme Drought.

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

https://www.nrcc.cornell.edu/services/blog/2018/06/28/index.html; photo from US Drought Montor

LANDSLIDES

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.[58]

*INFECTIOUS DISEASE

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.[59]

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.[60]

"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."[61]

[58] State of New Hampshire Multi-Hazard Mitigation Plan Update 2023 & https://oas.org/dsd/publications/Unit/oea66e/ch10.htm
[59] https://www.mayoclinic.org/diseases-conditions/infectious-diseases/symptoms-causes/syc-20351173
[60] https://www.dhhs.nh.gov/programs-services/disease-prevention/infectious-disease-control
[61] https://www.webmd.com/a-to-z-guides/bacterial-and-viral-infections#1

In early 2020, a novel coronavirus emerged in China, spreading worldwide to become the worst pandemic since the 1918 Spanish Flu. Known as COVID-19, this novel coronavirus had infected 676,609,955 people and caused the deaths of 6,881,955 individuals worldwide as of March 20, 2023, the final day that Johns Hopkins collected COVID-19 data, after three years. The Delta and Omnicron variants appeared in the US in December 2021, causing critical concerns about the possibility of overwhelming the country's hospital systems.

The pandemic remains an evolving worldwide crisis, affecting millions of workers in the United States and presenting significant economic results. Although most people confirmed with COVID-19 eventually recover, and many have been vaccinated, the virus remains a risk for the elderly and compromised individuals.

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

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

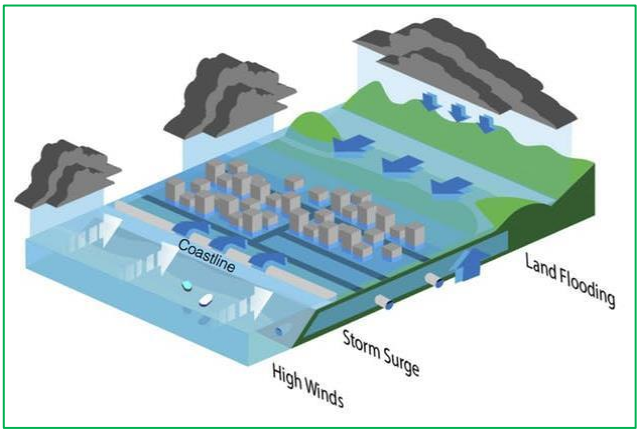
Epidemic.....Disease that shows an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area

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

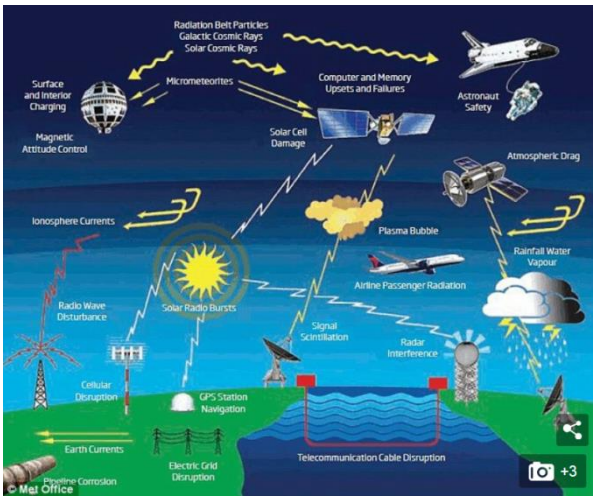
COASTAL FLOODING



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 2023 State Hazard Mitigation Plan states, "*Coastal flooding is defined by the National Oceanic and Atmospheric (NOAA) as flooding which occurs when there are significant storms, such as tropical and extratropical cyclones (NWS Internet Services Team, 2009).*"[62]

The State Plan goes on to discuss problems associated with coastal flooding, *"These problems can include but are not limited to—beach and shoreline erosion; loss or submergence of wetlands, other coastal ecosystems, and developed land; impacts from saltwater intrusion and high groundwater tables; loss of coastal structures (sea walls, piers, bulkheads, bridges, or buildings); overwhelmed public infrastructure; water quality impairments; and hazardous waste exposure. Loss of life and property damage can be more severe in coastal storm events due to velocity of wave action and accompanying winds*.[63]

SOLAR STORMS & 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 participles 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.[64]

