

# Alstead, NH Hazard Mitigation Plan Update 2023



Prepared by the:

**Town of Alstead Hazard Mitigation Work Group  
&  
Southwest Region Planning Commission**  
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FEMA Approval (add date)



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## Executive Summary

The Alstead Hazard Mitigation Plan serves as a means to reduce future losses from natural, technological, and human-caused hazard events before they occur. The Plan was developed by the Alstead Hazard Mitigation Work Group.

### **Hazards considered in the plan:**

Flooding, drought, extreme temperatures, high wind events/tornados, infectious disease, solar storms and space weather, tropical storms/hurricanes, severe winter weather, and wildfires.

### **The Hazard Mitigation Work Group identified “Critical Facilities” as follows:**

#### **Critical Facilities**

- Town Hall
- Schools
- Fire Stations
- Public Works Garage
- Fuel Storage Facilities
- Police Station

### **The Hazard Mitigation Work Group identified existing hazard mitigation programs as follows:**

- Best Management Practices
- National Flood Insurance Program
- Floodplain Development Ordinance
- School Evacuation Plan
- Emergency Backup Power Program
- Local Road Design Standards
- Dam Emergency Action Plans
- Local Roads Maintenance Program
- Local Bridge Maintenance Program
- Shoreland Protection Program
- Mutual Aid (Fire, Public Works, Police)
- Fire Pond Management Plan
- Alstead Master Plan
- Spill Prevention and Counter Measures Plan
- Ambulance Service
- Wetlands Protection
- Erosion & Sedimentation Plan
- Town Radio System
- Capital Improvements Plan
- Fire Inspector

**The Alstead Hazard Mitigation Work Group prioritized newly identified hazard mitigation strategies as follows:**

- Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.
- Update the Town website to improve public awareness of NFIP. Include preparedness and mitigation methods for residents to reduce the impact of all natural disasters.
- Culvert replacement/upgrade at Drewsville Road.
- Install concrete bridge or concrete span on Hill Road for better flow of water. (top of Bell Hill)
- Stabilize the streambank along Warren Brook near 577 Forest Road.
- Continue ditching improvement program.
- Continue to maintain the fire prevention program.
- Continue to advise homeowners on Hill Road and Cook Hill Road of potential risks of a landslide.
- Upgrade radio/communication system for Director of Public Works and emergency responders with better coverage and interoperability.
- Continue to update Capital Improvement Program and include projects from this action plan.
- River bank monitoring - regular monitoring to detect erosion.
- Review the Dam Emergency Action Plans and maintain updates.
- Update the Master Plan to include this Hazard Mitigation Plan as a chapter, appendix or by reference.
- Regular monitoring of water flow/ practice emergency procedures from the Dam Action Plan.
- Explore different methods of emergency notification (reverse 911, NOAA radios, etc.).
- Review the Floodplain Development Ordinance and update as needed.
- Install concrete bridge or concrete span on North Road for better flow of water. Pole # 8
- Install concrete bridge or concrete span on North Road for better flow of water. Pole #11
- Culvert replacement/upgrade at Cobb Hill Road. (1/2 mi. from NH 123)
- Culvert replacement/upgrade near 438 Walpole Valley Road.
- Culvert replacement/upgrade near 473 Walpole Valley Road.
- Culvert replacement/upgrade on Walpole Valley Road (near pole # 1/5 PSNH).
- Culvert replacement/upgrade at Comstock Road (at Langdon town line).
- Culvert replacement/upgrade at Hill Road. (Darby Brook farm).
- Culvert replacement/upgrade near 272 Thayer Brook Road.
- Culvert replacement/upgrade on Thayer Brook Road (between Corbin Road and the Marlow town line).
- Culvert replacement/upgrade on Thayer Brook Road near pole #79.
- Culvert replacement/upgrade at Rhodes Road.
- Culvert replacement/upgrade at various other locations as needed.
- Install a larger gate at Vilas Pool Dam that could be hydraulically operated as needed.
- Install concrete bridge or concrete span near 472 Southwoods Road for better flow of water.
- Install a generator at the school.
- Consider options to increase water resources such as cisterns and additional dry hydrant locations.
- Investigate hiring a part-time fire inspector.
- Update the Emergency Operations Plan in 2024. Prepare an application for funding in winter of 2023.
- Coordinate with State and Federal Government to address the repetitive washout of NH 123A.
- Explore the staging of emergency services to strategic locations for potential dam breaches/failures.
- Provide a link to the daily space weather report on the Town website.
- Equip the Emergency Operations Center and shelters with materials to handle a wide-spread infectious disease event.
- Consider locations for a heating, cooling and charging center.
- Dredge Vilas Pool to increase flood storage capacity.

- Install EMP surge protectors in town vehicles and equipment.
- Determine an engineering firm for the Vilas Dam spillway.
- Stabilize the streambank along Darby Brook near 179 Hill Road.

# Chapter 1

## Introduction

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### Plan Development

#### Purpose

The Alstead Hazard Mitigation Plan Update 2023 is a planning tool to be used by the Town of Alstead, as well as other local, state and federal governments, in their efforts to reduce the effects from natural and man-made hazards. By maintaining an updated Hazard Mitigation Plan, the Town is eligible to receive grant funding for mitigation projects.

#### Authority

This Multi-Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act), herein enacted by Section 104 of the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390). This Act provides new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts. The development and periodic update of this plan satisfies the planning requirements of the Disaster Mitigation Act (DMA) of 2000 which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).

#### Funding Source

This Plan was funded by the NH Homeland Security and Emergency Management, with a grant from the Federal Emergency Management Agency (FEMA) Pre-disaster Mitigation Program.

#### Scope of the Plan

The scope of this Plan includes the identification of past and potential natural and manmade hazards affecting the Town of Alstead, the determination of vulnerability of existing and future structures to the identified potential hazards, and the identification and discussion of new strategies aimed at mitigating the likely effects of potential hazards before they occur.

#### Methodology

Using the Local Hazard Mitigation Planning Handbook, the Alstead Hazard Mitigation Work Group developed the content of the Alstead Hazard Mitigation Plan by following tasks set forth in the handbook. The Work Group held monthly meetings, open to the public, in order to develop the Plan.

**Task 1: Determine the Planning Area & Resources:** This task was conducted by Town staff and Southwest Region Planning Commission. The results of this research were shared with the Work Group and can be found in Chapter 2, “Community Profile”.

**Task 2: Building the Planning Team:** The Emergency Management Director contacted Town officials, department heads, and residents who might wish to volunteer their time and serve on a Work Group.

**Task 3: Create an Outreach Program:** This task was used throughout the Plan and is a vital part of the Plan’s success. Many of the proposed actions involve a community outreach component for individuals to use as a means to reduce the risk of loss of life and property from future natural, technical and human-caused hazards.

**Task 4: Review Community Capabilities:** The Work Group brainstormed on the type of hazards and locations that have sustained or could be susceptible to each hazard within the Town. The Work Group then identified and catalogued all of the critical facilities in Alstead. The result is found in Chapter 5 with a location map at the end of the Plan.

**Task 5: Conduct a Risk Assessment:** The Work Group conducted several assessments to help determine the gaps in coverage. These include Vulnerability Assessments and Assessing Probability, Severity and Risk. In addition to the assessments, the existing mitigation strategies were reviewed to determine where gaps in coverage exist and areas that need improvement.

**Task 6: Develop a Mitigation Strategy:** The Work Group identified plans and policies that are already in place to reduce the effects of natural hazards. Then the Work Group evaluated the effectiveness of the existing measures to identify where they can be improved. The Work Group developed the Mitigation Action Plan, which is a clear strategy that outlines who is responsible for implementing each project, as well as when and how the actions will be implemented and the funding source.

**Task 7: Keep the Plan Current:** It is important to the Town of Alstead that this Plan be monitored and updated annually or after a presidentially declared disaster. Chapter 9 addresses this issue.

**Task 8: Review & Adopt the Plan:** The Work Group members reviewed and approved each section of the Plan as it was completed. After acceptance by the Work Group, the Plan was submitted to the New Hampshire Homeland Security and Emergency Management (HSEM) for review and Approval Pending Adoption. At a public meeting, the Select Board formally adopted the Plan on (add adoption date). The Plan was then granted formal approval by HSEM (add approval date by HSEM) and the formal approval letter from FEMA was received on (add date of letter).

**Task 9: Create a Safe & Resilient Community:** The Work Group discussed the mitigation actions in the Action Plan and the ways in which the implementation of the actions will be beneficial to the community. Annual reviews of the Action Plan by the Work Group are needed to maintain the timeframes identified for completion of activities. Incorporation of the Plan into other land use plans and the help to ensure that the goals of the Plan are met. Implementation of the actions prior to a hazardous event can be funded through a variety of resources found at the end of this plan in Appendix D.

A final draft of this Plan was made available to the Work Group and the public for review and comment. The document was also provided to the NHEM for their review and comment.

## Public Work Group Meetings

Work Group meetings were held at the Alstead Town Office on November 3 and December 1, 2022; January 1, February 9, and March 2, 2023.

An email was sent to each Work Group member, prior to each meeting that contained an agenda (Appendix E) and information to be covered. Agendas were posted at the Town Office to encourage public participation.

## Public Participation

An article was printed in the Southwest Region Planning Commission (SWRPC) newsletter to inform the members of the community as well as surrounding communities and other interested stakeholders about participating in this plan update. Copies of the newsletter were sent to the 34 towns within the region, the Cheshire County Office, businesses, and other interested parties. It was also available on the SWRPC website. In addition to the SWRPC newsletter and website, an email of the *SWRPC Happenings* was sent



to more than 600 addresses, including neighboring communities, counties, businesses, and academia. The email newsletter contained notices of public meetings and events.

A copy of the draft Plan was made available for public review and input at the Town Office from (add dates). In addition, the draft Plan was also available for public viewing on the Town website to reach a broad range of interested parties. A copy of the public notice for the public viewing period is in Appendix E. All comments from the public received during the drafting stage of the Plan as well as following the public viewing period were incorporated into the Plan.

## Resource List for Hazard Mitigation Team

Alstead's EMD, or designee, reviewed and coordinated with the following agencies in order to determine if any conflicts existed or if there were any potential areas for cooperation. All agencies mentioned below were contacted by Alstead's EMD, or designee. All agencies were given the opportunity to participate in the Work Group meetings or provide valuable input and guidance through telephone conversation or printed data. Training support has been offered by some of those on this resource list.

New Hampshire Homeland Security and Emergency Management: 33 Hazen Drive, Concord, NH 03305 Field Representative: Jillian Piwoski	1-800-852-3792 603-223-3626
New Hampshire Department of Transportation: John Kallfelz (District 4), Swanzey, NH 03446	603-352-2302
New Hampshire Department of Environmental Services - Dam Bureau: Nancy Baillargeon	603-271-3406
New Hampshire Office of Planning and Development: Samara Ebinger	603-271-1755

## Plan Updates

During the planning process, the Work Group reviewed relevant portions of the previous hazard mitigation plan and updated those portions accordingly. Unchanged sections were incorporated into the Plan while other sections were amended to reflect changes. Particular attention was given to the previous mitigation strategies that have been completed to give a status update on those that remain on the list. The previous plan was used as a basis to begin the update. Amendments were made in each chapter to reflect changes that have occurred during the five-year period. Included in the changes were:

- Chapter 1 - Introduction - updated Methodology, Acknowledgements, etc.;
  - Chapter 2 - Community Profile - NFIP policies updated, added updated demographics;
  - Chapter 3 - Assessing Probability, Severity, and Risk - updated risk assessment;
  - Chapter 4 - Past and Potential Hazards - updated hazards and their location;
  - Chapter 5 - Critical Facilities - updated locations;
  - Chapter 6 - Existing Mitigation Strategies and Proposed Improvements - updated chart and other data, updated chart for Status of Previous Mitigation Action Items;
  - Chapter 7 - Proposed Mitigation Strategies - updated STAPLEE chart;
  - Chapter 8 - Prioritized Implementation Schedule - updated Action Plan;
  - Chapter 9 - Adoption, Implementation, Monitoring, and Updates - Adoption certificate, updated information.
- Appendices - agendas, resources, public documentation.

This update was prepared with assistance from professional planners at SWRPC trained in hazard mitigation planning. Data and maps used to prepare this Plan are available at their office and should be used in preparing future updates.

## **Acknowledgements**

The Alstead Select Board extends special thanks to the Alstead Hazard Mitigation Work Group as follows:

Steven Reynolds, *Alstead Emergency Management Director*

Darren Perlongo, *Alstead Deputy EMD*

Werner Drouin, *Alstead Ambulance*

Penny Gendron, *Alstead Police Department*

Gordon Kemp, *Alstead Planning Board*

Kim Kercewich, *Alstead Fire Chief*

Joe Levesque, *Alstead Select Board*

Jesse Moore, *Alstead Ambulance*

Stephen Murrell, *Alstead Police Chief*

Mary Schoppmeyer, *Alstead Administrative Assistant*

Prescott Trafton, *Alstead Road Agent*

Adam Vose, *Alstead Ambulance*

The Alstead Select Board offers thanks to the New Hampshire Homeland Security and Emergency Management for developing the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 which served as a model for this plan. In addition, special thanks are extended to the staff of the Southwest Region Planning Commission for professional services, process facilitation and preparation of this document.

## **Hazard Mitigation Goals**

The Alstead Hazard Mitigation Work Group reviewed the goals set forth in the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018. The Work Group generally concurs with those goals and has amended them to better meet the goals of the Town.

### **Town of Alstead, NH**

The overall Goals of the Town of Alstead with respect to Hazard Mitigation are stipulated here:

1. To improve upon the protection of the general population, the citizens of the Town of Alstead and guests, from all natural, technological and human-caused hazards.
2. To reduce the potential impact of natural, technological and human-caused hazards on the Town of Alstead's emergency response services, critical facilities, and infrastructure.
3. To reduce the potential impact of natural, technological and human-caused disasters on the Town of Alstead's economy, natural resources, historic/cultural treasures, and private property.
4. To improve the Town of Alstead's emergency preparedness and disaster response and recovery capability.
5. To reduce the Town of Alstead's risk with respect to natural, technological and human-caused hazards through outreach and education.
6. To identify, introduce and implement cost-effective hazard mitigation measures so as to accomplish the Town's goals and objectives and to raise the awareness of and acceptance of Hazard Mitigation opportunities generally.
7. To address the challenges posed by climate change as they pertain to increasing risks in Alstead's infrastructure and natural environment.
8. To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals and with FEMA.

## Chapter 2

# Community Profile

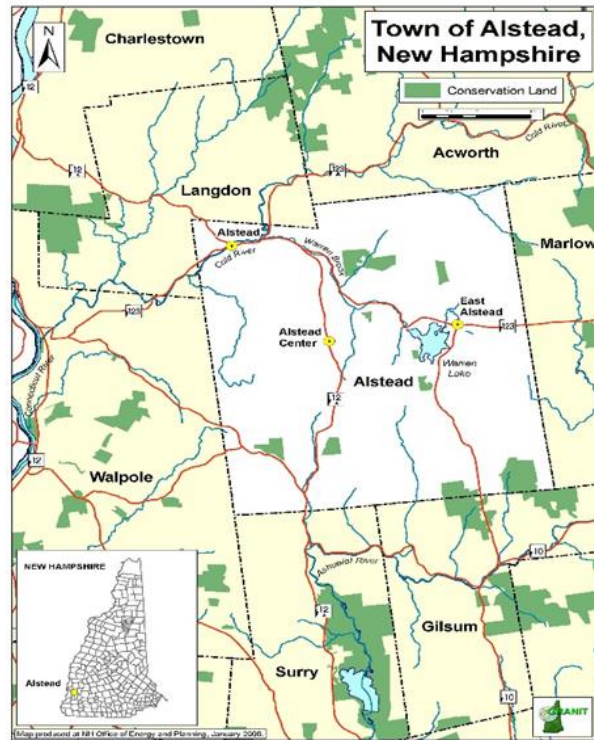
### Town Overview

The Town of Alstead is located in the western portion of Cheshire County, in Southwest New Hampshire. Alstead is bounded on the north by Langdon and Acworth, easterly by Marlow, southerly by Gilsum and Surry and westerly by Walpole.

The Cold River and Warren Brook flow through the northern part of Alstead and join together just east of the village center. Additionally, Alstead has large amounts of land that have been publicly and privately protected from development as shown on the map below. The two largest bodies of water are Lake Warren, which lies in the eastern part of the town, and Caldwell Pond in the southern part.

Alstead's climate is temperate. Average summer temperature is 65 degrees Fahrenheit and 20 degrees in the winter. Average annual precipitation is 40 inches and the average annual snowfall is 66 inches.

A three-member Select Board governs the Town of Alstead. The closest hospital is Cheshire Medical Center/Dartmouth-Hitchcock located in Keene, 18 miles south of Alstead.



### Disaster Risk

Alstead is prone to a variety of man-made and natural hazards. The natural hazards include: flooding, drought, earthquakes, extreme temperatures, high wind events, infectious disease, landslide, lightning, severe winter weather, solar storms/space weather, tropical storms, wildfire. Technological and human-caused hazards include aging infrastructure, conflagration, dam failure, cyber-attack, mass casualty incident, terrorism/violence, and transport accident.

Flooding, whether from heavy rains or ice jams, carries the greatest risk for Alstead. Seasonal flooding of the many small streams has not been recorded. However, in October 2005, a major flooding event caused some fatalities and destroyed or damaged several structures. This particular event was declared a presidential disaster on October 26, 2005 and several recovery efforts have been put in place by the town, state and federal agencies.

Severe wind events, hurricane residuals and downbursts have caused damage to Alstead. Over the years unrecorded wind events have caused losses of timber on the many high points throughout Town. The 1938 hurricane is remembered for structural damage.

Wildfire has occurred in the town as well due to the many steep slopes that make up the community's landscape. There have been several undocumented wildfires throughout town in the past 70 years. All western slopes have been identified as having the greatest potential for wildfires due to their geographic orientation and abundant forest resources.

Winter weather has proven to be a regular hazard throughout the town of Alstead each year. According to the National Weather Service, Alstead is susceptible to receiving large volumes of snow from Nor'easters due to its close proximity to the east coast where these storms track. The town has also received a fair share of damage from ice storms in winter months. The ice storm in December 2008 caused downed trees and power lines throughout Alstead, causing power outages for many residents. Some areas were without power for 2-3 weeks.

## **Development Patterns**

The total area of the Town of Alstead is approximately 39 square miles of which 38.5 square miles, or 24,943 acres, constitutes land area. Of this, only 7.1% is presently developed for one or more uses, the remaining acreage being either woodland, land with development constraints, or undeveloped vacant land. The greatest intensity of land development in Alstead has occurred in the areas around the intersections of its heaviest traveled roads. The densest areas of development, and those with the greatest mixture of land uses, are in Alstead and East Alstead, with secondary concentrations in Alstead Center and around Lake Warren which is generally devoted to seasonal type use.

Residential use is widespread throughout the town and is generally located along Alstead's major road network, with particularly dense areas in Alstead village where the smallest lots can be found. Residential development occurs in concentrations along Route 12A north of Alstead Center and in East Alstead, particularly at the intersection of Route 123 and Old Gilsum Road in the village center. In addition to conventional housing, there is a significant number of seasonal homes around the shores of Lake Warren and Newell Pond in East Alstead. Alstead is also the location for a significant number of mobile homes with a mobile home park in East Alstead, several individual units along Route 123 east and in the Cook Hill vicinity.

Commercial activity is primarily located in Alstead Village, generally along Route 123, with only sparse occurrences in East Alstead and near the Alstead-Gilsum town line. The commercial uses are, for the most part, oriented to town services such as grocery stores, gasoline stations and real estate offices. There are no major industrial uses in Alstead. Most industrial activity is borderline and is represented by the fabricators of "post and beam" houses and machine shops.

Public uses are spread throughout town with most of the governmental functions being situated in Alstead Village, which is the location of the town hall, library, post office, fire station, town offices, Vilas and Alstead schools and the town's solid waste disposal. There is a fire station in East Alstead and the highway garage is located on Route 123 east of the village area.

Roads and highways are significant contributors to the land use pattern of the Town of Alstead. These right-of-ways, as they spread throughout town, service already developed areas and influence continuing and future development as they provide easy access to places of employment, shopping, and entertainment centers outside of Alstead.

The table below classifies land uses in Alstead and tabulates the quantity of land devoted to each use.

Land Use	Acres	% of Total Acres of Developed Land
Residential	455	25.5%
Agricultural	802	45%
Commercial	36	2%
Institutional/Government	41	2.3%
Recreational	14	0.7%
Roads & Highways	436	24.5%
<b>Total Developed Land</b>	<b>1,784</b>	<b>100%</b>

Source: Alstead Master Plan

## Consideration for Development

Several factors have played, and will continue to play, an important role in the development of Alstead. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, poor soil conditions, land set aside for conservation; and the availability of utilities such as public water and sanitary sewers. These factors have an impact, both individually and cumulatively, on where and how development occurs.

