

# NELSON HAZARD MITIGATION PLAN UPDATE 2019

Nelson, New Hampshire

FEMA Final Approval March 8, 2019

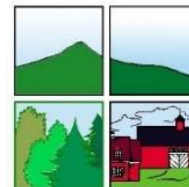


Prepared by the:

Town of Nelson Hazard Mitigation Committee  
&  
Southwest Region Planning Commission  
[www.swrpc.org](http://www.swrpc.org)



FEMA



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**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY** ..... 4

**1. INTRODUCTION** ..... 6

    Purpose ..... 6

    Authority ..... 6

    Funding Source ..... 6

    Scope of the Plan ..... 6

    Methodology ..... 6

    Public Committee Meetings ..... 7

    Public Participation ..... 8

    Resource List for Hazard Mitigation Committee ..... 8

    Plan Updates ..... 8

    Acknowledgements ..... 9

    Hazard Mitigation Goals ..... 10

**2. COMMUNITY PROFILE** ..... 11

    Town Overview ..... 11

    Disaster Risk ..... 12

    Development Patterns ..... 12

    Consideration for Development ..... 12

    Current Development Trends ..... 12

    Housing Trends Table ..... 13

    Population Trends ..... 13

    Population Projections ..... 13

    Future Development Constraints ..... 14

    Development in Hazard Areas ..... 14

    National Flood Insurance Program (NFIP) ..... 14

**3. HAZARD IDENTIFICATION & PAST EVENTS** ..... 15

    Flooding Disaster Declarations ..... 15

    Flooding-Localized-Low Risk ..... 16

    Drought-Medium Risk ..... 17

    Extreme Temperature-High Risk ..... 17

    Wildfire-High Risk ..... 18

    Lightning Strikes-Medium Risk ..... 19

    Tornado/Downburst/Severe Wind-Very High Risk ..... 19

    Hurricane/Tropical Storm-High Risk ..... 20

    Earthquake-Very Low Risk ..... 22

    Severe Winter Weather-Very High Risk ..... 23

    Radon-Very Low Risk ..... 26

    Hazardous Materials Spills-High Risk ..... 26

    Man-Made Hazards, Dams-Very Low Risk ..... 27

|                   |  |    |
|-------------------|--|----|
| <b>4.</b>         | <b>ASSESSING PROBABILITY, SEVERITY, &amp; RISK</b> .....                   | 29 |
| <b>5.</b>         | <b>POTENTIAL HAZARDS: ESTIMATING POTENTIAL LOSS</b> .....                  | 30 |
| <b>6.</b>         | <b>CRITICAL FACILITIES</b> .....   | 34 |
|                   | Category 1 - Emergency Response Services.....                              | 34 |
|                   | Category 2 - Non-Emergency Response Facilities .....                       | 35 |
|                   | Category 3 - Facilities/Populations to Protect.....                        | 35 |
|                   | Category 4 - Potential Resources .....                                     | 36 |
| <b>7.</b>         | <b>EXISTING MITIGATION STRATEGIES &amp; PROPOSED IMPROVEMENTS</b> .....    | 37 |
|                   | Description of Existing Programs .....                                     | 37 |
|                   | Existing Protection Matrix.....  | 38 |
|                   | Status of Previous Mitigation Actions .....                                | 40 |
| <b>8.</b>         | <b>EXISTING &amp; POTENTIAL MITIGATION STRATEGIES</b> .....                | 41 |
|                   | Identifying Gaps in Coverage .....   | 41 |
|                   | Proposed Mitigation Strategies Prioritized .....                           | 43 |
|                   | STAPLEE Chart .....  | 44 |
| <b>9.</b>         | <b>IMPLEMENTATION SCHEDULE &amp; ACTION PLAN</b> .....                     | 45 |
|                   | Implementation Schedule for Priority Mitigation Actions-Summary Chart..... | 45 |
| <b>10.</b>        | <b>ADOPTION, IMPLEMENTATION, MONITORING &amp; UPDATE</b> .....             | 47 |
|                   | Adoption .....   | 47 |
|                   | Monitoring & Updates .....   | 47 |
|                   | Continued Public Involvement .....   | 47 |
|                   | Implementation of the Plan through Existing Programs .....                 | 48 |
|                   | Certificate of Adoption .....  | 49 |
| <b>APPENDICES</b> |  |    |
|                   | A. Hazard Descriptions .....   | 50 |
|                   | B. Risk Assessment.....  | 53 |
|                   | C. Resources Used in Preparation of this Plan.....                         | 55 |
|                   | D. Hazard Mitigation Resource Profiles .....                               | 67 |
|                   | E. Documentation of the Planning Process .....                             | 77 |
|                   | F. Town Maps – Bridges, Culverts, & Dams in Nelson .....                   | 84 |
|                   | G. Project Status Sheet.....   | 86 |

## Executive Summary

The Nelson Hazard Mitigation Plan serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Nelson Hazard Mitigation Committee and contains statements of policy adopted by the Board of Selectmen in Chapter 10.