[62] New Hampshire State Hazard Mitigation Plan, 2023 Update; https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2023/10/2023-NH-State-Hazard-Mitigation-Plan-Signed-10.5.23.pdf; page 127
[63] Ibid, page 127
[64]https://www.dailymail.co.uk/sciencetech/article-3764842/A-solar-storm-destroy-planet-unless-create-massive-magnetic-shield-protect-Earth-warns-expert.html

Solar Storms & Space Weather Extent[65]

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

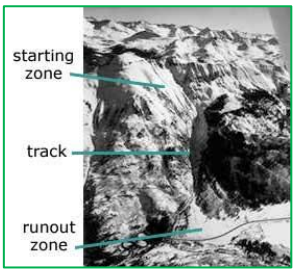
[65] Extent charts taken from https://www.weather.gov/akq/SpaceWeather

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. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	X20 (2×10^{-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 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 (5×10^{-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^{-5})	2000 per cycle (950 days per cycle)

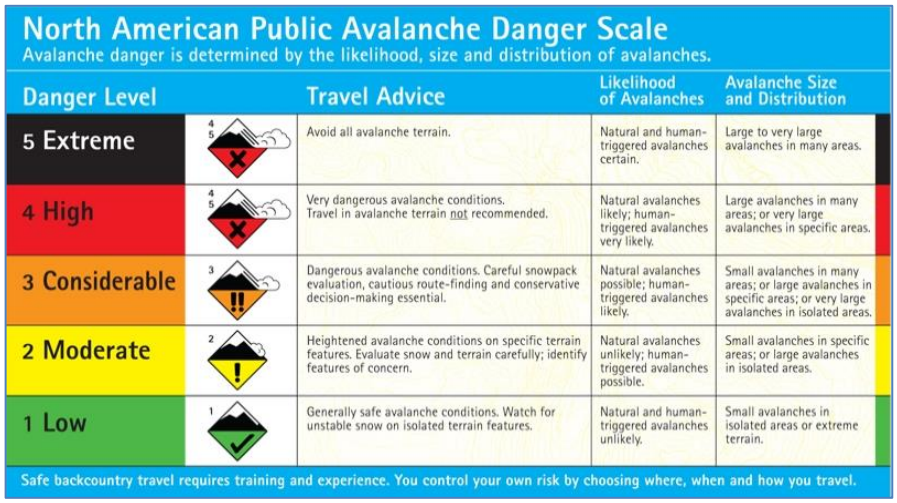
AVALANCHE

According to the National Snow & Ice Data Center, an avalanche is a rapid flow of snow down a hill or mountainside. Although avalanches can occur on any slope given the right conditions, certain times of the year and 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.[66]



[66] Copyright Richard Armstrong, NSIDC, https://nsidc.org/learn

"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 not 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."[67]

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 avalanche has stopped in the runout zone, leaving 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."[68]

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.[69]

[67] NSIDC, https://www.sierraavalanchecenter.org/introduction-north-american-avalanche-danger-scale
[68] Copyright Richard Armstrong, NSIDC, http://nsidc.org/cryosphere/snow/science/avalanches.html
[69] NSIDC, https://www.sierraavalanchecenter.org/introduction-north-american-avalanche-danger-scale

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-4740	Inland Flooding	July 9-17, 2023	Coos, Grafton, Belknap, Sullivan & Cheshire	**Major Disaster Declaration, DR-4740:** Severe storms brought significant summer rains and flooding to towns within five counties in New Hampshire.
DR-4693	Inland Flooding	December 22-25, 2022	Belknap, Grafton, Carroll & Coos	**Major Disaster Declaration, DR-4693:** A severe winter storm occurred December 22-25, 2022. Heavy, wet snow caused trees and power lines to fall; some roadways were closed. Flooding also occurred in several communities. The declaration was declared in four of the State's ten counties.
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.

Number	Hazard	Date of Event	Counties	Description
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**
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 Strafford 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.

Number	Hazard	Date of Event	Counties	Description
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.
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'easters, 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)

Number	Hazard	Date of Event	Counties	Description
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)
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:**

Number	Hazard	Date of Event	Counties	Description
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:**
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; https://www.fema.gov/disaster/declarations

APPENDIX E: HAZARD MITIGATION PLANNING – LIST OF ACRONYMS

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

APPENDIX F: POTENTIAL MITIGATION IDEAS[70]

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

Hail

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

Landslides

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

Inland Flooding

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 Colds 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 of 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

High Wind Events

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

[70] 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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Sugar Hill Meeting House
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