## Population Trends

The following table shows the population in Alstead, Cheshire County, and the State of New Hampshire between the years of 1970 and 2020 based on US Census data. The trend in Alstead is a decline in population since 2000 resulting in a loss of 80 residents.

**Population Trends 1970 to 2020**

	1970	1980	1990	2000	2010	2020	% Change 1970-2020
Alstead	1,185	1,461	1,721	1,944	1,937	1,864	57.3%
Cheshire County	52,364	62,116	70,121	73,825	77,117	76,458	46.0%
New Hampshire	737,681	920,610	1,109,252	1,235,786	1,316,256	1,377,529	86.7%

Source: US Census 2020; NH OPD tables

## Population Projections

Population projections are an important component in planning for the future. Projections are beneficial to help communities begin to plan and budget for Capital Improvement Projects. Since population projections are based on a set of assumptions, changes can be significant if the assumptions used in the calculations are not met. For example, a tropical storm that destroys a large employer or causes infrastructure damages to that facility can cause a significant economic hardship to the business that may ultimately result in its closure and loss of jobs. This can then result in an outward migration of residents from the community. Therefore, population projections should only be used as a basis to begin planning for the future. The New Hampshire Office of Planning and Development (NH OPD) prepares population projections for each

community in New Hampshire. The table below indicates that the population of Alstead is expected to see a decline in population during the next thirty years.

**Population Projections 2020 to 2050**

	2020	2025	2030	2035	2040	2045	2050	% Change 2020-2050
Alstead	1,864	1,701	1,714	1,708	1,685	1,651	1,615	-13.4%
Cheshire County	76,458	77,722	78,340	78,080	77,007	75,452	73,805	-3.5%
New Hampshire	1,377,533	1,430,601	1,473,286	1,501,045	1,511,770	1,509,955	1,501,909	9%

Source: NH OPD September 2022 (most current projections)

**Current Development Trends**

The pattern and distribution of land use in Alstead has not changed appreciably over the last twenty years. Residential development continues to be the primary (active) land use. Residential development in the coming years is expected to come in the form of single-family homes scattered along available road frontage throughout the town. It is not anticipated that Alstead will see a great deal of major subdivision activity or large-scale land development. Most growth will continue to occur as the establishment of single homes on individual lots along with small residential subdivisions. Alstead’s future land use plan does not designate specific areas of the town to accommodate new growth. Rather, it outlines general policies regarding the future development of land.

The table below shows the number of housing units as reported in the decennial census from 1970 to 2020. Alstead and Cheshire County are well below the percent of change in housing units that New Hampshire experienced during the same period.

**Total Housing Units**

	1970	1980	1990	2000	2010	2020	% Change 1970-2020
Alstead	494	595	846	941	991	975	97.4%
Cheshire County	20,202	25,368	30,350	31,876	34,773	35,612	76.3%
New Hampshire	280,962	386,381	503,904	574,024	614,754	638,795	127.4%

Source: NH OPD Current Estimates and Trends in New Hampshire's Housing Supply: Update 2021 most current data available.

**Development in Hazard Areas**

Hazards identified in this plan are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. Since the adoption of the floodplain management ordinance on March 11, 2003 and amended on March 8, 2005, no building permits have been issued for properties built

in the floodplains. All buildings located in the floodplains have been built prior to the town's adoption of regulations.

## National Flood Insurance Program (NFIP)

Alstead has been a participating member of the National Flood Insurance Program since April 2, 1986. Digital Flood Insurance Rate Maps (DFIRMs), with the effective date of May 23, 2006, are used for flood insurance purposes. As of June 2017, there are approximately 26 structures located in the FEMA designated Special Flood Hazard Areas (SFHA's), and 4 NFIP Policies totaling \$1,350,000. There are currently no "Repetitive Loss Properties" insured under the NFIP within the Town of Alstead.

## Continued Compliance with NFIP Requirements

The Town of Alstead acknowledges the importance of maintaining requirements set forth in the National Flood Insurance Program. As such, the Town took steps related to continued compliance with the program that will help to reduce or eliminate the potential for loss of life and property due to flooding.

The Status Update on pages 34-35 show measures that have already been taken including culvert replacement/upsizing on Homestead Road, as well as others; ditching improvements; flood training events attended by members of the Select Board; and outreach of NFIP material. The Alstead Hazard Mitigation Work Group feels that the upsizing of this culvert, as well as other actions that have been done since the previous plan, have helped to reduce the town's hazard risk.

While this update continues with structural projects, public outreach and education are also seen as a key to providing information to residents by raising an awareness of measures that they can take. Many of these items will be on-going actions to maintain awareness and continued monitoring.



## Chapter 3

# Assessing Probability, Severity and Risk

### Risk Assessment

The Hazard Mitigation Work Group met to discuss the Towns' risk assessment and assign rating scores. Consideration was given to climate change, current capabilities, Town assets and critical infrastructure, and previous occurrences when determining the scale of impacts and overall risk. The following terms were used to analyze the hazards:

**Impacts:** The Impact is an estimate generally based on a hazard's effect on humans, property and businesses.

#### Impact Scoring

- 1 - Inconvenience, reduced service/productivity, minor damages, non-life-threatening injuries.
- 3 - Moderate to major damages, temporary closure and reduced service/productivity, moderate number of injuries, and deaths.
- 6 - Devastation and significant injuries and deaths, permanent closure and/or relocation of services, long-term effects.

**Probability of Occurrence:** The Probability of Occurrence is a numeric value that represents the likelihood that the given hazard will occur within the next 10 years.

#### Probability Scoring

- 1 - 33% probability of occurring within 10 years (Low)
- 3 - 34-66% probability of occurring within 10 years (Medium)
- 6 - 67-100% probability of occurring within 10 years (High)

**Severity:** Severity is calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

**Risk:** Risk is an adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 10 years. It is calculated by multiplying the probability of occurrence and severity.

**Overall Risk:** The Overall Risk is a representation of the combined potential impact and probability of occurrence ratings. This is calculated by multiplying the probability of occurrence rating score by the impact rating score (the average of human, property and business impacts). The goal of identifying the overall risk of each identified hazard is to assist the Town in determining which hazards pose the largest potential threat. The overall risk ratings are broken down and color coded into the following categories:

White: values 1 - 9, Low Risk

Yellow: values 10 - 19, Medium Risk

Red: values 20+, High Risk

Risk Assessment Matrix

	Threat/Hazard	Classification	Human Impact	Property Impact	Economic/ Business Impact	Average Impact Score	Probability of Occurrence	Overall Risk
Natural Hazards	Flooding	High	6	6	6	6	6	36
	Drought	Medium	2	3	3	2.7	6	16
	Earthquakes	Low	1	1	1	1	6	6
	Extreme Temperatures	Medium	4	2	2	2.7	6	16
	High Wind Events	Medium	3	3	3	3	6	18
	Infectious Disease	Medium	3	1	1	1.7	6	10
	Erosion/Landslide	Medium	2	3	2	2.3	6	14
	Lightning	Low	1	1	1	1	6	6
	Severe Winter Weather	Low	2	1	1	1.3	6	8
	Solar Storms & Space Weather	Medium	1	3	3	2.3	3	14
	Tropical Storms and Hurricanes	Medium	3	3	3	3	5	15
	Wildfire	Medium	2	3	2	2.3	5	12
Technological Hazards	Aging Infrastructure	Medium	2	3	2	2.3	6	14
	Conflagration	Medium	3	5	3	3.7	3	11
	Dam Failure	Medium	3	3	3	3	6	18
	Known & Emerging Contaminants	Low	1	1	1	1	1	1
	Hazardous Materials	Low	1	1	1	1	1	1
	Long-term Utility Outage (1 week)	Low	1	1	1	1	1	1
	Radiological	Low	1	1	1	1	1	1
Human-Caused Hazards	Cyber Event	Low	1	1	3	1.7	3	5
	Mass Casualty Incident	Medium	4	1	2	2.3	6	14
	Terrorism/Violence	Medium	4	1	2	2.3	6	14
	Transport Accident	Medium	4	1	1	2	6	12

## Chapter 4

# Hazard Identification and Potential Hazards

### Past and Potential Hazards in Alstead

The Alstead Hazard Mitigation Work Group discussed hazard events that have occurred within the last five years. They also looked at the type of hazards that could occur within Town. These hazards were identified by using the New Hampshire Hazard Mitigation Plan (2018), the Federal Emergency Management Agency website, the previous Alstead Hazard Mitigation Plan, and the Alstead Hazard Risk Assessment. From this list, the work group developed a summary for each hazard type to provide information on past and potential events, risk and impact. In some instances, specific locations of hazard events that have occurred within the past five years have been recorded. Estimates of the impact of some of the events is also noted where possible.

Information in this chapter is only given for the medium and high-risk natural hazards identified in the previous chapter. These include: flooding, drought, extreme temperatures, high wind, infectious disease, landslide, severe winter weather, tropical storms/hurricanes, and wildfires. Hazards that ranked as low-risk hazards are not included in the remaining chapters of this plan because the Alstead Hazard Mitigation Work Group felt that the risk was so minimal that resources and efforts would be better utilized on the higher-ranking hazards. The low-risk natural hazards include: earthquake, lightning, severe winter weather, and solar storms and space weather. The Work Group also identified the following medium and high-ranked technological hazards and human-caused hazards that have occurred in Town or have the potential to occur: aging infrastructure, conflagration, mass casualty, terrorism/violence, and transport accident.

Existing and future structures have the potential of being affected by some of the hazards identified in this Plan. Some hazards identified in this Plan are regional or town-wide risks and, as such, all structures, infrastructure and critical facilities fall into the hazard area. As the population continues to grow, new development has been outside of the flood prone areas which has helped to protect the residents from any increase in vulnerability of hazards. However, as the intensity of storms continues to increase, it is important to review the existing programs and strategies, and improve upon areas that are needed.

#### **Flooding**

Risk: High

Impact: High

Future Probability: High

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop 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 heavy rainfall and melting of snow; however, floods can occur at any time of the year.

Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The 100-year flood does not mean that a significant flood will occur once every 100 years. It is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. Instead, it means that there is a 1% chance of a flood of that size happening in any year.

Past Events:

July 1-2, 2017: FEMA Disaster Declaration #4329 for Grafton County. Heavy rains occurred, but no local impact to Town services and no structural damages, injuries, or death were reported due to this event.

October 29 to November 1, 2017: FEMA Disaster Declaration #4355 for Belknap, Carroll, Sullivan, Grafton, and Coos County. Heavy rains occurred, but no local impact to Town services and no structural damages, injuries, or death were reported due to this event.

March 2, 2018: Heavy rains occurred causing minor road closures for a few hours. There were no structural damages, injuries, or deaths reported due to this event.

July 17-19, 2021: FEMA Disaster Declaration #4622. Alstead received approximately 5 inches of rain within a sixteen-hour period. This challenged the stormwater management on several roads and culverts resulting in minor detours, but there were no reports of structural damage, injuries or death due to this storm event.

July 29-August 2, 2021: FEMA Disaster Declaration #4624. Alstead received approximately 5 inches of additional rain which created an overload to the amount of stormwater that the groundwater table and streams could absorb. This caused water to overtop roads resulting in several washouts and the erosion of some gravel roads, paved roads, shoulders and ditches.

Potential Occurrences:

Annual events due to heavy rains and snow melt continue to challenge the capacity and integrity of the existing stormwater infrastructure in the following locations:

Old Settlers Road

- Potential annual event due to heavy rain and runoff
- Potential for damage/repair to the culvert and road surface

Route 123 (East part of town)

- Potential annual event due to heavy rain and runoff
- Potential for damage/repair to the culvert and road surface

Thayer Brook Road (northern section)

- Potential event due to heavy rain and runoff
- Potential damage/repair to the bridge and road surface

North Road

- Potential event due to heavy rains and runoff
- Potential damage/repair to the culvert and road surface

NH 123

- Potential annual event due to heavy rain and runoff
- Potential for damage/repair to the road surface and bridge

Southwoods Road - The 4-foot culvert failed and overtopped many times in the last 10 years.

- Potential event due to heavy rain and runoff
- Potential damage/repair to the culvert and road surface

Camp Brook Road, Homestead Road, and Corbin Road - These are roads that have had culvert problems and roadway damage or flooding in the past. Culvert replacement and ditching improvements have been made at each location and no new incidents have occurred. There were no structures at risk and no injuries with any of the past incidents. Although the problem areas appear to be remedied, the Town determined that these should remain in this plan to observe for future incidents.

Pratt and Walpole Valley Road

- Potential event due to heavy rains and runoff
- Potential damage/repair to the culvert and road surface; there are three culverts that should be replaced with a concrete structure

Warren Brook (between Cobb Hill Road and Chase Mill) - Erosion caused by the 2005 floods impacted both sides of the riverbank. The State has mitigated some, but some areas are still a potential threat. There are approximately 7 structures that could be impacted by flood waters.

- Potential event due to heavy rains and runoff
- Potential damage/repair to the culvert and road surface

The Cold River (between Vilas Pool and the Langdon Town Line) - There are approximately 30-40 structures that could be impacted if a heavy flood event were to occur.

- Potential event due to heavy rains and runoff
- Potential damage/repair to the culvert and road surface

Route 123 (Just east of the village center) - Two locations (culverts) along Route 123 have been impacted during a thunderstorm in 1990. In one location, the water flooded a house and in the other the road washed out. The NH Department of Transportation has plans to repair the two culverts at these locations in the near future. After their repair, the potential for future flooding should be removed and the Town will not be required to perform any work. Route 123 is a state-owned highway.

Potential Impact:

- There is a potential for injuries and loss of life, structural damage and interruption of services.
- There is potential for damage/repair to the road surface and flooding of roads due to accumulation of heavy rain and runoff which could cause a delay in the response time of emergency services.
- There is a potential for economic loss caused by flooded crops.

### Drought

Risk: Medium

Impact: Medium

Future Probability: High

Droughts are a natural hazard that impacts the entire Town. A greater emphasis is placed on responding to these hazards rather than mitigating for them. Outreach and education on methods of dealing with drought are important. The severity of droughts can be found by referring to the Palmer Drought Severity Index and can be viewed at: [http://www.cpc.ncep.noaa.gov/products/monitoring\\_and\\_data/drought.shtml](http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml). Below is the Intensity Scale that is used with the Palmer Drought Severity Index to describe the observed impact with each category.

#### Palmer Drought Severity Index

Category	Intensity	Impact
D0	Abnormally Dry	Crop growth is stunted; fire danger is elevated; lawns brown and gardens wilt; surface water levels are lower.
D1	Moderate Drought	Wildfires and brush fires increase; increased use of irrigation for crops; hay and grain yields are lower; honey production declines; trees and fish are stressed making them susceptible to disease; water conservation is recommended.
D2	Severe Drought	Water quality and quantity declines; irrigation ponds are dry and hay crops are impacted causing economic hardship to farms; crop yields and size of fruit are reduced; outdoor burning is limited; air quality is poor; impact on the health of trees and wildlife is observed.

Category	Intensity	Impact
D3	Extreme Drought	Crop loss, farms are stressed and are experiencing a financial impact; extremely reduced flow or ceased flow of water; river temperatures are warm; wildlife disease is increased; many wells are dry; new and deeper wells are needed.
D4	Exceptional Drought	NH has little or no experience in D4, so no impacts have been recorded at this level.

Source: NOAA

Past Events:

- Summer 2022 - drought conditions existed throughout New Hampshire. The drought had an impact to Lake Warren causing a cyanobacteria bloom. It also had an impact to the agricultural fields causing small and immature crops.
- Summer 2021 - drought conditions had an impact to the agricultural fields causing small and immature crops.
- Summer of 2020 - drought conditions existed throughout New Hampshire. Impact to agriculture fields causing small crops and an increased cost for irrigation. A few wells ran dry.
- Summer of 2018 - drought conditions existed throughout New Hampshire. Impact to agriculture fields causing small crops and an increased cost for irrigation. Many wells ran dry and the Fire Chief delivered water to several residents that had no water.

Potential Occurrences:

- This is a recurring event that impacts the entire Town. Areas of concern are farms, residents with wells and wooded areas.

Potential Impact:

- Drought will increase the risk of wildfire, especially in areas of high recreational use and as more timberland is set aside as non-harvested timberland.
- Some private wells may run dry.
- Minimal impact to Town services.

**Erosion/Landslides**

Risk: Medium

Impact: Low

Future Probability: High

**Erosion - Medium Risk:** The shoreline of the Warren Brook and the Cold River have been seriously impacted by the flood of October 2005. There is a great potential for more erosion of the river banks by heavy rain and/or spring runoff if not mitigated. Every watercourse in Town was impacted by that flood and could potentially see additional erosion in the future.

- There is a potential for mud and debris to enter the streams
- There is a potential for mud and debris onto roads

Potential Occurrences: The following locations have the potential for impact from erosion or landslide: Warren Brook (between Cobb Hill Road and Chase Mill) - Erosion caused by the 2005 floods impacted both sides of the riverbank. The State has mitigated some, but some areas are still a potential threat. There are approximately 7 structures that could be impacted by flood waters and/or erosion.

The Cold River (between Vilas Pool and the Langdon Town Line) - There are approximately 30-40 structures that could be impacted by erosion if a heavy rain event were to occur.

Route 12A - Erosion has taken out the road in this area. Several times portions of this road have been rebuilt. Some work has been done by the state to mitigate impact from future events. Rocks have been put in place to stop erosion in this area. No structures are at risk.

Along the Cold River - Erosion caused by the October 2005 flooding. Impacted both sides of the river in the downtown area. Approximately six structures could be at risk.

Chase Mill/Cobb Hill Road (along Warren Brook) - Erosion caused by the October 2005 flooding impacted an area between Chase Mill and Cobb Hill Road. The State has mitigated some areas, but the area between Chase Mill and Cobb Hill Road still has the potential for erosion. No structures are at risk.

43 Cook Hill Road - There is a potential for the house at this site to slide down the steep slope as the erosion to this area increases.

**Landslide** - Landslides are mainly due to constant logging on a clay soil with the presence of steep slopes. There is a potential for structural damage, injury, or death.

Route 123 (State Road) - There is one house located in this area that could be affected by a landslide incident.

Griffin Hill Road - A landslide previously washed out the road causing detours, but no death, injury or damage to structures. The road has been rebuilt since the landslide; however, this area should be monitored for potential future incidents.

Hill Road at the bottom of Bell Hill - There are two areas that have had approximately 20' of landslide (erosion) since 2012. There are no structures that could be affected, but the road is at risk.

Bell Hill near Darby Brook - Landslide happens on a regular basis due to the clay soil base. There are two houses located in this area that could be affected by a landslide incident.

Off Route 123 - Man-made, piling up against homes since their construction. There is one structure located in this area that could be affected by a landslide incident.

Melody Lane - A landslide happened in this location during the October 2005 flooding events and is still a great potential. Extensive streambank stabilization has been done since the 2005 event. There is one house located in this area that could be affected by a landslide incident.

Thayer Brook Road - Erosion/landslide in these two areas has not affected homes but could potentially affect the road again. NRCS has done some mitigation following the October 2005 flooding event.