### Natural hazards are addressed as follows:

- Flooding
- Drought
- Extreme Temperatures
- Wildfire
- Lightning Strikes
- Tornado/Downburst/Wind
- Hurricane/Tropical Storm
- Earthquakes
- Severe Winter Weather
- Radon (Air/Water)
- HazMat Spills
- Dam Failure

The Nelson Hazard Mitigation Committee, as shown per Chapter 6, identified “Critical Facilities” and “Areas at Risk” as follows:

### Critical Facilities

- Nelson School
- Nelson Fire Station
- Munsonville Fire Station
- Safety Building
- Nelson Town Hall

### Facilities/Populations to Protect

- Special needs population
- School/Public Library
- Churches
- Nelson Village (historic)
- Town Common
- Ballfield
- Apple Hill Center for Chamber Music

The Nelson Hazard Mitigation Committee identified existing hazard mitigation programs as follows:

- HSEM\* Emergency Operations Plan
- School Evacuation Plan
- Town Warning System
- Local Road Design Standards
- Local Bridge Program
- Code Enforcement
- Health Officer
- Building Codes
- Shoreland Protection Program
- Snow Plow Policy
- Spill Prevention and Counter Measures Plan
- Town Radio System
- Tree Maintenance
- Town Capital Improvements Plan
- Mutual Aid
- Erosion & Sedimentation Plans
- Emergency Back-up Power
- Town Master Plan
- Wetlands Protection
- Safety Awareness
- Mass Inoculation Plan
- Storm Water Protection
- Forest Fire Protection
- Other Mutual Aid

\* Homeland Security and Emergency Management

The Nelson Hazard Mitigation Committee prioritized newly identified hazard mitigation strategies as follows:

1. Increase forest fire protection training.
2. Work with SWRPC to perform a culvert inventory of road/stream crossings.
3. Place outreach material for natural hazards at the Town Office and/or add information to the website. Include links to the Federal Emergency Management Agency (FEMA) and HSEM website.
4. Replace the Baily Brook Bridge on Old Stoddard Road.
5. Obtain a sign for fire warning/danger levels.
6. Invite a representative from NH Office of Strategic Initiatives (OSI) to explain the National Flood Insurance Program (NFIP) program to the Board of Selectmen and Planning Board.
7. Install a new generator at Town Hall to provide emergency back-up power.
8. Update the Master Plan.
9. Update the School Evacuation Plan and include evacuation routes.
10. Determine locations and install dry hydrants.
11. Update the Emergency Operation Plan.
12. Obtain an agreement from the school to use the school as an emergency shelter.
13. Consider adding Town Hall as an emergency shelter.

# Chapter 1

## Introduction

### **Purpose**

The Nelson Hazard Mitigation Plan Update 2019 is a planning tool to be used by the Town of Nelson, as well as other local, state and federal governments, in their efforts to reduce the effects from natural and man-made hazards. This plan does not constitute any sections of Nelson's Master Plan or Town Ordinances.

### **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, 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 DMA which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

### **Funding Source**

This Plan was funded by the NH Homeland Security and Emergency Management, with grants from FEMA's Pre-disaster Mitigation Program. The Town of Nelson provided in-kind service with the hours of attendance of members of the Hazard Mitigation Team throughout this process.

### **Scope of the Plan**

The scope of this Plan includes the identification of past and potential natural and manmade hazards affecting the Town of Nelson, 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 Nelson Hazard Mitigation Committee developed the content of the Nelson Hazard Mitigation Plan by following tasks set forth in the handbook. The Committee 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 the Regional Planning Commission. The results of this research were shared with the Committee 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 committee. The Nelson Board of Selectmen appointed the committee members.

**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 and man-made hazards.

**Task 4: Review Community Capabilities:** The Committee brainstormed on the type of hazards and locations that have sustained or could be susceptible to each hazard within the town. The results were the Hazard Identification Map, which can be found at the end of the plan.

The Committee then identified and catalogued all of the critical facilities within the town. The result is found in Chapter 6 with a location map at the end of the plan.

**Task 5: Conduct a Risk Assessment:** The Committee 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 Committee identified plans and policies that are already in place to reduce the effects of man-made and natural hazards. Then the Committee evaluated the effectiveness of the existing measures to identify where they can be improved. The Committee then 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 Nelson that this plan be monitored and updated annually or after a presidentially declared disaster. Chapter 10 addresses this issue.