### **Extreme Temperatures**

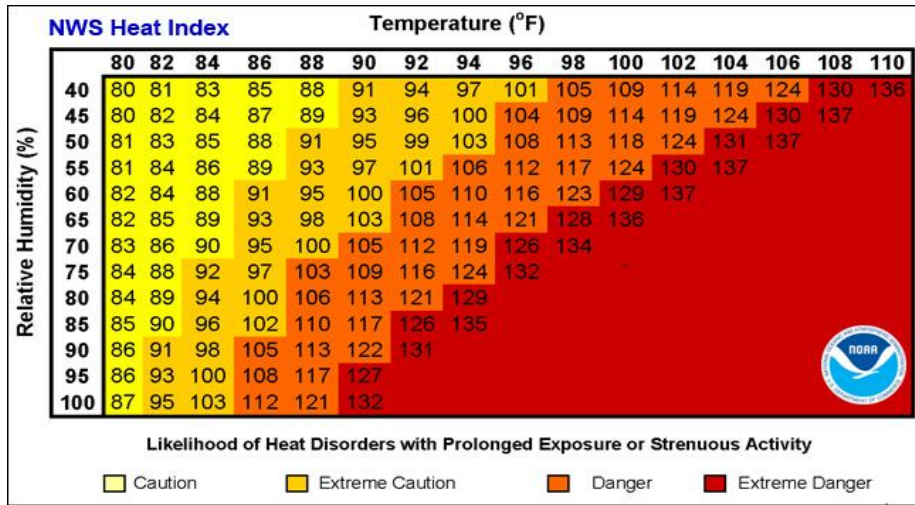
Risk: Medium

Impact: Medium

Future probability: High

**Extreme heat** is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. Although it is an infrequent event, it usually occurs on an annual basis between late July and August and happens town wide. The severity of extreme heat can be dangerous to those residents with medical conditions and the elderly. It is important to have cooling areas and a good supply of water available. Extreme heat can add to the potential for wildfires and depletion of the water supply for firefighting. The Alstead Hazard Mitigation Work Group did not recall any impact to the Town services

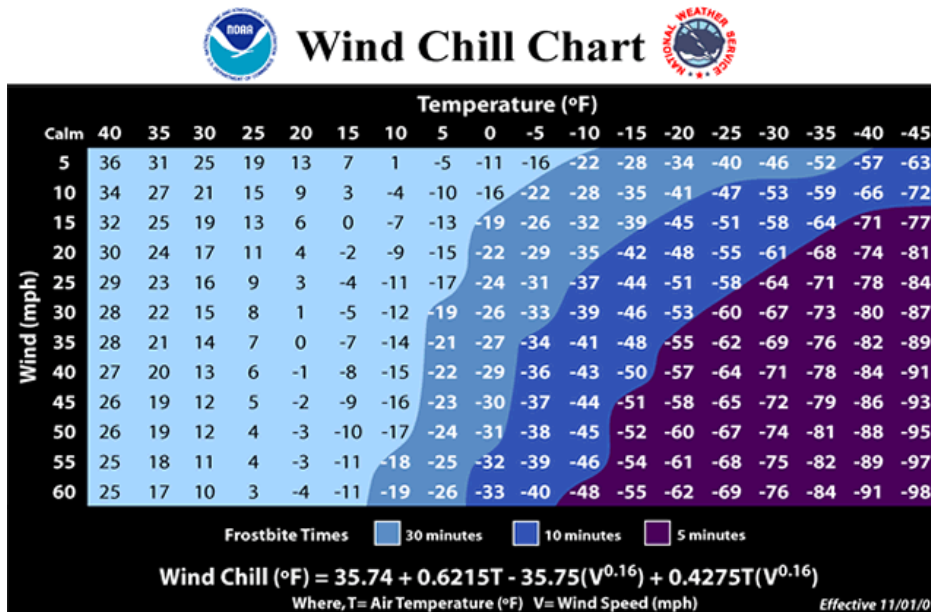
due to this hazard. They also did not recall any death, injuries or structural damage as a result of extreme heat. The NWS Heat Index is an indicator of the likeliness of heat disorders with prolonged exposure or strenuous activity, especially for those with a history of stroke and heart issues.



Source: National Weather Service

**Extreme Cold** events occur during meteorological cold waves, also known as cold snaps that are caused by the southern transport of arctic airmasses into the Northeast. These events are most common in winter months and increase the likelihood of cold disorders in humans and animals that have prolonged exposure to low ambient temperatures. Cold disorders can include frostbite and hypothermia which can eventually lead to death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

The Wind Chill Chart below shows the impact that wind and cold temperatures can have by indicating the number of minutes until frostbite strikes.



Source: National Weather Service



Past Events:

- There have been no impactful events of extreme heat or cold that the Work Group recalled since the last plan update.

Potential Occurrences:

- Extreme temperatures are a town-wide event.

Potential Impact:

- Higher elevations are impacted more by extreme temperatures.
- Vulnerable populations are at greater risk.
- High heat causes an increase in EMS calls.

**High Wind, Tornado, Downburst**

Risk: Medium

Impact: Medium

Future probability: High

The Enhanced Fujita Scale is used to determine the intensity of tornadoes. Most tornadoes are in the F0 to F2 Class. Building to modern wind standards provides significant property protection from these hazard events. New Hampshire is located within Zone 2 for Design Wind Speed for Community Shelters, which is 160 mph, and is also noted as being within a hurricane susceptible region.

Past events (regional):

- The southwestern portion of the state is considered a special wind hazard area as demonstrated by the high proportion of tornadoes and severe wind events that are experienced in this Region annually. On July 3, 1997 several tornadoes struck this region of the State. An F1 tornado caused severe tree loss in Swanzey, destroying a building and damaging the stables at the Cheshire Fairgrounds. Although outside the Southwest Region, the 2008 Barnstead tornado caused significant damage and also involved loss of life. Therefore, this is a real hazard and the damage it could inflict should not to be taken lightly.

Local events:

2019 - There was a tornado in Acworth that caused minor impact to Alstead with downed trees and debris clearance from the roadways.

Potential Occurrences:

- River corridors and hill tops are more susceptible.
- This is a town wide event; therefore, no specific locations are listed.

Potential Impact:

- There is a potential for structural damage;
- There is a potential for loss of life and property as well as disruption of utility service; and
- Such events cause small blocks of downed timber.

The **Enhance Fajita Scale** is used to rate the intensity of a tornado by examining the damage caused by the tornado once it has passed.

**EF-0**: Wind speed 65-85 mph.; frequency 53.5%. Minor damage.

**EF-1**: Wind speed 86-101 mph.; frequency 31.6%. Moderate damage.

**EF-2**: Wind speed 111-135 mph.; frequency 10.0%. Considerable damage.

**EF-3**: Wind speed 136-165 mph.; frequency 3.4%. Severe damage.

**EF-4:** Wind speed 166-200 mph.; frequency 0.7%. Extreme damage.

**EF-5:** Wind speed >200 mph.; frequency 0.1%. Total destruction.

### **Infectious Disease**

Risk: Medium

Impact: Low

Future probability: High

Epidemics may be caused by infectious diseases, which can be transmitted through food, water, the environment or person-to-person or animal-to-person; and noninfectious diseases, such as a chemical exposure, that causes increased rates of illness. Infectious diseases that may cause an epidemic can be broadly categorized into the following groups:

- Foodborne (Salmonellosis, E. Coli)
- Water (Cholera, Giardiasis)
- Vaccine Preventable (Measles, Mumps)
- Sexually Transmitted (HIV, Syphilis)
- Person-to-Person (TB, meningitis)
- Arthropod borne (Lyme, West Nile Virus)
- Zoonotic (Rabies, Psittacosis)
- Opportunistic fungal and fungal infections (Candidiasis)

Extent:

The magnitude and severity of infectious diseases is described by its speed of onset (how quickly people become sick or cases that are reported) and how widespread the infection is. Some infectious diseases are inherently more dangerous and deadly than others, but the best way to describe the extent of infectious diseases relates to the disease occurrence:

- Endemic - Constant presence and/or usual prevalence of a disease or infection agent in a population within a geographic area
- Hyperendemic - The persistent, high levels of disease occurrence
- Cluster - 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
- Epidemic - An increase, usually sudden, in the number of cases of a disease above what is normally expected
- Outbreak - The same as epidemic, but over a much smaller geographical area
- Pandemic - Epidemic that has spread over several countries or continents, usually affecting many people

Past Events:

January 20, 2020 and continuing; COVID-19 PANDEMIC (DR-4516-NH) Major Disaster Declaration declared on April 3, 2020. The Covid-19 Pandemic that began in 2020 resulted in numerous residents to become ill and also some deaths in Town. In addition, it created economic hardship for many due to loss of work, school closures and business closures. This pandemic is still occurring, so data will be forthcoming in the next update of this Plan.

Potential Occurrences:

- This is a town wide event; therefore, no specific locations are listed.

Potential Impact:

- Those with weakened immune systems are at greater risk during these events.

- There is a potential for injury or death to people, domestic animals and wildlife.
- There is a potential for risk to waterbodies and wildlife habitat.
- There is a potential for loss of crops and vegetation, and economic disparity.

**Lightning**

Risk: Low

Impact: Low

Future probability: High

Lightning is a natural hazard that is unpredictable. It could strike anywhere during a storm and potentially start a forest fire, especially in periods of drought. High elevations and areas around waterbodies may be more susceptible to lightning strike incidents. The table below categorizes lightning hazards according to the Lightning Activity Level (LAL) using cloud conditions and precipitation, and an estimate of lightning strikes per every 15 minutes.

LAL	Cloud & Storm Development	Lightning Strikes/15 min.
1	No thunderstorms.	---
2	Cumulus clouds are common but few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. 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 3 must occur within the observation area. Moderate rain is common & 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 but thunderstorms are dry.	16 - 25

Source: NOAA

Past Events:

Summer of 2019: Lightning struck a tree on Murphy Hill Road which caused a wildfire that burned approximately ¾ acre. There were no injuries, death, or structural damage cause by this incident. Mutual aid was needed.

Potential Occurrences:

- Lightning could occur town wide, therefore, no specific locations are identified; however, river corridors and hill tops are more susceptible.
- Antennas and satellites, church steeples, cupolas, and other upward protruding architectural features are at greater risk for lightning strikes.
- Hikers, fisherman and boaters are at risk during lightning events and should seek safe shelter.

Potential Impact:

- Forested areas with a high fuel load are a high risk for forest fire during lightning storms.
- Telephone and power outages often occur when transformers are hit by lightning or when a tree gets struck and falls onto the lines.
- There is a potential for damage to structures.
- There is a potential for injury or death.

**Severe Winter Weather**

Risk: Low

Impact: Low

Future probability: High

Three types of winter events that cause concern are heavy snow, ice storms and extreme cold. Alstead’s recent history has not recorded any loss of life due to the severe winter weather. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

To help prepare for these events, the Sperry Piltz Ice Accumulation Index was created.

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
<b>0</b>	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
<b>1</b>	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
<b>2</b>	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
<b>3</b>	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1-5 days.
<b>4</b>	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structures. Outages lasting 5-10 days.
<b>5</b>	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

Past Events:

- March 14-15, 2017 - Heavy snow and wind occurred throughout the state. There were no injuries or structural damage reported as a result of the storm.
- March 13-14, 2018 - Heavy snow storm but no local impact. FEMA Disaster Declaration # DR-4371 for Carroll, Strafford and Rockingham Counties.

Potential Occurrences:

Four areas in Alstead could potentially be impacted more heavily by ice storms because of the important forested land: East side of Town, Cobb Hill area, Route 12A and Pratt Road areas, and Southwest area of town.

- Power outages could occur due to heavy snow and ice on power lines
- The entire town is at risk
- Impacts the emergency response reaction time

Potential Impact:

- There is a potential for interruption of service.
- There is a potential of damage to structures.
- There is a potential for injury or death.
- The freezing and thawing increases repair and maintenance costs on the town budget.

**Solar Storm and Space Weather**

Risk: Low

Impact: Low

Future probability: Medium

The term space weather is relatively new and describes the dynamic conditions in the Earth’s outer space environment, similar to how the terms “climate” and “weather” refer to the conditions in the Earth’s lower atmosphere. Space weather includes any conditions and events on the sun, in the solar wind, in near-Earth space, and upper atmosphere that can affect space-borne and ground based technological systems.

The chart on the next page shows the level of severity of space weather as it relates to the impact on radio communications. The National Oceanic and Atmospheric Administration (NOAA) uses this chart to alert those who depend on radio communications such as first responders and airlines on days that could create life threatening situations if their radios are impacted.

**Radio Blackout**

Scale	Description	Effect	Physical measure	Average Frequency (1 cycle = 11 years)
R 5	<b>Extreme</b>	<b>HF Radio:</b> 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 en route aviators in this sector. <b>Navigation:</b> Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	X20 ( $2 \times 10^{-3}$ )	Less than 1 per cycle
R 4	<b>Severe</b>	<b>HF Radio:</b> HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. <b>Navigation:</b> Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	X10 ( $10^{-3}$ )	8 per cycle (8 days per cycle)
R 3	<b>Strong</b>	<b>HF Radio:</b> Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. <b>Navigation:</b> Low-frequency navigation signals degraded for about an hour.	X1 ( $10^{-4}$ )	175 per cycle (140 days per cycle)
R 2	<b>Moderate</b>	<b>HF Radio:</b> Limited blackout of HF radio communication on sunlit side, loss of radio contact for tens of minutes. <b>Navigation:</b> Degradation of low-frequency navigation signals for tens of minutes.	M5 ( $5 \times 10^{-5}$ )	350 per cycle (300 days per cycle)
R 1	<b>Minor</b>	<b>HF Radio:</b> Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact. <b>Navigation:</b> Low-frequency navigation signals degraded for brief intervals.	M1 ( $10^{-5}$ )	2000 per cycle (950 days per cycle)

Source: National Oceanic and Atmospheric Administration (NOAA)

This is a new hazard added to this plan. It is anticipated that this will be discussed further in future plans.

Past Events:

- This is a hazard that is difficult to detect and the Work Group was not aware of any specific dates of occurrence. There have been no incidents of damage or interruption of communication services recorded in Alstead.

Potential Occurrences:

- The entire Town is at risk for solar storms and space weather. There is a concern for disruption in emergency services communications and businesses that rely on the internet.

Potential Impact:

- There is a potential for interruption of service.
- Solar storms and space weather can impact the connections for emergency services. It can also impact the wells and tanks which communicate by radio.

**Tropical Storm/Hurricane**

Risk: Medium

Impact: Medium

Future probability: High

There is concern for tropical storms and hurricanes to impact Alstead. Alstead's inland location in southwestern New Hampshire reduces the risk of extreme high winds that are associated with hurricanes. A major hurricane can cause significant damage to a community. Most of the damage is caused by high water and high winds.

Past Events from 2016 to present:

- The Town has experienced small blocks of downed timber and uprooting of trees onto structures in the past, however, there have been no occurrences of tropical storms or hurricanes in the past five years that have impacted Alstead.

Potential Occurrences:

- River corridors and hill tops are more susceptible.
- This is a town wide event; therefore, no specific locations are listed.

Potential Impact:

- There is a potential for injury or death;
- There is a potential for structural damage and disruption of utility service.
- There is a potential for flooding of evacuation routes and other roads.

**Saffir-Simpson Hurricane Wind Scale**

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating system 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.

Category 1

Wind Speed: 74 - 95 mph, 64 - 82 kts

Very dangerous winds will produce some damage. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.

Category 2

Wind Speed: 96 - 110 mph, 83 - 95 kts

Extremely dangerous winds will cause extensive damage. Near-total power loss is expected with outages that could last from several days to weeks.

Category 3

Wind Speed: 111 - 129 mph, 96 - 112 kts

Devastating damage will occur. Electricity and water will be unavailable for several days to weeks after the storm passes.

Category 4

Wind Speed: 130 - 156 mph, 113 - 136 kts

Catastrophic damage will occur. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Category 5

Wind Speed: 157 mph or higher, 137 kts or higher

Catastrophic damage will occur. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: <http://www.nhc.noaa.gov/aboutsshws.php>

**Wildfire**

Risk: Medium

Impact: Low

Future probability: High

The whole Town is at risk for wildfires. There is a substantial amount of debris on the ground from the ice storms of 1998 and 2008, wind shears, heavy winds, and logging practices. As timber harvesting is reduced, wood roads close and debris builds up on the ground, the potential for wildfire increases town-wide.

Past Events:

- August 2022 - There was a small wildfire on Rose Apple Lane that burned an area of approximately 40'x40' due to the dryness of the drought. There were no deaths, injuries, or structural damage but Gilsum Mutual Aid was needed to assist.

Potential Occurrences: The potential for a wildfire is higher in the forested areas of Alstead;

- A lack of direct access to many remote areas within Town adds to the danger.

Potential Impact:

- There is a potential for the risk of life and property loss;
- There is a potential for loss of wildlife habitat and timber; and
- There is a potential for disruption of utility service.

Wildfires are classified according to size: Class A - one-fourth acre or less; Class B - greater than one-fourth acre, but less than 10 acres; Class C - 10 acres or more, but less than 100 acres; Class D - 100 acres or more, but less than 300 acres; Class E - 300 acres or more, but less than 1,000 acres; Class F - 1,000 acres or more, but less than 5,000 acres; Class G - 5,000 acres or more. The wildfires in Alstead have mostly been small in nature and caused by lightning strikes (Class A or B).

**Dam Failure**

Risk: Medium

Impact: Medium

Future probability: High

Dam failure is defined as the sudden, rapid, and uncontrolled release of impounded water.

Past Events from 2018 to present:

- There have been no recent occurrences of dam breach in Town
- Potential annual event due to heavy rain, runoff and ice jams
- Potential for damage/repair to the dam and road surface

Potential Occurrences:

- Vilas Pool Dam (Near Route 123A) - The dam has overtopped once every 10 to 15 years. The overtopping was either due to an ice jam or heavy rain storm. There is one house located in this area that could be affected by a flood incident.
- Lake Warren Dam - this is rated as a Class S Dam. A dam breach could impact more than 10 homes.

Potential Impact:

- There is a potential for the risk of life and property loss;
- There is a potential for disruption of utility service.

Dam Classifications: NM - Non-menace; L - Low hazard; S - Significant hazard; H - High Hazard. Generally, all Class H dams need to have Emergency Action Plans, and most Class S dams also require them. There are two Class S dams and no Class H dams and in Alstead according to the Department of Environmental Services Dam Bureau. The Class S dams are the Warren Lake Dam and Vilas Pool Dam. Areas that are downstream from the dams are at greater risk.

Dam #	Hazard Class.	Status	Name	River	Height Ft.	Impnd. Ac.	Dam Owner
D005001		Ruins	Cold River Mill Dam	Cold River	19		Private
D005002		Ruins	Warren Brook Dam	TR Cold River	16		Private
D005003	L	Active	Mill Hollow Dam	Warren Brook	15	0.1	Private
D005004	S	Active	Warren Lake Dam	Warren Brook	10	200.3	Alstead
D005005		Ruins	Warren Brook II Dam	TR Cold River	5		Private
D005006	S	Active	Vilas Pool Dam	Cold River	31	6	Alstead
D005007		Ruins	Cold River Dam	TR Cold River	19		Private
D005008	NM	Active	Lodge Pond Dam	TR Dart Brook	6	0.35	Private
D005009		Not Built	Wildlife Pond Dam	TR Thompson Brook	15.5	3.5	Private
D005010	NM	Active	Smith Pond Dam	Small Brook	8	0.25	Private
D005011	NM	Active	Smith Irrigation Pond Dam	Unnamed Stream	12	0.25	Private
D005012	L	Active	Cranberry Pond Dam	TR Dart Brook	10.75	22	Private
D005013	NM	Active	Amall Rain Brook Dam	Small Rain Brook	9	0.37	Private
D005014	NM	Active	Spring Fed Dam	Unnamed Stream	8	0.09	Private
D005015	NM	Active	Caldwell Pond Dam	TR Dart Brook	3	29	Private
D005016	NM	Active	Moran Farm Pond Dam	Unnamed Stream	10	0.01	Private
D005017	NM	Active	Culin Farm Pond Dam	Runoff	8	0.17	Private

Source: New Hampshire Department of Environmental Services Dam Bureau 2023



# Chapter 5

## Critical Facilities

### Identification and Location of Critical Facilities

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort
- Maintains an existing level of protection from hazards for the community
- Would create a secondary disaster if a hazard were to impact it

Alstead's Hazard Mitigation Work Group has broken up this list of facilities into four categories. The first category contains facilities needed for emergency response in the event of a disaster. The second category contains non-emergency response facilities that have been identified by the Work Group as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Alstead. The third category contains facilities/populations that the Work Group wishes to protect in the event of a disaster. The fourth category contains potential resources, which can provide services or supplies in the event of a disaster. The Critical Facilities Map at the end of this Plan identifies the facilities.

### Category 1 - Emergency Response Services

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural, technical and human-caused hazards.

1. Emergency Operations Center/ Town Office - 15 Mechanic Street
2. Fire Station  
East Alstead Fire Station - 30 North Road  
Alstead Fire Station - 9 Main Street
3. Police Station  
Alstead Police Station - 15 Mechanic Street
4. Emergency Shelters  
Vilas Middle School (not fully equipped) - 82 Mechanic Street  
Fire Stations (2) - 30 North Road and 9 Main Street
5. Evacuation Routes  
NH Route 123  
NH Route 123A  
NH Route 12A
6. Ambulance/Medical Services  
Ambulance Service (housed at the Fire Station) - 9 Main Street
7. Public Works Garage  
Public Works Garage - 595 Forest Road

8. Helicopter Landing Areas
  - Alstead Elementary School - 58 Mechanic Street
  - Millot Green - 15 Mechanic Street
  - Four Corners (East Alstead) - 5 Gilsum Mine Road
  - Hill Road (intersection with Alstead Center Road) - Around 450 Alstead Center Road
9. Public Utilities
  - Eversource/ Liberty Utilities
  - Consolidated Communications - Library Avenue, Alstead
  - Power Lines in the Southwest of Alstead
  - Town Owned Radio Tower - Around 471 Cobb Hill Road
  - Cell Towers: Cobb Hill (near 471 Cobb Hill Road)
    - Alstead Center Road / NH Route 12A (near 775 Alstead Center Road)

## Category 2 - Non-Emergency Response Facilities

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Alstead.

1. Water Supply
  - Trailer Park: Well Hill Co-op - 1 Well Hill Way,
  - Orchard School Public Well - 114 Old Settlers Road
  - Vilas School Public Well - 82 Mechanic Street
2. Bridges of Primary & Secondary Evacuation Routes
  - Gilsum Mine Road
  - Walpole Valley Road
  - Thayer Brook Road
  - Drewsville Road
  - Hill Road
  - Pratt Road
  - Camp Brook Road

## Category 3 - Facilities/Populations to Protect

The third category contains people and facilities that need to be protected in event of a disaster.

1. Special Needs Population
  - Oxygen-dependent people
  - People on a lifeline
  - People assisted by Home Health
  - Shut-ins and disabled
  - Group Homes
  - Mentally challenged
  - Elderly - Elderly Housing Complex 49 Pleasant Street
  - Hearing impaired
  - Sight impaired

## 2.Recreation Areas

Town Green - 15 Mechanic Street  
Vilas Pool - Acworth Road  
Ball Field - 15 Mechanic Street  
Lake Warren  
Newell Pond  
Orchard School -114 Old Settlers Road

## 3.Schools

Alstead Elementary School - 58 Mechanic Street  
Vilas Middle School - 82 Mechanic Street  
Orchard School - 114 Old Settlers Road  
LEAF Charter School -789 Gilsum Mine Road

## 4.Historic Buildings/Sites

Historical Society - 5 High Street  
Library -2 Main Street  
Vilas Pool Park - 39 Acworth Road / NH Route 123A

## 5.Churches

1st Congregational Church- NH 12A (summer only) - RR 1 Route 12A, Alstead Center  
2nd Congregational Church- North Road - 16 North Road  
3rd Congregational Church- River Road - 14 River Road

## Category 4 - Potential Resources

Contains facilities that provide potential resources for services or supplies.

### 1. Food/Water

Alstead General Store - 10 Mechanic Street  
Orchard Hill Bakery - 121 Old Settlers Road  
Vilas School - 82 Mechanic Street  
Food Shelf and Friendly Meals (Langdon) -122 Langdon Road (NH Route 123)

### 2. Hospitals/Medical Supplies

Cheshire Medical Center - Keene  
Dartmouth Hitchcock Hospital - Hanover  
Dartmouth Hitchcock Clinic - Walpole  
Walk-in Clinics - Keene  
Springfield Hospital- Springfield, Vermont  
Bellows Fall, Vt.

3. Heating Fuel Supply

Landry Oil (Langdon) - 260 River Street, Langdon

4. Fuel Supply

Public Works Garage - 595 Forest Road

Gas station - 12 Mechanic Street

5. Lumber Supply

Woodell & Daughters - 85 Jewett Road, Langdon

6. Heavy Equipment

Rock Wilson/Fuller Machine - 5 Gilsum Mine Road

Josh Perry - Langdon

Fuzzy Brothers - Walpole

7. Small Equipment

Andy's Trucking - 13 Arbor Way

Alan Dustin/Dustin's Sugarhouse - 49 Murphy Hill Road

Rock Wilson/Fuller Machine - 5 Gilsum Mine Road

Porter & Sons - 197 Tory Hill Road, Langdon

8. Snow Removal

Josh Perry

Kmiec Garage - 7 Forest Road

## Chapter 6

# Existing Protection

### Description of Existing Programs

Below is a description of the strategies currently being used by the Town of Alstead. These are further reviewed in the Existing Protection Matrix to determine the effectiveness and changes needed.

#### Existing Mitigation Strategies

- **Floodplain Development Ordinance** - An ordinance has been adopted as part of the Town's Land Use Plan to control development in the 100-year floodplain
- **National Flood Insurance Program** - A federally backed program that encourages communities to enact and enforce floodplain regulations.
- **School Evacuation Plan** - Designated plan to evacuate schools in Alstead in the event of an emergency or disaster.
- **Emergency Back-up Power Program** - Alstead has some emergency generators but should obtain additional units for better protection.
- **Local Road Design Standards** - Standards set by the town and the Public Works Department to ensure a constant construction benchmark.
- **Dam Emergency Action Plans** - The Dam Emergency Plans establish evacuation and emergency response procedures in case of a breach---Vilas Pool Dam and Lake Warren Dam
- **Local Road Maintenance Program** - A schedule for routine and priority road maintenance projects based on a five-year projection.
- **Local Bridge Maintenance Program** - The NH DOT inspects all town bridges every year or every two years, and provides a comprehensive report and recommendations for maintenance to the Town.
- **Shoreland Protection Program** - Designates a protective buffer along the shoreline of all surface waters that have been designated.
- **Mutual Aid** - Provides assistance to all aspects of Alstead's Emergency Management Services in town. Southwest New Hampshire Fire Mutual Aid (SWNHFMA) provides mutual aid to Alstead. See 1st, 2nd and 3rd Mutual Aid descriptions in the Existing Protection Matrix for details on each one.
- **Fire Pond Management Plan** - Annual maintenance and testing of local ponds and dry hydrants used by the Fire Department for water supply for fire prevention and suppression.
- **Town Master Plan** - A Guidance document to ensure that overall development in town is sustainable, meeting the needs of the citizens by setting forth steps and guidelines for a sound living environment through intelligent growth.
- **Spill Prevention Control and Counter Measures Plan** - This plan is maintained at the Fire Department in the event that there is a spill. Personnel in the Fire Department are being trained in how to handle hazardous materials spills. SWNHFMA is called upon in the event of a major spill.
- **Ambulance Service** - The Town of Alstead has its own ambulance service.
- **Wetlands Protection** - Alstead requires new development to comply with the State of New Hampshire Wetlands Regulations.
- **Erosion and Sedimentation Plan** - E&S plans are established by the state for erosion and sediment control. A Soil Erosion and Sedimentation Control Plan is required by the Town for all major subdivisions and site plans.
- **Town Radio System/Emergency Radio System** - The existing system has a lot of dead spots in town.
- **Capital Improvement Program** - The Capital Improvement Program classifies projects according to the urgency and need for realization and recommends a strategy for their implementation.

- **Fire Inspector** - Inspections are performed for day care centers following state regulations. They are done on a per request basis.
- **Best Management Practices** are used as provided by the State to prevent non-point sources from affecting the local waterways.
- **Emergency Operations Plan** - The Town developed a document to facilitate the delivery of local government, community, and mutual aid resources, and to provide needed assistance and relief to disaster victims and the community at large.

## Existing Protection Matrix

The Alstead Hazard Mitigation Work Group has developed the summary matrix of existing hazard mitigation strategies presented on the following pages. This matrix, a summary of the preceding information, includes the type of existing protection (Column 1), area covered (Column 2), the responsible local agent (Column 3), the effectiveness of the strategy (Column 4), the recommended changes (Column 5).

Effectiveness of the existing protection is rated Poor, Average, Good or Unknown: Poor- needs improvements; Average- meets general expectations; Good- meets and sometimes exceeds expectations; Unknown- not yet used or unable to quantify effectiveness.

Existing Program/Activity	Area Covered	Local Contact	Effectiveness	Recommended Changes
Floodplain Development Ordinance	Floodplains	Zoning Board, Selectmen, Planning Board	Good	This ordinance should be reviewed by the Planning Board and amended as needed. Amended in 2006.
National Flood Insurance Program (NFIP)	Town-wide	Emergency Management Director	Good	Continue outreach to provide information on NFIP.
School Evacuation Plan	Vilas School and Alstead Elementary	Each School Board	Good	No changes needed at this time.
Emergency Power Back-up Program	Two fire stations, Town offices, and highway garage.	Selectmen	Good	Generator are at the Town Office, two Fire Stations, and the Highway Garage. One is needed at the
Local Road Design Standards	Town-wide	Director of Public Works	Good	Potential need for improved road design standards.
Local Roads Maintenance Program	Town-wide	Director of Public Works	Good	Hazard areas are routinely addressed as priority projects. Additional funding is necessary for maintenance and upgrade of roads.
Local Bridge Maintenance Program	Town-wide	NH DOT, Alstead DPW	Good	The NH DOT should coordinate inspections with local DPW to meet on-site.

Existing Program/Activity	Area Covered	Local Contact	Effectiveness	Recommended Changes
Dam Emergency Action Plans: Vilas Pool Dam Plan (2022) and Lake Warren Dam Plan (update expected in 2023)	Vilas Pool Dam and Lake Warren Dam	EMD Selectmen, DPW	Good	Review both dam emergency action plans, including notification of residents in case of evacuation.
Shoreland Protection Program	Designated waters in town.	NH DES, Selectmen, Planning Board, Conservation Commission	Good	No changes needed at this time.
Mutual Aid-Fire	Town-wide	Fire Department	Good	Improve radio communication (both infrastructure and equipment).
Mutual Aid-Police	Town-wide	Police Department	Good	Improve radio communication (both infrastructure and equipment).
Mutual Aid-Public Works	Town-wide	Director of Public Works (DPW)	Good	No changes needed at this time.
Fire Pond and Dry Hydrant Management	Town-wide	Fire Chief	Good	Consider options to increase water resources such as cisterns and an increase in dry hydrant locations.
Alstead Master Plan (2010)	Town-wide	Planning Board	Good	Consider adding this Plan as a reference in the Master Plan.
Spill Prevention Control and Counter Measures Plan	Town-wide	Fire Chief	Good	Ongoing training. No new mitigation strategy needed.
Ambulance Service	Town-wide	Ambulance Chief	Good	Improve radio communication (both infrastructure and equipment).
Wetlands Protection	Town-wide	Planning Board, Conservation Commission, NHDES	Good	Enforcement of state regulations must be continued. No changes needed at this time.
Erosion and Sedimentation Plans	Town-wide	Planning Board	Good	No changes needed at this time.

Existing Program/Activity	Area Covered	Local Contact	Effectiveness	Improvements/Changes Needed
Town Radio System	Town-wide	Fire Chief, Police Chief, DPW Ambulance Chief,	Poor	Explore new technologies to resolve the communication problems. should consider switching to VHF.
Capital Improvement Program	Town-wide	Planning Board	Average	Continue to annually update the Capital Improvement Program. Should include all capital projects.
Fire Inspector	Town-wide	Fire Chief	Good	Investigate hiring a part-time fire inspector.
Best Management Practices (BMPs)	Town-wide	Director of Public Works	Good	No additional comments at this time.
Emergency Operations Plan	Town-wide	Emergency Management Director	Good	Update the EOP in 2024.

### Status of Previous Priority Mitigation Actions

The following table provides a status update for the Priority Mitigation Actions identified in the 2017 Alstead Hazard Mitigation Plan. Previously identified mitigation actions are noted as completed, deleted, and/or deferred to the updated Plan’s new strategies list. An explanation of the status is also provided.

Mitigation Action	Status	Explanation of Status
Culvert replacement/upgrade at Drewsville Road.	Continue	Funding needed. Include in Action Plan as a new action.
Install concrete bridge or concrete span on Hill Road for better flow of water. (top of Bell Hill)	Continue	In process of contractor selection.
Stabilize the streambank along Darby Brook near 179 Hill Road.	Continue	Funding needed. Include in Action Plan as a new action.
Stabilize the streambank along Warren Brook near 577 Forest Road.	Continue	Funding needed. Include in Action Plan as a new action.
Continue to educate public on importance of NFIP.	Completed and on-going	Include in Action Plan as a new action.
Continue ditching improvement program.	Completed and on-going	Include in Action Plan as a new action.
Continue to maintain the fire prevention program.	Completed and on-going	Include in Action Plan as a new action.
Install fire danger indicator sign.	Completed	Sign has been installed.
Include road design standards in land use documents.	Completed	Design standards are included.



Mitigation Action	Status	Explanation of Status
Recommend (to homeowner) relocation of house on Hill Road to avoid losing it in a landslide.	Completed and on-going	Include in Action Plan as a new action.
Recommend (to homeowner) relocation of house on Cook Hill Road to avoid losing it in a landslide.	Completed and on-going	Include in Action Plan as a new action.
Upgrade radio/communication system for Director of Public Works and Emergency Responders with better coverage and interoperability.	Continue	Some improvements have been made. Continue as a mitigation action.
Obtain an emergency back-up power unit at Cobb Hill cell tower and additional emergency back-up power units as needed.	Completed	Completed 2 years ago.
Continue to update Capital Improvement Program and include projects from this action plan.	Completed and on-going	Include in Action Plan as a new action.
River bank monitoring - regular monitoring to detect erosion.	Completed and on-going	Include in Action Plan as a new action.
Review the Dam Emergency Action Plans and maintain updates.	Completed and on-going	Emergency notifications have been upgraded.
Update the Master Plan to include this Hazard Mitigation Plan as a chapter or an appendix.	Continue	Include in Action Plan as a new action.
Regular monitoring of water flow/ practice emergency procedures from the Dam Action Plan.	Continue	Include in Action Plan as a new action.
Explore different methods of emergency notification (reverse 911, NOAA radios, etc.).	Continue	This is in process. Keep as a mitigation action.
Contact the NHDOT to coordinate bridge inspections with the local DPW to meet on-site.	Delete	NHDOT has not responded to this request.
Review the Floodplain Development Ordinance and update as needed.	Continue	Update when new model ordinance is released.
Update the Alstead Emergency Operations Plan.	Completed	Updated in 2020.
Install concrete bridge or concrete span on North Road for better flow of water. Pole # 8	Continue	Funding needed. Include in Action Plan as a new action.
Install concrete bridge or concrete span on North Road for better flow of water. Pole #11	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade at Cobb Hill Road. (1/2 mi. from NH 123)	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade near 438 Walpole Valley Road.	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade near 473 Walpole Valley Road.	Continue	Funding needed. Include in Action Plan as a new action.

Mitigation Action	Status	Explanation of Status
Culvert replacement/upgrade on Walpole Valley Road (near pole # 1/5 PSNH).	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade at Comstock Road (at Langdon town line).	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade at Hill Road. (Darby Brook farm).	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade at Homestead Road.	Completed	Project completed in 2022.
Culvert replacement/upgrade near 272 Thayer Brook Road.	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade on Thayer Brook Road (between Corbin Road and the Marlow town line).	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade on Thayer Brook Road near pole #79.	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade at Rhodes Road.	Continue	Funding needed. Include in Action Plan as a new action.
Culvert replacement/upgrade at various other locations as needed.	Continue	Funding needed. Include in Action Plan as a new action.
Install a larger gate at Vilas Pool Dam that could be hydraulically operated as needed.	Continue	Funding needed. Include in Action Plan as a new action.
Install concrete bridge or concrete span near 472 Southwoods Road for better flow of water.	Continue	Funding needed. Include in Action Plan as a new action.

# Chapter 7

## Existing & Potential Strategies

### Identifying Gaps in Coverage

The following programs and activities are aimed at mitigating the impacts of the identified potential hazards. As more information becomes available for other hazards that may have the potential to impact the Town of Alstead, additional strategies will be added to the Hazard Mitigation Plan Update 2023. The identified strategies are not only meant to address reducing the effects of hazards on existing buildings and infrastructure, but also to address reducing the effects of hazards on new buildings and infrastructure.

In addition to the programs and activities that Alstead is currently undertaking to protect its residents and property from natural, technological and human-caused disasters, a number of additional strategies were identified by the Local Hazard Mitigation Work Group for consideration. The process of compiling a comprehensive list of all mitigation strategies currently in place throughout the Town helped the Work Group identify gaps in the existing coverage and improvements which could be made to the existing strategies. New strategies were identified for each general hazard type using the following categories: Prevention (programs and policies), Property Protection, Emergency Services, Public Information.

### Potential Strategies

In addition to the mitigation strategies proposed generally for each hazard type as indicated above, the Work Group brainstormed actions for specific potential hazard areas identified. The section below shows proposed mitigation actions for both general hazard types and specific potential hazard areas. Each strategy was discussed to determine realistic strategies to be included in the STAPLEE chart.

**Potential Strategies Matrix**

Hazard Type	Prevention	Property Protection	Emergency Services	Public Information
Flooding	Perform a culvert inventory and assessment.	Upsize culverts/bridges on: Drewsville Rd., Hill Rd., Walpole Valley Rd., Comstock Rd., Homestead Rd., Thayer Brook Rd., Rhodes Rd., Southwoods Rd., and others.	Continue to participate in NFIP trainings/workshops offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	Improve public awareness of the NFIP.
	Dredge Vilas Pool to increase flood storage capacity.			
Drought	Maintain an updated list of addresses of the older residents and special needs populations.	Consider adding a water conservation regulation & water ban if necessary.	Consider locations for a water distribution center.	Provide information to residents on water conservation/ drought resistant landscaping and/or rain gardens.

Hazard Type	Prevention	Property Protection	Emergency Services	Public Information
Extreme Temperatures	Maintain an updated list of addresses of the older residents and special needs populations.	Update heating and cooling, insulation, windows, etc.	Update locations for emergency shelters.	Post links to the FEMA and NH HSEM website.
			Consider locations for heating, cooling and charging center.	
High Wind Events	Require tie-downs for structures (such as sheds).	Trim tree branches near critical facilities, town structures and roadways.	Update locations for emergency shelters.	Provide information for residents to understand ways to mitigate potential damage during a tornado/ severe wind/downbursts.
Infectious Disease	Develop a protocol for determining closures and measures needed to protect the public.	Equip the EOC and shelters with materials to handle a wide-spread infectious disease event.	Continue a strong relationship with the Regional Public Health Representative.	Conduct a public information workshop on emergency preparedness for short-term and long-term quarantine.
Lightning	Consider adding lightning arrestors to critical infrastructure.	Install grounding equipment on public & historic buildings.	Consider the need and locations for generators.	Include a link of the NH HSEM or FEMA website on the Town website.
Severe Winter Weather	Develop a written winter storms operations plan.	Coordinate with Eversource to trim tree branches near power lines.	Determine the need for additional portable and fixed generators.	Provide information to residents about proper use of generators and the importance of maintaining the heating system to prevent carbon monoxide poisoning and fires.
		Trim tree branches near critical facilities, town structures, and roadways.	Update the vulnerable populations list annually.	
Solar Storms and Space Weather	Become more aware and monitor high impact days.	Add EMP surge protection for town vehicles and equipment.	Consider alternative means of communication.	Add a link to the daily space weather report on the town website.
Tropical Storm and Hurricane	Coordinate with utility company to trim tree branches near power lines.	Consider requirement for new construction to withstand severe wind speeds.	Determine the need for additional portable and fixed generators.	Utilize the CODE RED emergency warning system.
				Continue to provide information to the public about NFIP.

Hazard Type	Prevention	Property Protection	Emergency Services	Public Information
Wild Fires	Continue to enforce the open burning laws.	Consider options to increase water resources such as cisterns and an increase in dry hydrant locations.	Continue training for firefighters.	Town-wide safety training: Fire prevention training at school; fire and health safety training open house; fire prevention outreach at Fire Dept.
Dams	Coordinate with State and Federal government to address the repetitive wash-out of NH 123A.	Inspect dams, bridges and culverts prior to heavy rain events.	Continue to work with mutual aid. Explore the staging of emergency services to strategic locations.	Provide information to residents about evacuation routes and emergency procedures.
Hazardous Materials	Training/materials needed for the fire department.	Provide information to residents & businesses about evacuation routes and procedures.	Continue mutual aid SWNHMA.	Provide outreach information on proper disposal of hazardous household materials and medicines.
Earthquakes		Retrofit public buildings with earthquake standards.		Provide information to the public about reducing damage due to earthquakes. Include a link of FEMA's website on the town website.
Erosion		Establish and implement BMPs and E&S Control Plans for construction and maintenance work throughout the Town.	Stabilize steep slopes with plantings, retaining walls, or rip rap.	
Landslide	Use best management practices.		Stabilize steep slopes with plantings, retaining walls, or rip rap.	
All Hazards	Continue Mutual Aid hazard drills.	Consider a Master Plan update and include this Plan in the appendix.	Update locations for emergency shelters.	Educate the public about the Shoreland Water Quality Protection Act.
	ICS/NIMS Training for Town departments.			Add an emergency management section or page to the town website

## Prioritization of Proposed Mitigation Strategies

The goal of each strategy identified in the previous list is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each strategy. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation strategies and discussed in the table:

- **Social:** Is the proposed strategy socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- **Technical:** Will the proposed strategy work? Will it create more problems than it solves?
- **Administrative:** Can the community implement the strategy? Is there someone to coordinate and lead the effort?
- **Political:** Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
- **Legal:** Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
- **Economic:** What are the costs and benefits of this strategy? Does the cost seem reasonable for the size of the problem and the likely benefits?
- **Environmental:** How will the strategy impact the environment? Will the strategy need environmental regulatory approvals?

Each mitigation strategy was evaluated and assigned a score (Good = 3, Average = 2, Poor = 1) based on the above criteria. An evaluation chart with total scores for each strategy can be found in the table below. Each strategy was evaluated and prioritized according to the final score. The highest scoring strategies were determined to be of most importance, economically, socially, environmentally, and politically.