**Task 8: Review & Adopt the Plan:** The Committee members reviewed and approved each section of the plan as it was completed. After acceptance by the Committee, 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 Board of Selectmen formally adopted the plan on February 13, 2019. The plan was then granted formal approval by HSEM March 8, 2019 and the Formal Approval letter from the Federal Emergency Management Agency (FEMA) was received on March 25, 2019.

**Task 9: Create a Safe & Resilient Community:** The committee 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 committee are needed to maintain the timeframes identified for completion of activities. Incorporation of the plan into other land use plans and the Capital Improvement Plan 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 Committee and the public for review and comment. The document was also provided to the NH Homeland Security and Emergency Management for their review and comment.

### **Public Committee Meetings**

Working committee meetings were held at Nelson Town Offices on the following dates: July 17, August 14, September 18, and October 30, 2018.

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



### **Public Participation**

In addition, an article was printed in the Southwest Region Planning Commission Newsletter prior to the first meeting to inform the members of the community as well as surrounding communities and other stakeholders interested in participating in this plan update. Copies of the newsletter were sent to the 34 towns within the region, the County Office, businesses, and other interested parties. It is also available on the Southwest Region Planning Commission website. In addition to the SWRPC newsletter and website, an email of the SWRPC Happenings was sent to approximately 430 addresses, including neighboring communities, counties, businesses, and academia. The email contains notices of public meetings and events. A copy of this mailing is included in Appendix E.

A copy of the draft plan was made available for public review and input at the Town Office from November 26 to December 10, 2018. 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 can be found in Appendix E. There were no comments from the public received during the drafting stage of the plan as well as following the public viewing period.

The public will be invited to participate in the annual reviews and future updates by a notice in the local newsletter and on the town website.

### **Resource List for Hazard Mitigation Committee**

Nelson'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 Nelson's EMD, or designee, and either attended committee work sessions or provided valuable input and guidance through telephone conversation or printed data. Training support has been offered by some of those on this resource list.

#### **Homeland Security and Emergency Management (HSEM):**

33 Hazen Drive 1-800-852-3792  
Concord, NH 03305

**Field Representative:** Heather Dunkerley  
**State Hazard Mitigation Planner:** Kayla Henderson

#### **New Hampshire Department of Transportation (NHDOT):**

John Kallfelz (District 4) Swanzey, NH 03446      352-2302

#### **Eversource Utility:**

Laurel Boivin Keene, NH      357-7309 Ext. 5115

#### **New Hampshire Department of Environmental Services (NHDES)-Dam Bureau**

Nancy Baillargeon 271-3406

### **Plan Updates**

During the planning process, the Committee reviewed relevant portions of the previous hazard mitigation plan and updated those portions accordingly. Unchanged sections were incorporated into this updated plan while other sections were amended to reflect changes. Particular attention was given to the previous mitigation strategies that have been completed and to give a status update on those that remain on the list.

The 10-step process was followed during the meetings. The original plan was used as a base 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:

- Ch. 1. Introduction-updated Methodology, Acknowledgements, etc., and added Plan Updates;
- Ch. 2. Community Profile-NFIP policies updated, added Continued Compliance with NFIP;
- Ch. 3. Hazard Identification-updated hazards and their location;
- Ch. 4. Assessing Probability, Severity, and Risk-updated risk assessment;
- Ch. 5. Vulnerability Assessment-estimated potential losses;
- Ch. 6. Critical Facilities-updated locations;
- Ch. 7. Existing Mitigation Strategies and Proposed Improvements-updated chart and other data, updated chart for Status of Previous Mitigation Action Items;
- Ch. 8. Proposed Mitigation Strategies-updated STAPLEE chart;
- Ch. 9. Prioritized Implementation Schedule-updated Action Plan;
- Ch. 10. Adoption, Implementation, Monitoring and Updates-Adoption certificate, updated information; Appendices-agendas, resources, public documentation.

This update was prepared with assistance from Planners at Southwest Region Planning Commission 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 Nelson Board of Selectmen extends special thanks to the Nelson Hazard Mitigation Committee as follows:

Dennis Dellagreca, *Nelson EMD*  
Jackie Chapman, *Nelson EMD Deputy, Rescue Captain*  
Maury Collins, *Nelson Selectman*  
Mary Dellagreca, *Nelson EMD Deputy*  
Edie Drinkwater, *Nelson Admin. Asst.*  
Gary Robinson, *Nelson Selectman*  
Richard Pratt, *Nelson Police Chief*  
Mike Tarr, *Nelson Road Agent*  
Dave Upton, *Nelson Board of Selectmen*  
Andrew P. Ward, *Nelson Deputy Fire Chief*

The Nelson Board of Selectmen offers thanks to HSEM for developing the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 which served as a model for this plan. (<http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf>) 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.

**NH HSEM/FEMA final approval granted on March 8, 2019. The Hazard Mitigation Plan must be updated within five years of this date.**

### **Hazard Mitigation Goals**

The Nelson Hazard Mitigation Committee reviewed the Goals set forth in the State of New Hampshire Multi Hazard Mitigation Plan Update 2018. The committee generally concurs with those goals and made minor modifications to better meet the Town's goals.

|  |
|--|
| <p style="text-align: center;"><b>Hazard Mitigation Goals<br/>Town of Nelson, NH</b></p> |
|--|

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

1. To improve upon the protection of the general population, the citizens of the Town of Nelson and guests, from all natural and man-made hazards.
2. To reduce the potential impact of natural and man-made disasters on the Town of Nelson's Emergency Response Services, Critical Facilities, and infrastructure.
3. To reduce the potential impact of natural and man-made disasters on the Town of Nelson's economy, natural resources, historic/cultural treasures, and private property.
4. To improve the Town of Nelson's Emergency Preparedness and Disaster Response and Recovery Capability.
5. To reduce the Town of Nelson's risk with respect to natural and man-made hazards through a community education program.
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 Nelson's infrastructure and natural environment.
8. To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals.

## Chapter 2

### Community Profile

#### Town Overview

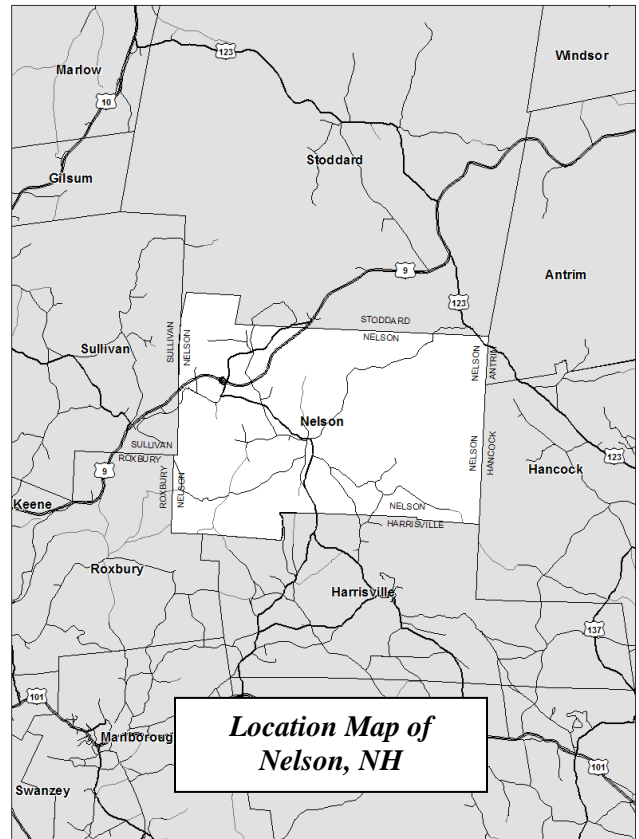
The Town of Nelson is located in the eastern portion of Cheshire County in Southwest New Hampshire. Nelson is bounded on the north side by Stoddard, westerly by Sullivan and Roxbury, southerly by Harrisville, and easterly by Hancock and Antrim. The Town population is 729.<sup>1</sup>

The Town of Nelson consists of a total of 14,898.2 acres or 23.3 square miles consisting of 14,019.1 acres of land area and 879 acres of water area.<sup>2</sup> Nelson has several waterbodies, including Granite Lake, Silver Lake, Spoonwood Pond, Nubanusit Lake, Center Pond, Rye Pond, Tolman Pond, Woodward Pond, and the Ellis Reservoir. The Ellis Reservoir is primarily located in the neighboring Town of Sullivan, but a small portion is located in Nelson. Otter Brook, Brickyard Brook, and Bailey Brook are the three main streams in Nelson. Additionally, Nelson has large amounts of land that have been publicly and privately protected from development. The largest parcel, known as the Spoonwood Mutual Covenant-Greengate, consists of approximately 420 acres of steep slopes and ledges.

The topography of Nelson varies significantly, ranging from a series of steep slopes and ledges notably Thunder Hill, Hardy Hill, Hurd Hill, Osgood Hill, Holt Hill, Fletcher Hill, Tolman Hill, Felt Hill, and Rollstone Mountain that comprise a substantial portion of the southwestern, northwestern, and eastern sections of Nelson, to the flatter marshlands along the brooks meandering through town. The highest point in town is the summit of Osgood Hill (also known as Nelson Pinnacle), with an elevation of 2,253 feet above sea level.<sup>1</sup>

According to U.S. Climate Data, the average high temperature in 2017 was 30.2°F in January and 80°F in July. The annual precipitation in 2017 was 45.4 inches of rainfall and 59.47 inches of snowfall.