STAPLEE CHART	Is it Socially acceptable?	Is it Technically feasible & potentially	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environ-mentally beneficial?	Total Score
Mitigation Strategy								
Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	3	3	3	3	3	3	3	21
Update the Town website to improve public awareness of NFIP. Include preparedness and mitigation methods for residents to reduce the impact of all natural disasters.	3	3	3	3	3	3	3	21
Culvert replacement/upgrade at Drewsville Road.	3	3	3	3	3	3	3	21
Install concrete bridge or concrete span on Hill Road for better flow of water. (top of Bell Hill)	3	3	3	3	3	3	3	21
Stabilize the streambank along Warren Brook near 577 Forest Road.	3	3	3	3	3	3	3	21
Continue ditching improvement program.	3	3	3	3	3	3	3	21

STAPLEE CHART Mitigation Strategy	Is it Socially acceptable?	Is it Technically feasible & potentially successful?	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environ-mentally beneficial?	Total Score
Continue to maintain the fire prevention program.	3	3	3	3	3	3	3	21
Continue to advise homeowners on Hill Road and Cook Hill Road of potential risks of a landslide.	3	3	3	3	3	3	3	21
Upgrade radio/communication system for Director of Public Works and emergency responders with better coverage and interoperability.	3	3	3	3	3	3	3	21
Continue to update Capital Improvement Program and include projects from this action plan.	3	3	3	3	3	3	3	21
River bank monitoring - regular monitoring to detect erosion.	3	3	3	3	3	3	3	21
Review the Dam Emergency Action Plans and maintain updates.	3	3	3	3	3	3	3	21
Update the Master Plan to include this Hazard Mitigation Plan as a chapter, appendix or by reference.	3	3	3	3	3	3	3	21
Regular monitoring of water flow/ practice emergency procedures from the Dam Action Plan.	3	3	3	3	3	3	3	21
Explore different methods of emergency notification (reverse 911, NOAA radios, etc.).	3	3	3	3	3	3	3	21
Review the Floodplain Development Ordinance and update as needed.	3	3	3	3	3	3	3	21
Install concrete bridge or concrete span on North Road for better flow of water. Pole # 8	3	3	3	3	3	3	3	21
Install concrete bridge or concrete span on North Road for better flow of water. Pole #11	3	3	3	3	3	3	3	21
Culvert replacement/upgrade at Cobb Hill Road. (1/2 mi. from NH 123)	3	3	3	3	3	3	3	21
Culvert replacement/upgrade near 438 Walpole Valley Road.	3	3	3	3	3	3	3	21
Culvert replacement/upgrade near 473 Walpole Valley Road.	3	3	3	3	3	3	3	21
Culvert replacement/upgrade on Walpole Valley Road (near pole # 1/5 PSNH).	3	3	3	3	3	3	3	21
Culvert replacement/upgrade at Comstock Road (at Langdon town line).	3	3	3	3	3	3	3	21
Culvert replacement/upgrade at Hill Road. (Darby Brook farm).	3	3	3	3	3	3	3	21
Culvert replacement/upgrade near 272 Thayer Brook Road.	3	3	3	3	3	3	3	21

STAPLEE CHART Mitigation Strategy	Is it Socially acceptable?	Is it Technically feasible & potentially successful?	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environ-mentally beneficial?	Total Score
Culvert replacement/upgrade on Thayer Brook Road (between Corbin Road and the Marlow town line).	3	3	3	3	3	3	3	21
Culvert replacement/upgrade on Thayer Brook Road near pole #79.	3	3	3	3	3	3	3	21
Culvert replacement/upgrade at Rhodes Road.	3	3	3	3	3	3	3	21
Culvert replacement/upgrade at various other locations as needed.	3	3	3	3	3	3	3	21
Install a larger gate at Vilas Pool Dam that could be hydraulically operated as needed.	3	3	3	3	3	3	3	21
Install concrete bridge or concrete span near 472 Southwoods Road for better flow of water.	3	3	3	3	3	3	3	21
Install a generator at the school.	3	3	3	3	3	3	3	21
Consider options to increase water resources such as cisterns and additional dry hydrant locations.	3	3	3	3	3	3	3	21
Investigate hiring a part-time fire inspector.	3	3	3	3	3	3	3	21
Update the Emergency Operations Plan in 2024. Prepare an application for funding in winter of 2023.	3	3	3	3	3	3	3	21
Coordinate with State and Federal Government to address the repetitive washout of NH 123A.	3	3	3	3	3	3	3	21
Explore the staging of emergency services to strategic locations for potential dam breaches/failures.	3	3	3	3	3	3	3	21
Provide a link to the daily space weather report on the Town website.	3	3	3	3	3	3	3	21
Equip the Emergency Operations Center and shelters with materials to handle a wide-spread infectious disease event.	3	3	3	3	3	3	3	21
Consider locations for a heating, cooling and charging center.	3	3	3	3	3	3	3	21
Dredge Vilas Pool to increase flood storage capacity.	3	3	3	3	3	3	3	21
Install EMP surge protectors in town vehicles and equipment.	3	3	3	3	3	3	3	21
Determine an engineering firm for the Vilas Dam spillway.	3	3	3	3	3	3	3	21
Improve road design standards.	3	3	3	3	3	3	3	21
Stabilize the streambank along Darby Brook near 179 Hill Road.	2	3	2	1	1	3	3	15



# Chapter 8 Implementation Schedule

## Action Plan

The Alstead Hazard Mitigation Work Group developed an action plan that outlines who is responsible for implementing each of the prioritized strategies determined in the previous chapters, as well as when and how the actions will be implemented. The following questions were asked to develop an implementation schedule for the identified priority mitigation strategies:

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

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

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

A fourth consideration was the cost/benefit of each proposed action. Comments regarding the cost/benefit of each project are included, along with the “who,” “when,” and “how” in the table below.

Mitigation Actions that were identified in Chapter 7 but did not score as a priority, will remain in the plan. As additional funding and staff becomes available, these strategies should be considered in future plan updates.

Once the plan is formally approved by FEMA, the Town will begin working on the actions listed below with an estimated completion date as noted in the Timeframe (When) column. Also, as additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the plan will be reviewed and amended accordingly

Acronyms used in the Leadership column:

AA - Administrative Assistant

SB - Select Board

DOT - NH Department of Transportation

EMD - Emergency Management Director

EMS - Emergency Medical Services

FC - Fire Chief

PB - Planning Board

RA - Road Agent

### Implementation/Action Plan

Mitigation Action	Leadership (Who)	When	How
Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	EMD	Short-term	Grants/Town budget
Update the Town website to improve public awareness of NFIP. Include preparedness and mitigation methods for residents to reduce the impact of all natural disasters.	AA	Mid-term	Town budget
Culvert replacement/upgrade at Drewsville Road.	RA, SB	Short-term	Grants/Town budget

Mitigation Action	Leadership (Who)	When	How
Install concrete bridge or concrete span on Hill Road for better flow of water. (top of Bell Hill)	RA, SB	Short-term	Grants/Town budget
Stabilize the streambank along Warren Brook near 577 Forest Road.	RA, DOT	Long-term	Grants/Town budget
Continue ditching improvement program.	RA	Short-term	Town budget
Continue to maintain the fire prevention program.	FC	Short-term	Town budget
Continue to advise homeowners on Hill Road and Cook Hill Road of potential risks of a landslide.	SB	Long-term	Town budget
Upgrade radio/communication system for Director of Public Works and emergency responders with better coverage and interoperability.	SB	Short-term	Grants/Town budget
Continue to update Capital Improvement Program and include projects from this action plan.	SB	Short-term	Town budget
River bank monitoring - regular monitoring to detect erosion.	RA	Short-term	Town budget
Review the Dam Emergency Action Plans and maintain updates.	EMD	Long-term	Town budget
Update the Master Plan to include this Hazard Mitigation Plan as a chapter, appendix or by reference.	PB	Long-term	Town budget
Regular monitoring of water flow/ practice emergency procedures from the Dam Action Plan.	RA, EMD, FC	Short-term	Town budget
Explore different methods of emergency notification (reverse 911, NOAA radios, etc.).	EMD	Short-term	Town budget
Review the Floodplain Development Ordinance and update as needed.	PB	Long-term	Grants/Town budget
Install concrete bridge or concrete span on North Road for better flow of water. Pole # 8	RA	Long-term	Grants/Town budget
Install concrete bridge or concrete span on North Road for better flow of water. Pole #11	RA	Long-term	Grants/Town budget
Culvert replacement/upgrade at Cobb Hill Road. (1/2 mi. from NH 123)	RA	Long-term	Grants/Town budget
Culvert replacement/upgrade near 438 Walpole Valley Road.	RA	Short-term	Grants/Town budget
Culvert replacement/upgrade near 473 Walpole Valley Road.	RA	Short-term	Grants/Town budget
Culvert replacement/upgrade on Walpole Valley Road (near pole # 1/5 PSNH).	RA	Short-term	Grants/Town budget
Culvert replacement/upgrade at Comstock Road (at Langdon town line).	RA	Short-term	Grants/Town budget
Culvert replacement/upgrade at Hill Road. (Darby Brook farm).	RA	Long-term	Grants/Town budget

Mitigation Action	Leadership (Who)	When	How
Culvert replacement/upgrade near 272 Thayer Brook Road.	RA	Long-term	Grants/Town budget
Culvert replacement/upgrade on Thayer Brook Road (between Corbin Road and the Marlow town line).	RA	Long-term	Grants/Town budget
Culvert replacement/upgrade on Thayer Brook Road near pole #79.	RA	Long-term	Grants/Town budget
Culvert replacement/upgrade at Rhodes Road.	RA	Long-term	Grants/Town budget
Culvert replacement/upgrade at various other locations as needed.	RA	Long-term	Grants/Town budget
Install a larger gate at Vilas Pool Dam that could be hydraulically operated as needed.	BOS	Long-term	Grants/Town budget
Install concrete bridge or concrete span near 472 Southwoods Road for better flow of water.	RA	Long-term	Grants/Town budget
Install a generator at the school.	EMD	Mid-term	Grants/Town budget
Consider options to increase water resources such as cisterns and additional dry hydrant locations.	FC	Mid-term	Grants/Town budget
Investigate hiring a part-time fire inspector.	EMD, FC		Grants/Town budget
Update the Emergency Operations Plan in 2024. Prepare an application for funding in winter of 2023.	EMD	Short-term	Grants
Coordinate with State and Federal Government to address the repetitive washout of NH 123A.	SB	Short-term	Grants/Town budget
Explore the staging of emergency services to strategic locations for potential dam breaches/failures.	EMD	Short-term	Grants/Town budget
Provide a link to the daily space weather report on the Town website.	AA	Short-term	Town budget
Equip the Emergency Operations Center and shelters with materials to handle a wide-spread infectious disease event.	EMD, EMS	Short-term	Grants/Town budget
Consider locations for a heating, cooling and charging center.	EMD	Short-term	Grants
Dredge Vilas Pool to increase flood storage capacity.	SB	Long-term	Grants/Town budget
Install EMP surge protectors in town vehicles and equipment.	EMS	Long-term	Grants/Town budget
Determine an engineering firm for the Vilas Dam spillway.	SB	Short-term	Grants/Town budget
Improve road design standards.	RA, PB	Short-term	Town budget
Stabilize the streambank along Darby Brook near 179 Hill Road.	RA, SB	Mid-term	Grants/Town budget

## Chapter 9

# Adoption, Implementation, Monitoring, and Updates

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### Plan Management

The Alstead Select Board adopted the Alstead Hazard Mitigation Plan Update 2023 on (add BOS adoption date). A copy of the resolution can be found at the end of this chapter. Adopted policy addresses the actions for implementation set forth in the chart “Implementation Strategy for Priority Mitigation Actions” in Chapter 8 and in the “Monitoring & Updates” sub-section contained in this chapter. All other sections of this Plan are supporting documentation for information purposes only and are not included as the statement of policy.

A copy of the public hearing notice for the Select Board meeting at which the plan was adopted is included in **Appendix E**. The plan was available to the public via a hard copy at the Town offices prior to the Select Board meeting. Any comments were considered and addressed prior to adoption of the plan.

### Monitoring & Updates

Recognizing that many mitigation projects are ongoing, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the Plan where necessary.

In order to track progress and update the Mitigation Strategies identified in the Action Plan (Chapter 8), the Hazard Mitigation Work Group will revisit the Alstead Hazard Mitigation Plan Update 2023 annually, or after a hazard event. The Emergency Management Director is responsible for initiating this review and should consult with the Select Board and other key local officials. Changes should be made to the Plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with the timeframe, the community’s priorities and funding resources. Priorities that did not make the implementation list, but are identified as potential mitigation strategies, should also be reviewed during the monitoring and update of this Plan to determine feasibility of future implementation. In keeping with the process of adopting the Alstead Hazard Mitigation Plan Update 2023, a public hearing to receive public comment on plan maintenance and updating will be held during the annual review period and the final product adopted by the Select Board.

Monitoring of the Plan shall include periodic reports, meetings, site visits, and phone calls. The projects identified in this Plan will be evaluated to make sure they are still applicable and practical. When the Plan is evaluated, any changes should be incorporated into the Plan in the annual update.

**Appendix F** is meant to assist in the monitoring and evaluation of the Plan on an ongoing basis.

The Town of Alstead, NH Hazard Mitigation Plan Update 2023 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval every five years in order to maintain eligibility for Hazard Mitigation & Assistance Grants (HMA Grants).

This plan received NH HSEM/FEMA final approval on (add approval date).

### Implementation of the Plan Through Existing Programs

In addition to work by the Hazard Mitigation Work Group and Town departments, several other mechanisms exist which will ensure that the Alstead Hazard Mitigation Plan receives the attention it requires for satisfactory use.

### Capital Improvements Program

Many of the projects found within the Action Plan of this update are incorporated into the Capital Improvements Plan. It is there that the funding of the projects will be reviewed and determined to be included in future budget considerations by the Town.

### Master Plan

The Local Hazard Mitigation Work Group will oversee the process to begin working with the Planning Board to encourage that the Alstead Hazard Mitigation Plan Update 2023 is adopted as a chapter or appendix in the Master Plan.

### Zoning Ordinance and Regulations

Some of the implementation strategies proposed involve revisions to the Subdivision Regulations and/or the Site Plan Review Regulations as well as the Zoning Ordinance. The Local Hazard Mitigation Work Group will oversee the process to begin working with the Planning Board to develop appropriate language for the recommended modifications.

## Continued Public Involvement

On behalf of the Hazard Mitigation Work Group, the Emergency Management Director (EMD), under direction of the Select Board, will be responsible for ensuring that town departments and the public have adequate opportunity to participate in the planning process. Administrative staff may be utilized to assist with the public involvement process. For the yearly update process, techniques that will be utilized for public involvement may include:

- Provide personal invitations to Budget Committee members;
- Provide personal invitations to town department heads;
- Post notices of meetings at the Town Office and Library;
- Information added to the Town website.

A number of Implementation Action items which will be undertaken relate to public education and involvement. Additionally, members of the public including area business owners, schools, communities, and organizations will be invited to participate in the yearly process of updating the Alstead Hazard Mitigation Plan Update 2023. These outreach activities will be undertaken during the Plan's annual review and during any Hazard Mitigation Work Group meetings the Select Board calls to order. For all meetings regarding the Alstead Hazard Mitigation Plan Update 2023, the public will be noticed and the meetings will be open to the public.

**CERTIFICATE OF ADOPTION**  
**ALSTEAD, NEW HAMPSHIRE**  
**SELECT BOARD**  
**A RESOLUTION ADOPTING THE**  
**ALSTEAD HAZARD MITIGATION PLAN UPDATE 2023**

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

WHEREAS, Work Group meetings were held between November 3, 2022 and March 2, 2023 regarding the development and review of the Alstead Hazard Mitigation Plan Update 2023; and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Alstead, 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 Alstead 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 Alstead;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of the Town of Alstead this \_\_\_\_ day of \_\_\_\_\_, **2023**

\_\_\_\_\_  
Alstead Select Board Chairman

\_\_\_\_\_  
Select Board

\_\_\_\_\_  
Select Board

ATTEST \_\_\_\_\_

# Appendices

# Appendix A: Hazard Descriptions



## Natural Hazards

**Inland Flooding:** Inland flooding is generally defined as a high flow, overflow, or inundation by water, which causes or threatens damage. Flooding results from the overflow of rivers, their tributaries and streams primarily from high precipitation events. Flash flooding is defined as a flow with a rapid rise in water level and extreme velocities in a river or stream, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. Because of New Hampshire's steep terrain in the headwaters of watersheds, particularly outside of the coastal plain, flash floods also lead to river bank and bed erosion. Extreme precipitation events in recent years, such as Tropical Storm Irene, have led to buildings on the edges of streambanks becoming at risk to river erosion, or culvert failures. The National Flood Insurance Program (NFIP) has a more specific definition of flooding, which can also be considered and used when looking at floodplain and floodplain mapping.

A flood is defined by the NFIP as:

- A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more properties (at least 1 of which is the policyholder's property) from:
  - o Overflow of inland or tidal waters
  - o Unusual and rapid accumulation or runoff of surface waters from any source
  - o Mudflow
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term 100-year flood does not mean that flood will occur once every 100 years. It is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase "1% annual chance flood". What this means is that there is a 1% chance of a flood of that size happening in any year.

Areas that have been identified as part of the 1% annual chance floodplain in support of the NFIP simply represent those areas for which mapping has been performed. With sufficient rainfall, snowmelt, or through the result of ice jam formation or in the event of dam failure, all areas that are floodplain adjacent to rivers and streams are prone to flood inundation. Developed areas are susceptible to poor drainage flooding during episodes of heavy rain that falls within a short duration. Such flooding is the result of the concentration of impervious surfaces where the amount of concrete, asphalt, rooftops, and other minimally or non-porous materials concentrates flow to stormwater systems that, during heavy rain, cannot always handle the input, causing flooding conditions on streets and parking lots.

**Drought:** A drought is basically the absence of water in an area that occurs slowly due to below-average precipitation over an extended period, resulting in low stream flows, low surface water, and low groundwater levels. Mitigation for drought is difficult, however, preparedness can help to reduce the impacts that a drought can have. During a drought, water stored in aquifers and surface reservoirs becomes increasingly important to offset the lack of rain, especially in areas of high agricultural production. Conservation of water usage prior to, and during a drought can help reduce the potential water shortages that often occur during a drought.

**Earthquakes:** The United States Geological Survey (USGS) defines an earthquake as a sudden slip on a fault. Tectonic plates are always slowly moving, but can get stuck on edges due to friction. When the stress on the plates overcomes the friction, there is an earthquake that releases an energy wave that travels through the earth's crust. The earthquake hazard is anything associated with an earthquake that may affect the

normal activities of people; such as, surface faulting, ground shaking, landslides, tsunamis, structural damage, etc. There are two primary ways in which earthquakes are measured, magnitude (the size of the earthquake) and intensity (measure of the shaking and damage, which can vary from location to location). Magnitude is measured in the Moment Magnitude scale (based off the obsolete Richter scale). The Modified Mercalli Intensity (MMI) classifies the perceived feeling of the earthquake.

**Extreme Temperatures:** Extreme temperatures are a period of prolonged and/or excessive hot or cold that presents a danger to human health and life.

**Extreme Heat** is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. These event conditions are typically infrequent. When they do occur, however, they are usually in late July and August. The severity of extreme heat can be dangerous to those residents with medical conditions and the older population. It is important to have cooling areas and a good supply of water available. Extreme heat can add to the potential for wildfires and depletion of the water supply for firefighting. Extreme heat can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

The National Weather Service (NWS) provides the following definitions (northeast ranges):

- **Heat Advisory:** Two or more consecutive hours of Heat Index values of 95-99 degrees Fahrenheit for two or more days OR any duration of Heat Index values of 100-104 degrees Fahrenheit. A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions.
- **Excessive Heat Warning:** Two or more hours with Heat Index values of 105 degrees Fahrenheit or greater. An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions.
- **Excessive Heat Watches:** Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.
- **Excessive Heat Outlooks:** Issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.

**Extreme Cold** events occur during meteorological cold waves, also known as cold snaps that are caused by the southern transport of arctic airmasses into the Northeast. These events are most common in winter months and increase the likelihood of cold disorders in humans and animals that have prolonged exposure to low ambient temperatures. Cold disorders can include frostbite and hypothermia which can eventually lead to death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

The National Weather Service provides the following definitions (northeast ranges):

- **Wind Chill Watch:** NWS issues a wind chill watch when dangerously cold wind chill values are possible. As with a warning, adjust your plans to avoid being outside during the coldest parts of the day. Make sure your car has at least a half a tank of gas, and update your winter survival kit.
- **Wind Chill Advisory:** NWS issues a wind chill advisory when seasonably cold wind chill values but not extremely cold values are expected or occurring. Be sure you and your loved ones' dress appropriately and cover exposed skin when venturing outdoors. A Wind Chill Advisory is issued for New Hampshire if wind chill values are expected to be -20°F to -29°F and winds are greater than 5 mph.
- **Wind Chill Warning:** NWS issues a wind chill warning when dangerously cold wind chill values are expected or occurring. A Wind Chill Advisory is issued for New Hampshire if wind chill values are expected to be -30°F and winds are greater than 5 mph.