A three-member Board of Selectmen governs the Town of Nelson. The Town has a part-time Fire Chief with a volunteer Fire Department. There is a part-time Police Chief with one part-time police officer, a full-time Road Agent and Assistant Road Agent. The Hospital and Medical Clinic, Cheshire Medical Center/Dartmouth Hitchcock-Keene, is located in Keene, 11 miles west of Nelson. The town's official website is [www.townofnelson.com](http://www.townofnelson.com).



<sup>1</sup>2010 US Census Data

<sup>2</sup> Land Area and Water Area data from New Hampshire Association of Regional Planning Commissions

### **Disaster Risk**

Nelson is prone to a variety of man-made and natural hazards. The Nelson Hazard Mitigation Committee evaluated these hazards based on the likelihood the event would occur and the impact it would have to determine the associated risk. Extreme temperature, wildfire, tornado/downburst/severe wind, hurricane/tropical storm, severe winter weather, and hazardous materials spills are all considered high or very high risk natural disasters to the Town of Nelson. In addition, drought and lightning strikes have been given a medium risk rating.

According to the 2018 State of New Hampshire Natural Hazards Mitigation Plan, large NH wildland fires run in roughly 50-year cycles. Significant woody fuel was deposited in the forests during the hurricane of 1938 and the ice storm of 2008. Present concern exists that debris in the area forests from the 2008 storm may fuel future wildfires.

Winter weather has proven to be a regular yearly hazard throughout the town of Nelson. Nelson is susceptible to receiving large volumes of snow from Nor'easters due to its geographical 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.

### **Development Patterns**

Nelson is a small community that is predominantly residential. There are three concentrations of residential use in Nelson: The Munsonville area, which is largely seasonal housing around Granite Lake; the Nelson Village area, the historical heart of the community; and the Tolman Pond/Lake Nubanusit area.

The second largest land use category is agricultural use, which accounts for approximately 30% of all properties.

Commercial uses include Granite Lake Stoneware and Tucker Sheet Metal. There are also several in-home businesses.

Governmental uses in Nelson include the fire station, town hall, the Old Brick Schoolhouse, library and a boat landing. These uses are contained on approximately 7 acres of town land.

Institutional land in Nelson includes churches, cemeteries, the school in Munsonville, and the Apple Hill Center for Chamber Music.

The amount of land that is currently developed is only about 7 % of Nelson's land.

### **Consideration for Development**

Several factors have played, and will continue to play, an important role in the development of Nelson. 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, the many lakes and ponds; and the availability of utilities such as sanitary sewers. These factors have an impact, both individually and cumulatively, on where and how development occurs.

### **Current Development Trends**

The pattern and distribution of land use in Nelson has not changed appreciably over the last forty-five years. Residential development continues to be the primary (active) land use; agriculture, recreation and protected lands constitute more land area than does residential development, but the actual use of these lands are of a more passive nature. The Nelson Hazard Mitigation Committee expects residential development in the coming years to come in the form of single-family homes scattered along available road frontage throughout the town. The central portion of the town along Old Stoddard Road, as well as the southeastern corner of the town, are areas having greater potential for future development. Given the predominance of residential over non-residential development in Nelson, a conclusion can be reached that Nelson is essentially a bedroom community for employment and service centers such as the City of Keene.

The table below shows the number of housing units in each decennial from 1970 to 2010. There was an overall increase of 205% in new housing units that were built during that time period. The trend in the table indicates that the peak in building homes in Nelson was between 1980 and 1990 when the Town experienced a 121.6 % increase during the 10 year period. In the 10 years between the past two census years (2000 and 2010), Nelson averaged 6 new houses per year.

**Housing Trends 1970-2010**

|                      | 1970 | 1980  | 1990   | 2000 | 2010 |
|----------------------|------|-------|--------|------|------|
| <b>Housing Units</b> | 151  | 171   | 379    | 400  | 460  |
| <b>% Change</b>      | ---- | 13.2% | 121.6% | 5.5% | 15%  |

*Source: NH Office of Strategic Initiatives (OSI)*

New houses bring additional people. The next table shows the population trends during the same period.