- **Freeze Watch:** NWS issues a freeze watch when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours. A freeze watch is issued in the autumn until the end of the growing season and in the spring at the start of the growing season.
- **Frost Advisory:** A frost advisory means areas of frost are expected or occurring, posing a threat to sensitive vegetation.
- **Freeze Warning:** When temperatures are forecasted to go below 32°F for a long period of time, NWS issues a freeze warning. This temperature threshold kills some types of commercial crops and residential plants.
- **Hard Freeze Warning:** NWS issues a hard freeze warning when temperatures are expected to drop below 28°F for an extended period of time, killing most types of commercial crops and residential plants.

**High Wind Events:** The State of New Hampshire experiences two types of high wind events that may result from other severe storms and may occur at any time of the year:

**Tornadoes:** A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.

**Straight-line winds:** This term describes any thunderstorm wind that is not associated with rotation, and is usually used to differentiate from tornadic winds. There are several sub-types of straight-line winds:

- **Downdraft** - small-scale column of air that rapidly sinks towards the ground.
- **Downburst** - result of a downdraft, referred to as a macroburst when the area affected is greater than 2.5 miles and microburst when less than 2.5 miles.
- **Gust Front** - leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Characterized by wind shift, temperature drop and gusty winds in front of a thunderstorm.
- **Derecho** - widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. A typical derecho consists of numerous microbursts, downbursts and downburst clusters. By definition, if the wind damage swath extends more than 240 miles and includes wind gusts of at least 58 mph or greater along most of its length, then the event may be classified as a derecho.

**Infectious Disease/Pandemic:** Infectious diseases are illnesses 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. Signs and symptoms vary depending on the organism causing the infection, but often include fever and fatigue. Mild infections get better on their own without treatment, while some are life-threatening infections and may require hospitalization. Wide-spread infectious diseases may cause mass causality regionally and world-wide.

**Landslide:** A landslide is the downward or outward movement of earth materials on a slope that is reacting to a combination of the force of gravity and a predisposed weakness in the material that allows the sliding process to initiate. The broad classification of landslides includes mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides, and earth flows. Landslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of

soil or rock. Although gravity becomes the primary reason for a landslide once a slope has become weak through a process such as the one just described, other causes can include:

- Erosion by rivers or the ocean that creates over-steepened slopes through erosion of the slope's base. In the case of rivers, this can occur as a result of flash flooding.
- Rock and soil slopes are weakened through saturation by snowmelt or heavy rains.
- Wildfires (loss of vegetation).
- Excess weight from accumulation of rain or snow, stockpiling of rock or ore and other material.

**Lightning:** Lightning is a visible electric discharge produced by a thunderstorm. Thunder always accompanies lightning, but may or may not be heard depending on the position of the observer. As lightning passes through the air, it heats the air to a temperature of 18,000-60,000 degrees Fahrenheit. This causes the air to rapidly expand and contract creating a sound wave known as thunder. Thunder can be heard up to 10 miles away from the strike. At longer distances thunder sounds like a low rumble as the higher frequency sounds are absorbed by the environment.

**Severe Winter Weather:** The State of New Hampshire experiences four types of severe weather during the winter months, which usually bring snow, high winds and/or rain depending on temperatures.

Heavy snow - Heavy snow is generally defined as:

- Snowfall accumulating to 4" or more in depth in 12 hours or less; or
- Snowfall accumulating to 6" or more in depth in 24 hours or less.

Blizzard - A blizzard is a snowstorm with the following conditions that is expected to prevail for a period of 3 hours or longer:

- Sustained wind or frequent gusts to 35mph or greater and considerable falling and/or blowing snow that frequently reduces visibility to less than ¼ mile.

Nor'easter - A Nor'easter is a large cyclonic storm that tracks north/northeastward along the East Coast of North America. It is so named due to the northeasterly prevailing wind direction that occurs during the storm. While these storms may occur at any time of the year, they are most frequent and severe during the months of September through April. Nor'easters usually develop off the east coast between Georgia and New Jersey, travel northeastward, and intensify in the New England region. Nor'easters nearly always bring precipitation in the form of heavy rain and/or snow, as well as gale force winds, rough seas, and coastal flooding.

Ice Storm - Ice storms typically occur with warm frontal boundaries, where warm air rises up and over a shallow mass of cold air near the earth's surface. When snow falls from clouds near just north of the warm frontal boundary, it will fall through the deep warm layer aloft first and melt completely into a liquid water droplet. As it passes through the shallow cold layer near the surface, the water droplet cools to the point of being supercooled (a liquid raindrop that remains a liquid at the freezing point). When these supercooled water droplets make contact with freezing surfaces on the ground, such as streets and walkways, they freeze on contact forming layers of ice. This process of freezing rain, when persistent over a long period of time, will form layers that may exceed over an inch thick in extreme cases. Any accumulation of ice can present hazards; however, significant accumulations of ice (1/4" or greater) can pull down trees and utility lines resulting in loss of power and communications. Walking and driving also becomes very dangerous to almost impossible during an ice storm.

**Solar Storms and Space Weather:** The term space weather is relatively new and describes the dynamic conditions in the Earth's outer space environment, similar to how the terms "climate" and "weather" refer to the conditions in the Earth's lower atmosphere. Space weather includes any and all conditions and events

on the sun, in the solar wind, in near-Earth space, and in our upper atmosphere that can affect space-borne and ground based technological systems.

The entire State of New Hampshire is at risk for solar storms and space weather. Space weather affects Earth due to the sun sending energy across the Earth in the form of light and electrically charged particles and magnetic fields. Although space weather has occurred since the beginning of time, little was understood about the causes and impacts of these instances on the planet. As society becomes increasingly reliant on electronics and technology, the hazards presented by space weather are not to be underestimated. The magnetic disturbances that solar storms can bring can disrupt communications, damage or destroy electronic components, corrode gas and oil pipelines, and cause significant damage to spacecraft and satellites. Radio operators have long been aware of the effects of space weather and how it impacts radio communications, especially those in the High Frequency (HF) band (3-30MHz). Depending on atmospheric conditions from space weather, radio signals can be partially or completely blocked.

**Hurricane and Tropical Storm:** A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and may extend over 400 miles. High winds and flooding are primary causes of hurricane-inflicted loss of life and property damage. Tropical Storms are typically storms that have been downgraded from a hurricane as it reaches further inland. These storms often have large amounts of rain and severe wind, but wind speeds do not reach the level to be classified as a hurricane.

**Wildfire:** A wildfire is any non-structural fire, other than prescribed fire, that occurs in the Wildland. Wildland here is defined as consisting of vegetation or natural fuels. Wildfires can be referred to as brushfires, wildland fires, or grass fires depending on the location and what is burning.

## Technological Hazards

**Aging Infrastructure:** The continued regression of the States'/towns' physical systems including, but not limited to roads and bridges, culverts, utilities, water, and sewage.

**Conflagration:** A large and destructive fire that threatens human life, animal life, health, and/or property. It may also be described as a blaze or simply a (large) fire. A conflagration can begin accidentally, be naturally caused (wildfire), or intentionally created (arson). Conflagrations have the potential to cause loss of life, property devastation/destruction and potential negative economic impacts.

**Dam Failure:** Dam failure is defined as the sudden, rapid, and uncontrolled release of impounded water.

**Known & Emerging Contaminants:** Contaminants in drinking water include naturally occurring contaminants associated with the geology in a given region and known man-made contaminants associated with nearby land use activities. Some contaminants are considered emerging contaminants.

Man-made Contaminants - Man-made chemicals that have been historically recognized to impact some groundwater and surface water sources of drinking water include volatile organic compounds, pesticides, semi-volatile compounds, radionuclides, nitrates/nitrites, metals, and radionuclides.

Emerging Contaminants - Emerging contaminants are chemicals that historically have not been monitored in drinking water due to the lack of laboratory capabilities to detect the compounds or a lack of knowledge about the use of certain compounds and their potential to cause human health impacts. Emerging contaminants have been detected in surface and groundwater that are sources of drinking water in the State of New Hampshire. The latest incidents in New Hampshire to garner widespread media and public attention were related to the discovery of poly and perfluoroalkyl substances, more commonly referred to as PFAS. Historically, other emerging contaminants have spiked public concern, including Methyl Tertiary Butyl Ether (MtBE), which is a manufactured chemical used to increase the octane rating of gasoline. MtBE degrades slowly and is highly soluble in water, allowing it to spread further and last longer in groundwater than many other contaminants.

**Hazardous Materials:** A hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials spills or releases can cause damage or loss to life and property. Short or long-term evacuation of local residents and businesses may be required, depending on the nature and extent of the incident.

**Long-term Utility Outage:** A long-term utility outage is defined as a prolonged absence of any type of public utility that is caused by infrastructure failure, cyber-attack, supply depletion, distribution disruption, water source contamination, or a natural, human-caused or technological disaster. This plan considers a long-term utility outage as one lasting two weeks more, or a prolonged outage that causes extreme cascading impacts.

**Radiological:** Radiological hazards can range from relatively localized incidents involving small amounts of radioactive materials to large-scale catastrophic events. Smaller sources of radiation hazards may be found in medical facilities, industrial and laboratory facilities where radioactive materials and/or radiation producing devices are used. Some radiation is produced naturally from decomposition of radioactive isotopes in soils and underlying strata.

## **Human-Caused Hazards**

**Cyber Event:** The Department of Homeland Security (DHS) defines a cyber incident as an event occurring on or conducted through a computer network that actually or imminently jeopardizes the confidentiality, integrity, or availability of computers, information or communications systems or networks, physical or virtual infrastructure controlled by computers or information systems.

**Mass Casualty Incident:** Any large number of casualties (sick, injured, or dead) produced in a relatively short period of time, usually as the result of a single incident such as a military aircraft accident, hurricane, flood, earthquake, or armed attack that exceeds local logistic support capabilities.

**Terrorism/Violence:** Premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents.

**Transport Accident:** A transport accident is any accident that occurs during transportation that has multiple injuries or deaths, or has significant impact to the roadways and surrounding area. Specifically, for this plan, it refers to an aviation, tractor trailer, or vehicle accident.

# Appendix B: Risk Assessment

## Risk Assessment

The Hazard Mitigation Working Group met to discuss the towns' risk assessment and assign rating scores. Consideration was given to climate change, current capabilities, town assets and critical infrastructure, and previous occurrences when determining the scale of impacts and overall risk. The following terms were used to analyze the hazards:

**Impacts:** The **Impact** is an estimate generally based on a hazard's effects on humans, property and businesses. The Working Group determined the impact rating for each of the previously identified hazards. The average impact score was calculated by computing the average of the human, property and business impact scores. The impact ratings were broken down into the following categories:

### Impact Scoring

- 1 - Inconvenience, reduced service/productivity, minor damages, non-life-threatening injuries.
- 3 - Moderate to major damages, temporary closure and reduced service/productivity, numerous injuries and deaths.
- 6 - Devastation and significant injuries and deaths, permanent closure and/or relocation of services, long-term effects.

**Probability of Occurrence:** The Probability of Occurrence is a numeric value that represents the likelihood that the given hazard will occur within the next 10 years. This value was chosen based on historical information. The Working Group determined the probability of occurrence rating for each of the previously identified hazards. The probability of occurrence ratings was broken into the following categories:

Low: There is little likelihood that this event will occur within the next 10 years (1 event in 10 years).

Medium: There is moderate likelihood that this event will occur within the next 10 years (1-2 events each 5-10 years).

High: There is great likelihood that this event will occur within the next 10 years (1-2 events each year).

### Probability Scoring

- 1 - 33% probability of occurring within 10 years (Low)
- 3 - 34-66% probability of occurring within 10 years (Medium)
- 6 - 67-100% probability of occurring within 10 years (High)

**Severity** - Severity is calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

**Risk** - Risk is an adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 10 years. It is calculated by multiplying the probability of occurrence and severity.

Low: There is little potential for a disaster during the next 10 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard does not need to be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

Medium: There is moderate potential for a disaster of less than major proportions during the next 10 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate



against this hazard. This hazard should be included in the town's emergency management training and exercise program.

**High:** Risks that are considered to be high were likely ranked so due to (1) a strong potential for a disaster of major proportions during the next 10 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 10 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the towns' emergency management training and exercise program.

**Overall Risk:** The **Overall Risk** is a representation of the combined potential impact and probability of occurrence ratings. This is calculated by multiplying the probability of occurrence rating score by the impact rating score (the average of human, property and business impacts). The goal of identifying the overall risk of each identified hazard is to assist the town in determining which hazards pose the largest potential threat. The overall risk ratings are broken down and color coded into the following categories:

White: values 1 - 9, Low Risk

Yellow: values 10 - 19, Medium Risk

Red: values 20 +, High Risk

# Appendix C: Resources

## Resources Used in the Preparation of this Plan

NH HSEM’s State of New Hampshire Natural Hazards Mitigation Plan (2018)  
 FEMA’s Understanding Your Risks: Identifying Hazards and Estimating Losses  
 Local Mitigation Planning Handbook  
 Town of Alstead, NH’s Hazard Mitigation Plan Update 2017

### Agencies

#### **New Hampshire Homeland Security and Emergency Management (NH HSEM)**

Field Representative Cheshire County: Jill Piwoski.....603-223-3613  
 Mitigation Officer: Natasha Cole .....603-223-4243  
 Mitigation Planner: Lynne Doyle .....603-227-8780  
**Federal Emergency Management Agency (FEMA)**.....877-336-2734

#### **NH Regional Planning Commissions:**

Central NH Regional Planning Commission .....603-226-6020  
 Lakes Region Planning Commission .....603-279-8171  
 Nashua Regional Planning Commission .....603-883-0366  
 North Country Council .....603-444-6303  
 Rockingham Planning Commission .....603-778-0885  
 Southern New Hampshire Planning Commission .....603-669-4664  
 Southwest Region Planning Commission .....603-357-0557  
 Strafford Regional Planning Commission .....603-742-2523  
 Upper Valley Lake Sunapee Regional Planning Commission .....603-448-1680

#### **NH Executive Department:**

Governor’s Office of Energy and Community Services .....603-271-2611

#### **NH Department of Cultural Resources:** .....603-271-2540

Division of Historical Resources .....603-271-3483

#### **NH Department of Environmental Services (NHDES):**.....603-271-3503

Air Resources .....603-271-1370  
 Air Toxins Control Program.....603-271-0901  
 Asbestos Program .....603-271-1373  
 Childhood Lead Poisoning Prevention Program.....603-271-5733  
 Environmental Health Tracking Program.....603-271-4072  
 Environmental Toxicology Program .....603-271-3994  
 Health Risk Assessment Program.....603-271-6909  
 Indoor Air Quality Program.....603-271-3911  
 Occupational Health and Safety Program.....603-271-2024  
 Radon Program .....603-271-4764  
 Geology Unit .....603-271-3503  
 Pollution Preventive Program.....603-271-6460  
 Waste Management .....603-271-2900  
 Water Supply and Pollution Control .....603-271-3414  
 Rivers Management and Protection Program .....603-271-8801

#### **NH Office of Planning and Development (OPD)**.....603-271-2155

#### **NH Municipal Association (NHMA)** .....603-224-7447

#### **NH Fish and Game Department** .....603-271-3421

Region 1, Lancaster.....	603-788-3164
Region 2, New Hampton.....	603-744-5470
Region 3, Durham .....	603-868-1095
Region 4, Keene.....	603-352-9669
<b>NH Department of Business and Economic Affairs (NHDBEA):</b> .....	603-271-2411
Economic Development.....	603-271-2629
Travel and Tourism.....	603-271-6870
<b>NH Department of Natural and Cultural Resources (NHDNCR):</b> .....	603-271-2411
Division of Forests and Lands .....	603-271-2214
Division of Parks and Recreation .....	603-271-3556
Design, Development, and Maintenance .....	603-271-2411
<b>NH Department of Transportation (NHDOT)</b> .....	603-271-3734
<b>Northeast States Emergency Consortium, Inc. (NESEC)</b> .....	781 224-9876
<b>US Department of Commerce:</b> .....	202-482-2000
NOAA: National Weather Service; Taunton, Massachusetts .....	508-824-5116
<b>US Department of the Interior:</b> .....	202-208-3100
US Fish and Wildlife Service .....	603-225-1411
US Geological Survey .....	603-225-4681
US Army Corps of Engineers (USACE) .....	978-318-8087
<b>US Department of Agriculture:</b>	
Natural Resource Conservation Service (NRCS) .....	603-868-7581
Cheshire County, Walpole.....	603-756-2988
Sullivan County, Newport .....	603-863-4297
Cheshire County, Milford.....	603-673-2409 Ext. #4
<b>Mitigation Funding Resources</b>	
404 Hazard Mitigation Grant Program (HMGP) .....	NH HSEM
406 Public Assistance and Hazard Mitigation .....	NH HSEM
Community Development Block Grant (CDBG).....	NH HSEM, NH OPD, also refer to RPC
Dam Safety Program.....	NHDES
Emergency Generators Program by NESEC <sup>‡</sup> .....	NH HSEM
Emergency Watershed Protection (EWP) Program .....	USDA, NRCS
Flood Mitigation Assistance Program (FMAP) .....	NH HSEM, NH OPD
Flood Plain Management Services (FPMS).....	USACE
Mitigation Assistance Planning (MAP) .....	NH HSEM
Mutual Aid for Public Works.....	NHMA
National Flood Insurance Program (NFIP) <sup>†</sup> .....	NH OPD, NH HSEM
Power of Prevention Grant by NESEC <sup>‡</sup> .....	NH HSEM
Project Impact .....	NH HSEM
Roadway Repair & Maintenance Program(s) .....	NHDOT
Section 14 Emergency Stream Bank Erosion & Shoreline Protection .....	USACE
Section 103 Beach Erosion .....	USACE
Section 205 Flood Damage Reduction .....	USACE
Section 208 Snagging and Clearing.....	USACE
Shoreline Protection Program .....	NHDES
Wetlands Programs .....	NHDES

NESEC - Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH HSEM for more information or visit the Consortium's website at <http://www.nesec.org/index.cfm>.

Note regarding **National Flood Insurance Program (NFIP)** and **Community Rating System (CRS)**:

The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community's floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. The NH Office of Strategic Initiatives can provide additional information regarding participation in the NFIP-CRS Program.