**Population Trends 1970-2010**

|                   | 1970 | 1980  | 1990 | 2000  | 2010 |
|-------------------|------|-------|------|-------|------|
| <b>Population</b> | 304  | 442   | 535  | 634   | 729  |
| <b>% Change</b>   | ---  | 45.4% | 21%  | 18.5% | 15%  |

*Source: NH Office of Strategic Initiatives (OSI)*

The table shows that the rate of population increase is slowing down during each decade. The 2010 figures show that the rate of new housing units built equaled the rate of population increase.

**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 Strategic Initiatives (OSI) prepares population projections every five years for each community in the state. The projections for Nelson are presented below in five-year intervals up to the year 2040, beginning with population estimates from 2015. Using these projections, Nelson is expected to grow in population by approximately 6% between 2015 and 2040.

**Population Projections**

| 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | Change<br>2015-2040 |
|------|------|------|------|------|------|---------------------|
| 727  | 745  | 763  | 766  | 768  | 770  | 5.9%                |

*Source: NH Office of Strategic Initiatives (OSI)*

### **Future Development Considerations**

Future development in Nelson should take into consideration the use of best management practices for all types of potential hazards. Included in this is proper site selection, erosion controls, underground utilities, access, building construction materials and methods as well as others.

### **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. According to the State's Coordinator for the National Flood Insurance Program (NFIP), Nelson has no special flood hazard areas. The Nelson Hazard Mitigation Committee identified specific locations where flooding has occurred in Chapter 3, Hazard Identification. While the increase in development also increases the vulnerability for hazards that can occur townwide, measures have been taken to reduce the overall impact to the community through actions such as ditch maintenance, tree trimming, and outreach/education through the town website and newsletter.

### **National Flood Insurance Program**

Nelson is currently not a participating member of NFIP. The date of the current Digital Flood Insurance Rate Maps (DFIRM) and the Flood Insurance Study for the Town of Nelson is May 23<sup>rd</sup>, 2006. There are no "Repetitive Loss Properties" insured under the NFIP within the Town.

*Maps can be viewed on-line at:*

<https://msc.fema.gov/webapp/wcs/stores/servlet>

## Chapter 3

### Hazard Identification & Past Events

The following is a list of natural and man-made disasters that have or could affect the Town of Nelson. These hazards were identified from the State of New Hampshire Multi Hazard Mitigation Plan Update 2018 and the Federal Emergency Management Administration website. The committee determined that landslides and avalanches are not a threat to the town and did not include those hazards in this plan.

#### Hazards

Flooding  
 Drought  
 Extreme Temperature  
 Wildfire  
 Lightning Strike  
 Tornado/Downburst/Severe Wind  
 Hurricane/Tropical Storm  
 Earthquake  
 Severe Winter Weather  
 Radon  
 Hazardous Materials Incident  
 Dam Breach/Failure

A complete definition of each of these hazards can be found in Appendix A.

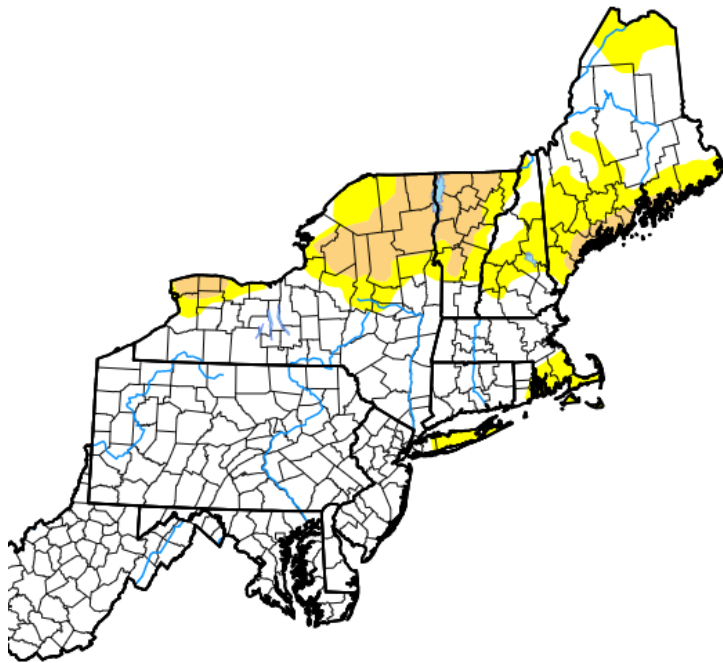
| Hazard   | Date              | Location   | Comments   |
|--|-------------------|--|--|
| Below is a listing of Disaster Declarations for flooding events within the State of New Hampshire. Several severe events have caused significant damage to structures and roadways within the southwest region. Some of the historic flood events may be listed under Hurricane/Tropical Storm instead of this category. |                   |  |  |
| <b>FLOODING - DISASTER DECLARATIONS</b>  |                   |  |  |
| Flood  | 1927              | Southern NH  | Damage to Road Network. Caused many roads to wash out.   |
| Flood  | March 11-21, 1936 | All Counties   | Damage to Road Network. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather. Run-off from melting snow/rain overflowed rivers.             |
| Flood/ Severe Storm  | August 27, 1986   | Cheshire, Hillsborough Counties  | FEMA Disaster # 771-DR (Presidentially Declared Disaster) \$1,005,000 in damage  |
| Flood/ Severe Storm  | April 16, 1987    | Cheshire, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, & Sullivan Counties   | FEMA Disaster Declaration # 789-DR (Presidentially Declared Disaster). Flooding of low-lying areas along river caused by snowmelt and intense rain. \$4,888,889 in damage. |
| Flood  | August 7-11, 1990 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties | FEMA Disaster Declaration # 876. Flooding caused by a series of storm events with moderate to heavy rains. \$2,297,777 in damage.  |