## **FEMA Region 1 Mitigation Planning Webliography**

### **REGULATORY INFORMATION**

Final Rule: 44 CFR 201.6 <http://www.fema.gov/pdf/help/fr02-4321.pdf>

Disaster Mitigation Act of 2000 (DMA 2K) <http://www.fema.gov/library/viewRecord.do?id=1935>

### **DISASTERS AND NATURAL HAZARDS INFORMATION**

FEMA-How to deal with specific hazards <http://www.ready.gov/natural-disasters>

Natural Hazards Center at the University of Colorado <http://www.colorado.edu/hazards>

National Oceanic and Atmospheric Administration (NOAA): Information on various projects and research on climate and weather. <http://www.websites.noaa.gov>

National Climatic Data Center active archive of weather data. <http://lwf.ncdc.noaa.gov/oa/ncdc.html>

Northeast Snowfall Impact Scale <http://www.erh.noaa.gov/rnk/Newsletter/Fall%202007/NESIS.htm>

Weekend Snowstorm Strikes the Northeast Corridor Classified as a Category 3 "Major" Storm  
<http://www.publicaffairs.noaa.gov/releases2006/feb06/noaa06-023.html>

### **FLOOD RELATED HAZARDS**

FEMA Coastal Flood Hazard Analysis & Mapping

<http://www.fema.gov/national-flood-insurance-program-0/fema-coastal-flood-hazard-analyses-and-mapping-1>

Floodsmart <http://www.floodsmart.gov/floodsmart/>

National Flood Insurance Program (NFIP) <http://www.fema.gov/nfip>

Digital quality Level 3 Flood Maps <http://msc.fema.gov/MSD/statemap.htm>

Flood Map Modernization

<http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization>

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Reducing Damage from Localized Flooding: A Guide for Communities, 2005 FEMA 511

<http://www.fema.gov/library/viewRecord.do?id=1448>

### **FIRE RELATED HAZARDS**

Firewise <http://www.firewise.org>

NOAA Fire Event Satellite Photos <http://www.osei.noaa.gov/Events/Fires>

U.S. Forest Service, USDA <http://www.fs.fed.us/land/wfas/welcome.htm>

Wildfire Hazards – A National Threat <http://pubs.usgs.gov/fs/2006/3015/2006-3015.pdf>

### **GEOLOGIC RELATED HAZARDS**

USGS Topographic Maps <http://topomaps.usgs.gov/>

Building Seismic Safety Council <http://www.nibs.org/?page=bssc>

Earthquake hazard history by state <http://earthquake.usgs.gov/earthquakes/states/>  
USGS data on earthquakes <http://earthquake.usgs.gov/monitoring/deformation/data/download/>  
USGS Earthquake homepage <http://quake.wr.usgs.gov>  
National Cooperative Geologic Mapping Program (NCGMP) <http://ncgmp.usgs.gov/>  
Landslide Overview Map of the Conterminous United States  
<http://landslides.usgs.gov/learning/nationalmap/>  
Kafka, Alan L. 2008. Why Does the Earth Quake in New England? Boston College, Weston  
Observatory, Department of Geology and Geophysics  
[http://www2.bc.edu/~kafka/Why\\_Quakes/why\\_quakes.html](http://www2.bc.edu/~kafka/Why_Quakes/why_quakes.html)  
Map and Geographic Information Center, 2010, "Connecticut GIS Data", University of Connecticut  
[http://magic.lib.uconn.edu/connecticut\\_data.html](http://magic.lib.uconn.edu/connecticut_data.html)  
2012 Maine earthquake  
[http://www.huffingtonpost.com/2012/10/17/maine-earthquake-2012-new-england\\_n\\_1972555.html](http://www.huffingtonpost.com/2012/10/17/maine-earthquake-2012-new-england_n_1972555.html)  
WIND-RELATED HAZARDS  
ATC Wind Speed Web Site <http://www.atcouncil.org/windspeed/index.php>  
Hilliard 2/20/2014 Pg. 3  
U.S. Wind Zone Maps <http://www.fema.gov/safe-rooms/wind-zones-united-states>  
Tornado Project Online <http://www.tornadoproject.com/>

National Hurricane Center <http://www.nhc.noaa.gov>  
Community Hurricane Preparedness Tutorial <http://meted.ucar.edu/hurricane/chp/hp.htm>  
National Severe Storms Laboratory, 2009, "Tornado Basics",  
[http://www.nssl.noaa.gov/primer/tornado/tor\\_basics.html](http://www.nssl.noaa.gov/primer/tornado/tor_basics.html)

## **DETERMINING RISK AND VULNERABILITY**

HAZUS <http://www.hazus.org>  
FEMA Hazus Average Annualized Loss Viewer  
<http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cb8228309e9d405ca6b4db6027df36d9&extent=-139.0898,7.6266,-48.2109,62.6754>  
Vulnerability Assessment Tutorial: On-line tutorial for local risk and vulnerability assessment  
<http://www.csc.noaa.gov/products/nchaz/htm/mitigate.htm>  
Case Study: an example of a completed risk and vulnerability assessment  
<http://www.csc.noaa.gov/products/nchaz/htm/case.htm>

## **GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND MAPPING**

The National Spatial Data Infrastructure & Clearinghouse (NSDI) and Federal Geographic Data  
Committee (FGDC) Source for information on producing and sharing geographic data  
<http://www.fgdc.gov>  
The OpenGIS Consortium Industry source for developing standards and specifications for GIS data  
<http://www.opengis.org>  
Northeast States Emergency Consortium (NESEC): Provides information on various hazards, funding  
resources, and other information <http://www.nesec.org>

US Dept of the Interior Geospatial Emergency Management System (IGEMS) provides the public with both an overview and more specific information on current natural hazard events. It is supported by the Department of the Interior Office of Emergency Management. <http://igems.doi.gov/>  
FEMA GeoPlatform: Geospatial data and analytics in support of emergency management  
<http://fema.maps.arcgis.com/home/index.html> Hilliard 2/20/2014 Pg. 4

## **DATA GATHERING**

National Information Sharing Consortium (NISC): brings together data owners, custodians, and users in the fields of homeland security, public safety, and emergency management and response. Members leverage efforts related to the governance, development, and sharing of situational awareness and incident management resources, tools, and best practices <http://nisconsortium.org/>

The Hydrologic Engineering Center (HEC), an organization within the Institute for Water Resources, is the designated Center of Expertise for the US Army Corps of Engineers <http://www.hec.usace.army.mil/>

National Water & Climate Center <http://www.wcc.nrcs.usda.gov/>

WinTR-55 Watershed Hydrology

<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1042901>

USACE Hydrologic Engineering Center (HEC) <http://www.hec.usace.army.mil/software/>

Stormwater Manager's Resource Center SMRC <http://www.stormwatercenter.net>

USGS Current Water Data for the Nation <http://waterdata.usgs.gov/nwis/rt>

USGS Water Data for the Nation <http://waterdata.usgs.gov/nwis/>

Topography Maps and Aerial photos <http://www.terraserver.com/view.asp?tid=142>

National Register of Historic Place <http://www.nps.gov/nr/about.htm>

National Wetlands Inventory <http://www.fws.gov/wetlands/>

ICLUS Data for Northeast Region [http://www.epa.gov/ncea/global/iclus/inclus\\_nca\\_northeast.htm](http://www.epa.gov/ncea/global/iclus/inclus_nca_northeast.htm)

## **PLANNING**

American Planning Association <http://www.planning.org>

Planners Web - Provides city and regional planning resources <http://www.plannersweb.com>

## **FEMA RESOURCES**

Federal Emergency Management Agency (FEMA) [www.fema.gov](http://www.fema.gov) Hilliard 2/20/2014 Pg. 5

National Mitigation Framework <http://www.fema.gov/national-mitigation-framework>

Federal Insurance and Mitigation Administration (FIMA) <http://www.fema.gov/fima>

Community Rating System (CRS) <http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-rating-system>

FEMA Building Science <http://www.fema.gov/building-science>

National Flood Insurance Program (NFIP) <http://www.fema.gov/national-flood-insurance-program>

Floodplain Management & Community Assistance Program

<http://www.fema.gov/floodplain-management>

Increased Cost of Compliance (ICC): ICC coverage allows homeowners whose structures have been repeatedly or substantially damaged to cover the cost of elevation and design requirements for rebuilding with their flood insurance claim up to a maximum of \$30,000.



<http://www.fema.gov/national-flood-insurance-program-2/increased-cost-compliance-coverage>  
National Disaster Recovery Framework <http://www.fema.gov/national-disaster-recovery-framework>  
Computer Sciences Corporation: contracted by FIMA as the NFIP Statistical Agent, CSC provides information and assistance on flood insurance to lenders, insurance agents and communities  
[www.csc.com](http://www.csc.com)

Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan: A Guidebook for Local Governments <https://www.fema.gov/ar/media-library/assets/documents/89725>  
Mitigation Best Practices Portfolio <http://www.fema.gov/mitigation-best-practices-portfolio>  
FEMA Multi-Hazard Mitigation Planning Website <http://www.fema.gov/multi-hazard-mitigation-planning>  
FEMA Resources Page <http://www.fema.gov/plan/mitplanning/resources.shtm> Hilliard 2/20/2014 Pg. 6  
Local Mitigation Plan Review Guide <http://www.fema.gov/library/viewRecord.do?id=4859>  
Local Mitigation Planning Handbook complements and liberally references the Local Mitigation Plan Review Guide above <http://www.fema.gov/library/viewRecord.do?id=7209>  
HAZUS <http://www.fema.gov/protecting-our-communities/hazus>  
Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards  
<http://www.fema.gov/library/viewRecord.do?id=6938>  
Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials  
<http://www.fema.gov/library/viewRecord.do?id=7130>  
Mitigation Planning for Local and Tribal Communities-Independent Study Course  
<http://training.fema.gov/EMIWeb/IS/is318.asp>

### **Region 1 Mitigation Contacts**

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Email: marilyn.hilliard@fema.dhs.gov

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Email: nan.johnson@fema.dhs.gov  
Massachusetts; Rhode Island; Vermont

Brigitte Ndikum-Nyada, Community Planner  
Phone: 617-956-7614  
Email: brigitte.ndikum-nyada@fema.dhs.gov  
Connecticut; Maine; New Hampshire  
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### **OTHER FEDERAL RESOURCES**

U.S. Army Corps of Engineers: Provides funding for floodplain management planning and technical assistance and other water resources issues. [www.nae.usace.army.mil](http://www.nae.usace.army.mil)  
Natural Resources Conservation Service: Technical assistance to individual land owners, groups of landowners, communities, and soil and water conservation districts. [www.nrcs.usda.gov](http://www.nrcs.usda.gov)  
NOAA Coastal Services Center <http://www.csc.noaa.gov/>

Rural Economic and Community Development: Technical assistance to rural areas and smaller communities in rural areas on financing public works projects. [www.rurdev.usda.gov](http://www.rurdev.usda.gov)

Farm Service Agency: Manages the Wetlands Reserve Program (useful in open space or acquisition projects by purchasing easements on wetlands properties) and farmland set aside programs [www.fsa.usda.gov](http://www.fsa.usda.gov)

National Weather Service: Prepares and issues flood, severe weather and coastal storm warnings. Staff hydrologists can work with communities on flood warning issues; can give technical assistance in preparing flood-warning plans. [www.weather.gov](http://www.weather.gov)

Economic Development Administration (EDA): Assists communities with technical assistance for economic development planning [www.osec.doc.gov/eda/default.htm](http://www.osec.doc.gov/eda/default.htm)

National Park Service: Technical assistance with open space preservation planning; can help facilitate meetings and identify non-structural options for floodplain redevelopment. [www.nps.gov](http://www.nps.gov)

Fish and Wildlife Services: Can provide technical and financial assistance to restore wetlands and riparian habitats. [www.fws.gov](http://www.fws.gov)

Department of Housing & Urban Development [www.hud.gov](http://www.hud.gov)

Small Business Administration: SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would qualify for) to install mitigation measures. They can also loan the cost of bringing a damaged property up to state or local code requirements. [www.sba.gov/disaster](http://www.sba.gov/disaster)

Environmental Protection Agency [www.epa.gov](http://www.epa.gov)

Sustainability/Adaptation/Climate Change

Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards

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<http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf>

Resilient Sustainable Communities: Integrating Hazard Mitigation& Sustainability into Land Use

<http://www.earth.columbia.edu/sitefiles/file/education/documents/2013/Resilient-Sustainable-Communities-Report.pdf>

U.S. EPA <http://www.epa.gov/climatechange/>

NOAA National Ocean Service (NOS) <http://oceanservice.noaa.gov/>

The Northeast Climate Research Center (NRCC) folks were heavily involved in climate data in the NCA, below. They have a wealth of historic climate data and weather information, trends, etc.

<http://www.nrcc.cornell.edu/>

NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments) <http://ccrun.org/home>

Community and Regional Resilience: Perspectives from hazards, disasters, and emergency management

[http://www.resilientus.org/library/FINAL\\_CUTTER\\_9-25-08\\_1223482309.pdf](http://www.resilientus.org/library/FINAL_CUTTER_9-25-08_1223482309.pdf)

National Fish, Wildlife and Plants Climate Adaptation Strategy [www.wildlifeadaptationstrategy.gov](http://www.wildlifeadaptationstrategy.gov)

ICLEI Local Governments for Sustainability <http://www.iclei.usa.org/>

Kresge Foundation Survey

<http://www.kresge.org/news/survey-finds-communities-northeast-are-trying-plan-for-changes-climate-need-help-0>

New England's Sustainable Knowledge Corridor <http://www.sustainableknowledgecorridor.org/site/>

The Strategic Foresight Initiative (SFI)

[http://www.fema.gov/pdf/about/programs/oppa/findings\\_051111.pdf](http://www.fema.gov/pdf/about/programs/oppa/findings_051111.pdf)

Northeast Climate Choices [http://www.climatechoices.org/ne/resources\\_ne/nereport.html](http://www.climatechoices.org/ne/resources_ne/nereport.html)

Northeast Climate Impacts Assessment <http://www.northeastclimateimpacts.org/>  
 Draft National Climate Assessment Northeast Chapter released early 2013  
<http://ncadac.globalchange.gov/>  
 Northeast Chapter of the National Climate Assessment of 2009:  
<http://www.globalchange.gov/images/cir/pdf/northeast.pdf>  
 ClimateNE [www.climatenortheast.com](http://www.climatenortheast.com)  
 Scenarios for Climate Assessment and Adaptation <http://scenarios.globalchange.gov/>  
 Northeast Climate Science Center <http://necsc.umass.edu/>  
 FEMA Climate Change Adaptation and Emergency Management  
<https://www.llis.dhs.gov/content/climate-change-adaptation-and-emergency-management-0>  
 Climate Central <http://www.climatecentral.org>

**OTHER RESOURCES**

New England States Emergency Consortium (NESEC): NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Resources are available on earthquake preparedness, mitigation, and hurricane safety. [www.nesec.org](http://www.nesec.org)

Association of State Floodplain Managers (ASFPM): ASFPM has developed a series of technical and topical research papers, and a series of proceedings from their annual conferences. [www.floods.org](http://www.floods.org)

National Voluntary Organizations Active in Disaster (VOAD) is a non-profit, nonpartisan membership organization that serves as the forum where organizations share knowledge and resources throughout the disaster cycle - preparation, response, recovery and mitigation. <http://www.nvoad.org/>

**ADDITIONAL WEBSITES**

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	<a href="http://www.colorado.edu/hazards/">http://www.colorado.edu/hazards/</a>	Searchable database of references and links to many disaster-related websites.
National Emergency Management Association	<a href="http://nemaweb.org">http://nemaweb.org</a>	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	<a href="http://disasterfinder.gsfc.nasa.gov/Disaster">http://disasterfinder.gsfc.nasa.gov/Disaster</a>	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	<a href="http://ltpwww.gsfc.nasa.gov/ndrd/main/html">http://ltpwww.gsfc.nasa.gov/ndrd/main/html</a>	Searchable database of worldwide natural disasters.

Sponsor	Internet Address	Summary of Contents
U.S. State & Local Gateway	<a href="http://www.statelocal.gov/">http://www.statelocal.gov/</a>	General information through the federal-state partnership.
National Weather Service	<a href="http://nws.noaa.gov/">http://nws.noaa.gov/</a>	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	<a href="http://waterdata.usgs.gov/nwis/rt">http://waterdata.usgs.gov/nwis/rt</a>	Provisional hydrological data
Dartmouth Flood Observatory	<a href="http://www.dartmouth.edu/~floods">http://www.dartmouth.edu/~floods</a>	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	<a href="http://www.fema.gov/about/programs/nfip/index.shtm">http://www.fema.gov/about/programs/nfip/index.shtm</a>	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	<a href="http://www.met.fsu.edu/explores/tropical.html">http://www.met.fsu.edu/explores/tropical.html</a>	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	<a href="http://lightningsafety.com/">http://lightningsafety.com/</a>	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	<a href="http://thunder.msfc.nasa.gov/research.html">http://thunder.msfc.nasa.gov/research.html</a>	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	<a href="http://www.llnl.gov/hmc/">http://www.llnl.gov/hmc/</a>	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	<a href="http://www.tornadoproject.com/">http://www.tornadoproject.com/</a>	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	<a href="http://www.nssl.noaa.gov/">http://www.nssl.noaa.gov/</a>	Information about and tracking of severe storms.
Earth Satellite Corporation	<a href="http://www.earthsat.com/">http://www.earthsat.com/</a>	Flood risk maps searchable by state.
USDA Forest Service Web	<a href="http://www.fs.fed.us/land">http://www.fs.fed.us/land</a>	Information on forest fires and land management.

# Appendix D: Hazard Mitigation Resource Profiles

The following are resources that can be used in Hazard Mitigation projects:

U.S. Army Corps of Engineers

Contacts:

John Kennelly, Chief, Special Studies Section (for Flood Plain Management Services activities), Phone: 978-318-8505, Fax: 978-318-8080, E-mail: [John.R.Kennelly@usace.army.mil](mailto:John.R.Kennelly@usace.army.mil)

Mike Keegan, Chief, Project Planning Section (for Section 14, 103, and 205 authorities), Phone: 978-318-8087, Fax: 978-318-8080, E-mail: [Michael.F.Keegan@usace.army.mil](mailto:Michael.F.Keegan@usace.army.mil)

Address: US Army Corps of Engineers  
New England District  
696 Virginia Road  
Concord, Massachusetts 01742-2751

**Description and Mission:** The Corps of Engineers is a multi-disciplinary engineering and environmental organization that has been identifying and meeting the water resources needs of the nation. These needs have been in the areas of flood damage reduction, flood plain information and management, navigation, shore protection, environmental restoration, water supply, streambank protection, recreation, and fish and wildlife resources conservation, as well as technical assistance in other water resources areas.

The New England District (NAE) of the Corps of Engineers is responsible for managing the Corps' civil responsibilities in a 66,000 square-mile region encompassing the six New England states east of the Lake Champlain drainage basin. The District and its leadership are headquartered in Concord, Massachusetts. The missions of the New England District are many and varied. They include:

- flood damage reduction
- navigation improvements and maintenance
- natural resource management
- streambank and shoreline protection
- disaster assistance
- environmental remediation and engineering
- engineering and construction management support to other agencies

**Flood Mitigation Involvement:** As a result of the catastrophic floods in 1936, 1938 and 1955, the Corps was called upon to undertake a comprehensive flood damage reduction program. Since then the Corps has built many flood control structures throughout New England. These include 35 dams and reservoirs, five hurricane protection barriers (two are operated by the Corps) and approximately 60 local flood protection projects. The New England District has also completed two nonstructural projects involving the relocation of flood prone property and the acquisition of natural flood storage areas. The Corps also provides technical assistance to states and municipalities in locally constructed flood damage mitigation projects and to promote wise and informed use of floodplain and natural retention areas in order to minimize potential future flood damages.

**Mitigation Goals and Objectives:** The New England District has two primary mitigation objectives with respect to flood damage reduction. The first objective is the operation and maintenance of the 35 flood control reservoirs and two hurricane barriers that provide protection to the Connecticut, Merrimack, Thames, Naugatuck, and Blackstone River Basins. The second objective is to continue to work with the states and communities in New England to address flooding problems affecting the region.

**Projects Desired:** The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria.

**COE Resources with Respect to Hazard Mitigation:** The New England Division assists in meeting national, regional and local needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically, there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

**Section 14 - Emergency Stream Bank & Shoreline Protection:** This work consists of evaluating alternatives to provide emergency protection to public facilities, such as highways and bridges that are threatened due to erosion. The current Federal limit on Section 14 projects is \$500,000. The local sponsor is required to provide 25 percent of the cost of developing plans and specifications and of construction.

**Section 103 - Beach Erosion:** Investigations conducted under this authority are to determine methods of protecting public facilities that have been threatened by beach erosion. Currently there is a Federal limit of \$2,000,000 and the local sponsor is required to contribute 35 percent of plans, specifications and construction. The local sponsor is also required to cost-share equally the cost of the feasibility investigation that exceeds \$100,000. The first \$100,000 is at full Federal expense.

**Section 205 - Flood Damage Reduction:** Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

**Section 208 - Snagging and Clearing:** This emergency program is designed to reduce flood damage potential by identifying and removing obstructions that contribute to flooding by causing higher flood stages in the floodways. The Federal limit under this program is \$500,000 and the local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

The New England Division also has two Planning Assistance Programs, which provide opportunities for the States to obtain assistance in addressing water resource issues. These programs are the Section 22, Planning Assistance to the States (PAS) program and the Section 206, Flood Plain Management Services (FPMS) program.

**Planning Assistance to States Program (PAS):** The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

**Flood Plain Management Services (FPMS):** The FPMS Program is designed for the Corps to assist States and local communities in improving management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Ice Engineering Research Division

U.S. Army Cold Regions Research and Engineering Laboratory

Contact:

Dr. J-C Tatinclaux, Chief, Ice Engineering Research Division

Phone: 603-646-4187 Fax: 603-646-4477

E-mail: [Jean-Claude.Tatinclaux@cr102.usace.army.mil](mailto:Jean-Claude.Tatinclaux@cr102.usace.army.mil)

Website: <http://www.crrel.usace.army.mil/ierd/>

Address: US Army Cold Regions Research and Engineering Laboratory  
Ice Engineering Research Division  
72 Lyme Road  
Hanover, NH 03755-1290



**Description and Mission:**

The US Army Cold Regions Research and Engineering Laboratory (CRREL) is a Corps of Engineers' research laboratory that is dedicated to multi-disciplinary engineering and research that addresses the problems and opportunities unique to the world's cold regions. CRREL exists largely to solve the technical problems that develop in cold regions, especially those related to construction, transport, and military operations. Most of these problems are caused by falling and blowing snow, snow on the ground, ice in the air and in the ground, river ice, ice on seas and lakes, and ice effects on manmade materials. CRREL serves the Corps of Engineers and its clients in three main areas:

- Traditional military engineering, which deals with problems that arise during conflict;
- Military construction and operations technology, i.e., the building and maintenance of military bases, airfields, roads, ports, and other facilities; and
- Civil works, which involves the Corps in such things as flood protection, navigation on inland waterways and coastal engineering.