| FLOODING - DISASTER DECLARATIONS   |                       |   |   |
|--|-----------------------|---|---|
| Hazard   | Date                  | Location  | Comments  |
| Flood  | October 29, 1996      | Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties   | FEMA Disaster Declaration # 1077-DR. Flooding caused by heavy rains. \$2,341,273 in damage. |
| Flood  | July 2, 1998          | Southern NH   | FEMA Disaster Declaration # 1231. Severe storms and flooding                                |
| Flood  | October 26, 2005      | Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties             | FEMA Disaster Declaration # 1610. Severe storms and flooding.                               |
| Flood  | October-November 2005 | Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties   | FEMA Disaster Declaration # DR-1144-NH  |
| Flood  | May 25, 2006          | Belknap, Carroll, Hillsborough, Merrimack, Rockingham, and Strafford Counties | FEMA Disaster Declaration # 1643. Severe storms and flooding.                               |
| Flood  | April 16, 2007        | All counties  | FEMA Disaster Declaration # 1695. Severe storms and flooding.                               |
| Flood  | May 26-30, 2011       | Coos and Grafton Counties   | FEMA Disaster Declaration # DR-4006; May flood event.                                       |
| Flood  | May 29-31, 2012       | Cheshire County   | FEMA Disaster Declaration # 4065.   |
| Flood  | June 26-July 3, 2013  | Cheshire, Sullivan, and Grafton Counties                                      | FEMA Disaster Declaration #4139; \$6,389,704 (Statewide assistance). No local impact.       |
| Flood  | July 1-2, 2017        | Grafton County  | FEMA Disaster Declaration #4329; No local impact.   |
| Flood  | Oct. 29-Nov. 1, 2017  | Belknap, Carroll, Sullivan, Grafton and Coos Counties                         | FEMA Disaster Declaration #4355; No local impact.   |
| Flood  | March 2-5, 2018       | Rockingham County   | FEMA Disaster Declaration #4370; Severe storm and flooding. No local impact.                |
| FLOODING - LOCALIZED-LOW RISK  |                       |   |   |
| <p>There is some minor annual roadway flooding due to heavy rain and runoff. While this has created an inconvenience at times and some temporary detours, the impact to structures has been minimal to none. Some road repairs and ditch repairs have been needed. The town has been upsizing culverts and improving ditching to reduce these occurrences. No specific locations or events were determined by the committee.</p> |                       |   |   |

**DROUGHT - MEDIUM RISK**

The Town has had limited experience with severe drought conditions, however, the drought in the summer of 2016 caused some private wells to run dry, some of which had to be redrilled. There is no documentation on the number of wells affected. 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. Drought is a town-wide event, therefore, no specific locations are identified. The severity of droughts can be found by referring to the Palmer Drought Severity Index used by the Climate Prediction Center 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)



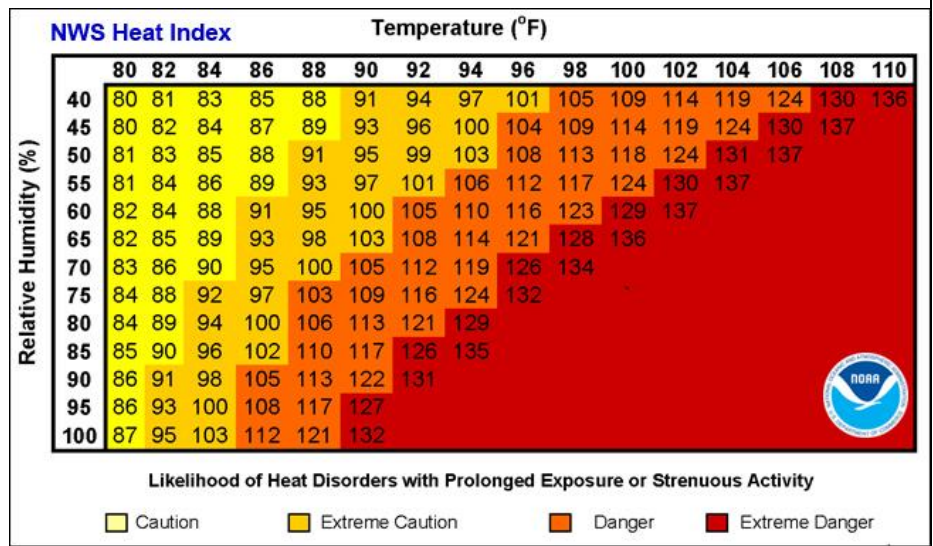
Map released: Thurs. August 9, 2018  
 Data valid: August 7, 2018 at 8 a.m. EDT