CRREL also deals with cold regions problems for the other defense services, for civilian agencies of the federal government, and to some extent for state agencies, municipalities and private industry.

CRREL's Ice Engineering Research Division (IERD) was created to research, analyze and solve ice problems in and around water bodies, including ice jam flooding and ice accumulation in lock chambers, to ice buildup at water intakes and the destructive forces that moving ice exerts on riverine or coastal structures. In cooperation with the New England District (NAE) of the Corps of Engineers (located in Concord, MA), IERD personnel provide technical assistance before, during and after ice jam flood emergencies. IERD research has resulted in the design and construction of a number of low-cost ice control structures as well as nonstructural mitigation measures. IERD also provides instruction on dealing with river ice problems to local emergency management agencies.

**Flood Mitigation Involvement:** IERD is frequently called upon by the various Corps Districts to provide technical assistance to states and municipalities in the form of emergency mitigation. IERD is also involved with Corps and local agencies in developing locally constructed flood damage mitigation projects and promoting wise and informed use of floodplain areas in order to minimize potential future flood damages.

**Mitigation Goals and Objectives:** The IERD has two primary mitigation objectives with respect to flood damage reduction. The first objective is to work with the Corps and other federal, state and local agencies to design and implement ice control methods to reduce ice-related flood potential. The second is to work with the states and communities nationwide as well as in New England to address ice-related emergency flooding problems affecting the region.

**Projects Desired**

CRREL and IERD are a national resource ready to apply our unique facilities and capabilities to solve problems and conduct innovative, state-of-the-art research and technical support. There are a number of mechanisms that enable IERD and the rest of CRREL to partner with various Federal, non-DoD and private sector entities. The Federal Technology Transfer Act of 1986 (15 USC 3710a) allows CRREL to collaborate with any non-Federal partner on research and technical support

consistent with the mission of the laboratory. The Intergovernmental Cooperation Act (31 USC 6505) lets CRREL work with state and local governments on a broad range of reimbursable projects. Under the "Authority to Sell" (10 USC 2539b), CRREL can provide test and evaluation services to the states and the private sector. This includes the testing and evaluation of materials, equipment, models, computer software, and other items. The laboratory can also provide support to other Federal agencies via the Economy in Government Act (31 USC 1535) through MOUs/MOAs that establish a framework for the partnership and provide a concise description of the planned work. CRREL's 35 active Cooperative Research and Development Agreements (CRADAs) with industry and academia and 17 Intergovernmental Cooperation Agreements with states and local governments in 1998 demonstrate a robust program in this area and the relevance of CRREL's research to many segments of American society beyond DoD.

The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria. Through the Corps, IERD has been involved in Section 205 Flood Damage Reduction program, Section 22 Planning Assistance to States Program (PAS)) projects, the Section 206 Flood Plain Management Services (FPMS) program funded jointly with FEMA, and numerous instances of technical assistance.

### **CRREL IERD Resources with Respect to Hazard Mitigation**

**Corps:** CRREL works jointly with the Corps' New England Division to address regional and local ice-related hazard mitigation needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional

authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation

**Section 205 - Flood Damage Reduction:** Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

**Section 22 - Planning Assistance to States Program (PAS):** The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

**Section 206 - Flood Plain Management Services (FPMS):** The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

**Personnel:** IERD was created to research, analyze and solve ice problems in and around water bodies. The technical experience of the staff and their in-depth research and field capabilities combine with CRREL's unique Ice Engineering Facility to form one of the premier ice engineering organizations in the world. IERD has a staff of 15 engineers and technicians experienced in technical analyses, methods and engineering solutions to ice problems -- that is, any situation where the effects of ice cause flooding, increase operational and maintenance requirements of water control projects, impede navigation, or adversely impact the environment in cold regions.

**Equipment and Facilities:** The Ice Engineering Facility was built to increase the research capabilities of the U.S. Army Cold Regions Research and Engineering Laboratory. It is a two-story building approximately 160 by 210 feet containing three primary cold spaces: the test Basin, Flume, and Research Area. They have recently designed and built a new Wind Tunnel Facility. In addition, there is a machine room in the basement, an instrumentation corridor separating the flume and test basin spaces, a shop/storage area, and one sample-storage cold room.

**The Test Basin** was designed primarily for large-scale work on ice forces on structures, such as drill platforms and bridge piers, and for tests using model icebreakers. The Basin is 30 feet wide, 8 feet deep and 120 feet long. The room is designed to operate at any temperatures between +65° and -10°F with very even temperature distribution, which results in uniform ice thickness. Other studies

conducted in the Test Basin concern the formation of ice pressure ridges, ice problems in and around navigation locks and vertical uplift forces.

The Flume is situated in a room where the temperature can be regulated between +65° and -20° F. The Flume is 2 by 4 feet in cross section and 120 feet long. It can tilt from +2° to -1° slope, have a flow capacity of nearly 14 cubic feet per second and have a refrigerated bottom. Some other studies conducted in the Flume are the formation of ice covers and frazil ice, the hydraulics of ice-covered rivers, the formation of ice jams, and the effect of ice covers on sediment transport and scour.

Possibly the most versatile portion of the Ice Engineering Facility is the Research Area. This room is 80 by 160 feet clear span and has a temperature range of +65° to -10°F. Piping capable of providing a flow of 1, 2, 4 or 8 cubic feet per second is located on one side of the room, and a large drain trough is on the other. The floor is designed for loads up to 400 pounds per square foot. Models of reaches can be constructed in this area to test ways to alleviate ice jams through channel modification. Tests of the bearing capacity of large ice sheets and cold-testing of vehicles and structures are a few of the other potential uses of this space. Tests conducted in this room will help to alleviate much of the flooding caused by ice jams.

#### **USDA, Natural Resources Conservation Service**

Contacts:

Gerald J. Lang, Technology Leader; Phone: 603-868-7581, Fax: 603-868-5301

E-mail: [gerald.lang@nh.usda.gov](mailto:gerald.lang@nh.usda.gov)

Edward Hansalik, Civil Engineer; Phone: 603-868-7581, Fax: 603-868-5301

E-mail: [ehansalik@nh.usda.gov](mailto:ehansalik@nh.usda.gov)

**Address:** Federal Building, 2 Madbury Road, Durham, NH 03824

**Description and Mission:** The Natural Resources Conservation Service (NRCS) is a Federal agency within the US Department of Agriculture. The mission of the NRCS is to help people conserve, improve and sustain our natural resources and environment. NRCS, formerly the Soil Conservation Service, is the lead federal agency for conservation on private land. NRCS provides conservation technical assistance through local conservation districts and Resource Conservation and Development (RC&D) Councils to individuals, communities, watershed groups, tribal governments, federal, state, and local agencies, and others. NRCS has an interdisciplinary staff of professional engineers, planners, biologists, foresters, agronomists, and soil scientists working together to provide the necessary technical assistance to solve resource or environmental problems. NRCS products typically include conservation plans, study reports, engineering designs, and resource maps.

**Authorities and Funding:** NRCS state and field offices derive funding from two possible sources, direct Federal appropriations and reimbursable agreements with agencies and units of government. NRCS manages several programs; Environmental Quality Incentive Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetland Reserve Program (WRP), Forestry Incentives Program (FIP), and Farmland Protection Program (FPP) which provide cost-share assistance to landowners and users (primarily agricultural or forestry land) to install conservation practices to

restore and protect natural resources. NRCS can also provide technical assistance ranging from preliminary reviews to complete detail designs to landowners/users solving resource problems even if financial assistance is not being provided for the installation of conservation practices. This assistance is dependent on staff availability and priorities.

NRCS also manages the Emergency Watershed Protection (EWP) program, which can provide financial and technical assistance to units of government and groups to repair damages sustained from a natural disaster (flood, fire, hurricane, tornado) creating an imminent hazard to life and property. The restoration efforts must be environmentally and economically cost effective and typically includes clearing debris from clogged stream channels, stabilizing eroded stream banks and restoring vegetation for stabilization purposes. NRCS can also provide technical assistance to watershed associations or groups to develop comprehensive plans for improving or protecting the watershed environment (water quality, flood reduction, wildlife habitat).

**Mitigation Involvement:** The NRCS can provide technical assistance to conduct inventories, to complete watershed or site-specific plans, or to develop detail engineering and construction designs for conservation applications that will help reduce future damages from natural disasters. Some examples of past mitigation efforts include: floodplain management studies for towns, site assessments of stream flow impairments, stabilization designs to protect structures which could sustain severe damages from another storm event, and small watershed plans addressing flooding problems. Some of these products can be provided through other conservation assistance efforts. However, the major jobs would require a reimbursable agreement with the state or towns to complete the work.

**Mitigation Goals and Objectives:** With respect to hazard mitigation, the goal of the NRCS in New Hampshire is to meet the needs of the State and local governments by providing timely technical assistance to support recovery and restoration efforts. NRCS can contribute this technical assistance by interacting directly with NH HSEM at the state level and having field staff working directly with Town Emergency Management officials at the local level. Short-term goals are to establish contacts with local officials and the conservation districts at the field office level to facilitate quicker response times. Intermediate and long-term objectives are to improve the cooperative efforts of working with NH HSEM and establish additional contacts for providing timely technical assistance at the local level.

**Projects/Planning Desired:** NRCS would like to work with local watershed associations to develop comprehensive plans addressing resource and environmental needs and opportunities in the priority watersheds as identified in the Unified Watershed Assessment. These plans can provide the basis for targeting and requesting special funding to meet the needs of the local watershed association. Technical assistance for planning and designing along with public information dissemination are the typical activities the agency can provide in this effort.

## **NRCS Resources with respect to Hazard Mitigation**

**Personnel:** NRCS in New Hampshire has a workforce of 45 staff members along with 5 multi-state staff members. Approximately 22 staff members consisting of engineers, biologists, foresters, conservation planners, and technicians are available to provide some assistance in mitigation efforts. Support staff of a GIS specialist, computer specialist and public information specialist could assist in providing information for public outreach. This staff is available to provide limited assistance under present program funding authorities. However, larger projects would require reimbursement for planning and design assistance.

**Equipment, Physical Facilities and Other Capabilities:** All of the field offices and State office have computers and access to the internet. All of the field offices have survey equipment and all engineers have the use of CADD software. All field offices have access to small meeting rooms and access to the Federal Telecommunications System. Government vehicles are located at all field offices for use by government employees and could be made available in emergencies.

### **Northeast States Emergency Consortium (NESEC)**

Contacts:

Edward S. Fratto, Executive Director: Phone: 781-224-9876, Fax: 781-224-4350

E-Mail: [www.nesec.org](http://www.nesec.org)

Kristin M. O'Brien, Assistant Executive Director: Phone: 781-224-9876; e-mail: [www.nesec.org](http://www.nesec.org)

Address: Northeast States Emergency Consortium, 419 Main Street, Suite 5  
Wakefield, MA 01880

Organization Description: The Northeast States Emergency Consortium, Inc. (NESEC) is a 501(c)(3) not-for-profit natural disaster mitigation and emergency management organization, located in Wakefield, Massachusetts. NESEC is the only multi-hazard consortium of its kind in the country and is supported and funded by the Federal Emergency Management Agency (FEMA). The eight Northeast States of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont form the consortium. NESEC has a full-time Executive Director, and Assistant. It is governed by a Board of Directors. The Board is comprised of the Directors of the State Emergency Management Agencies from each of the six New England States and the States of New York and New Jersey.

Organization Mission: NESEC works in partnership with government and private organizations to reduce losses of life and property from natural disasters in the Northeast United States. The Northeast States are vulnerable to most of the natural hazards, including hurricanes, earthquakes, coastal and inland flooding, tornadoes and micro-bursts, forest fires, drought, lightning, blizzards, and other forms of severe weather. Our developed urban areas and the desire to build and live on waterfront property have increased our degree of risk from natural hazards.

### **Mitigation Programs**

Grants: NESEC raises funds from government and private sources to support local mitigation projects. These funds are awarded on a competitive basis in the form of grants in the range of \$500-5,000. The name of this program is called the **Power of Prevention**. All grant programs are administered in cooperation with the New Hampshire Homeland Security and Emergency Management (NH HSEM). Communities interested in participating should contact NH HSEM.

HAZUS: NESEC assists FEMA PROJECT IMPACT Communities in the use of HAZUS as a planning platform for incorporating multi-hazard disaster prevention initiatives. NESEC can produce a HAZUS report using default data for each of the initial PROJECT IMPACT Communities. Priority is given to PROJECT IMPACT communities; however, assistance may be provided to other communities as resources allow. This report provides an excellent starting point for communities wishing to utilize HAZUS to identify potential hazards. The NESEC HAZUS Report is multi-hazard and usually contains information on earthquakes, tornadoes, flood and wind.

There is no fee or charge for producing the default HAZUS Report and meeting with the community to discuss the results. All HAZUS support is arranged in cooperation with the New Hampshire Homeland Security and Emergency Management (NH HSEM). Communities interested in participating should contact NH HSEM.

Emergency Generators: NESEC assists communities to establish a partnership with their electric utilities and service companies. The partnership would conduct an energy efficiency audit of the community, recommend cost saving measures, and implement a cost saving plan. Monthly savings could be used to fund emergency generator(s) for local critical facilities. The utility or energy service company could then lease, install, and maintain generator(s) in a community.

The community would pay a monthly charge for the lease agreement. This charge would not exceed the savings derived through energy efficiency measures, so there would be no capital outlay or additional cost to the community. In fact, some communities may be able to reduce their monthly electric bills in an amount that exceeds the cost of the generator(s) lease agreement.

Monthly savings and utility participation will vary from state to state and community-to-community depending on present electric power usage and efficiency measures and deregulation. There is no fee or charge for assisting communities in establishing partnerships with electric utilities. NESEC assistance will be provided as resources allow. All emergency generator support is arranged in cooperation with the New Hampshire Homeland Security and Emergency Management (NH HSEM). Communities interested in participating should contact NH HSEM.

### **Federal Mitigation Grant Programs**

Pre-Disaster Mitigation Grant Program: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on

funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. <http://www.fema.gov/government/grant/pdm/index.shtm>

Hazard Mitigation Grant Program: The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

<http://www.fema.gov/government/grant/hmgrp/index.shtm>

Flood Mitigation Assistance Program: The Flood Mitigation Assistance (FMA) program was created as part of the National Flood Insurance Reform Act of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the [National Flood Insurance Program](#).

FEMA provides FMA funds to assist states and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program.

<http://www.fema.gov/government/grant/fma/index.shtm>



# Appendix E: Documentation of the Planning Process

# Alstead Hazard Mitigation Plan Update Work Group

## Meeting #1

## AGENDA

November 3, 2022  
5:30 p.m.

Alstead Town Office  
15 Mechanic Street  
Alstead, NH 03602

- 1. Introduction**
  - a. Discuss the process to update the Plan and the addition of recently added hazards to the State Hazard Mitigation Plan
- 2. Status of Previous Hazard Mitigation Actions**
  - a. Review the Action Plan from the existing Hazard Mitigation Plan to determine what has been completed, deleted, or deferred to the updated plan
- 3. Risk Assessment**
  - a. Determine the *Impact, Probability* and *Overall Risk* of each potential hazard
- 4. Identify Past and Potential Hazards**
  - a. Review each hazard type and other information on the chart provided in the existing plan
  - b. Add any new hazards that have occurred since the previous plan was adopted
  - c. Add any potential hazard concerns
- 5. Next Meeting**
  - a. Potential date: December 1, 2022 at 5:30 p.m.

**Alstead Hazard Mitigation Plan Update  
Work Group**

**Meeting #2**

**AGENDA**

**December 1, 2022  
5:30 p.m.**

**Alstead Town Hall  
9 Main Street  
Alstead, NH 03602**

- 1. Identify Past and Potential Hazards**
  - a. Review each hazard type and other information on the chart provided in the existing plan
  - b. Identify additional hazards that have occurred since the previous plan was adopted
  - c. Identify potential hazard concerns
  
- 2. Existing Mitigation Strategies**
  - a. Review the existing mitigation strategies matrix and edit as needed
  
- 3. Critical Facilities**
  - a. Review critical facilities and update with addresses
  
- 4. Future Meeting Dates**
  - a. Meeting #3: January 5, 2023
  - b. Meeting #4: January 26, 2023 or February 9, 2023
  - c. Meeting #5: March 2, 2023

**Alstead Hazard Mitigation Plan Update  
Work Group**

**Meeting #3**

**AGENDA**

**January 5, 2023  
5:30 p.m.**

**Alstead Town Offices  
15 Mechanic Street  
Alstead, NH 03602**

- 1. Existing Mitigation Strategies**
  - a. Review the existing mitigation strategies matrix and edit as needed.
- 2. Potential Strategies: Filling Gaps in Coverage**
  - a. Review the potential strategies matrix and determine which are needed in the Action Plan.
- 3. Building a List of New Strategies**
  - a. Consider adding new strategies to the STAPLEE chart.
- 4. Final Review of Critical Facilities**
  - a. Review and update the list of Critical Facilities.
- 5. Hazard Mitigation Goals**
  - a. Review hazard mitigation goals.
- 6. Future Meeting Dates**
  - a. Meeting #4: January 26, 2023 or February 9, 2023
  - b. Meeting #5: March 2, 2023

**Alstead Hazard Mitigation Plan Update  
Work Group**

**Meeting #4**

**AGENDA**

**February 9, 2023  
5:30 p.m.**

**Alstead Town Offices  
15 Mechanic Street  
Alstead, NH 03602**

- 1. Build a List of New Strategies**
  - a. Add new strategies to the STAPLEE chart.
- 2. Create the Action Plan**
  - a. Develop the action plan with timeline.
- 3. Final Review of Critical Facilities**
  - a. Review and update the list of Critical Facilities.
- 4. Hazard Mitigation Goals**
  - a. Review hazard mitigation goals.
- 5. Next Meeting**
  - a. Meeting #5: March 2, 2023

**Alstead Hazard Mitigation Plan Update  
Work Group**

**Meeting #5**

**AGENDA**

**March 2, 2023**

**5:30 p.m.**

**Alstead Town Offices  
15 Mechanic Street  
Alstead, NH 03602**

1. Review Key Chapters of the Draft Plan
  - a. Review and edit chapters 3, 4, 7, and 8
  - b. Review other parts of the Plan as needed
2. Discuss the final steps to FEMA approval

Alstead Hazard Mitigation Work Group Sign-in Sheet for Meeting #1 November 3, 2022	
Name	Title
Kim Kercewich	Fire Chief
Jesse Moore	Ambulance
Gordon Kemp	Planning Board
Darren Perlongo	Deputy Emergency Management Director
Steve Reynolds	Emergency Management Director
Joe Levesque	Alstead Select Board
Prescott Trafton	Road Agent
Penny Gendron	Police Department Administration
Stephen Murrell	Police Chief

Alstead Hazard Mitigation Work Group Sign-in Sheet for Meeting #2 December 1, 2022	
Name	Title
Darren Perlongo	Deputy Emergency Management Director
Kim Kercewich	Fire Chief
Werner Drouin	Ambulance
Penny Gendron	Police Department Administration
Stephen Murrell	Police Chief
Steve Reynolds	Emergency Management Director
Joe Levesque	Alstead Select Board
Prescott Trafton	Road Agent
Adam Vose	Ambulance
Jesse Moore	Ambulance
Gordon Kemp	Planning Board

Alstead Hazard Mitigation Work Group Sign-in Sheet for Meeting #3 January 5, 2023	
Name	Title
Darren Perlongo	Deputy Emergency Management Director
Kim Kercewich	Fire Chief
Penny Gendron	Police Department Administration
Stephen Murrell	Police Chief
Steve Reynolds	Emergency Management Director
Joe Levesque	Alstead Select Board
Adam Vose	Ambulance
Jesse Moore	Ambulance
Gordon Kemp	Planning Board

Alstead Hazard Mitigation Work Group Sign-in Sheet for Meeting #4 February 9, 2023	
Name	Title
Steve Reynolds	Emergency Management Director
Penny Gendron	Police Department Administration
Jesse Moore	Ambulance
Darren Perlongo	Deputy Emergency Management Director
Prescott Trafton	Road Agent
Kim Kercewich	Fire Chief



Alstead Hazard Mitigation Work Group Sign-in Sheet for Meeting #5 March 2, 2023	
Name	Title
Joe Levesque	Alstead Select Board
Gordon Kemp	Planning Board
Steve Reynolds	Emergency Management Director
Jesse Moore	Ambulance
Stephen Murrell	Police Chief
Kim Kercewich	Fire Chief
Darren Perlongo	Deputy Emergency Management Director
Prescott Trafton	Road Agent

# Appendix F: Project Status Sheet

The following form can be used to keep track of projects identified in the hazard mitigation plan that are in progress or that have been completed.

Project Title	Page # in Plan	Date of Project Completion	Comments