**Intensity:**

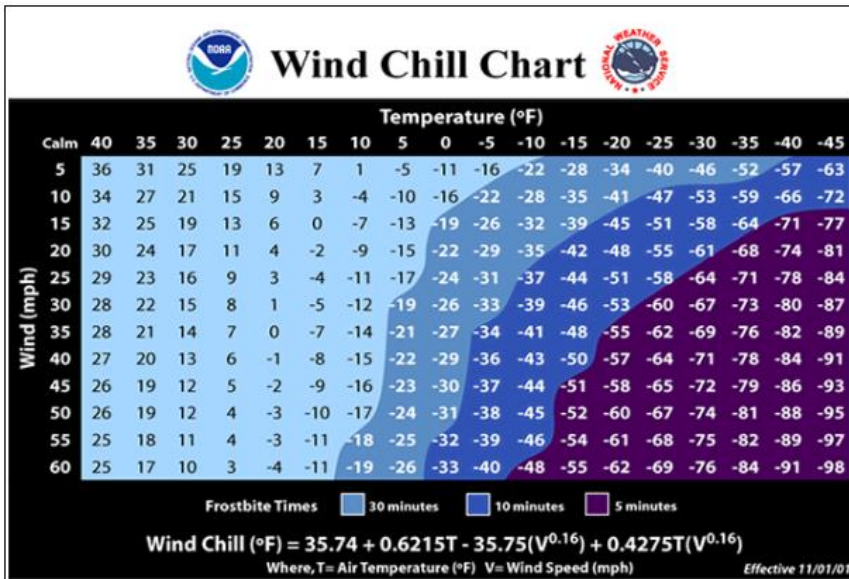
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

**EXTREME TEMPERATURE - HIGH RISK**

Extreme temperatures are a prolonged period of extreme hot or cold temperatures that pose a danger to people, animals, and crops. Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures and often coincide with high relative humidity. Although it is an infrequent event, it usually occurs on an annual basis between late July and August. The severity of extreme heat can be dangerous to those residents with medical conditions and the elderly. Extreme heat can add to the potential for wildfires and depletion of the water supply for firefighting. Extreme cold temperatures are characterized by periods of abnormally cold temperatures and are especially dangerous to the elderly and those who are exposed to the weather for extended periods. Power outages can lead to frozen pipes and loss of heat. These events are townwide. The Hazard Mitigation Committee 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 or cold.



Source: Both charts-National Weather Service



**WILDFIRES - HIGH RISK**

Wildfires are classified according to size: Class A-one-fourth acre or less; Class B- more 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.

| Hazard   | Date | Location                     | Comments   |
|----------|------|------------------------------|--|
| Wildfire | 2016 | Hardy Hill Road              | A severe storm caused a downed power line which led to brush igniting and becoming a wildfire. Approximately 2.25 acres burned which makes it a Class B fire. Mutual aid was called in to assist. The fire took 2 days to extinguish. No reported injuries, and no structures were impacted. |
| Wildfire | 2017 | Granite Lake and Nelson Road | Wind caused power line to fall and ignite brush. The damage was approximately 1/8 <sup>th</sup> of an acre which makes it a class A fire. No reported injuries, and no structures were impacted.   |

**LIGHTNING - MEDIUM RISK**

Lightning is an unpredictable hazard. It could strike anywhere in Nelson 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. There were no specific incidents that the committee documented and no injuries or structural damage identified. There has been some loss of property from lightning strikes, but no record of cost. A higher number of lightning strikes have occurred along Lead Mine Road, Old Stoddard Road, and Merricon Road.

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

Source: NOAA

**TORNADOS/SEVERE WIND/DOWNBURST (Fujita Scale given if known) – VERY HIGH RISK**

The **Enhanced Fujita Scale** is used to rate the intensity of a tornado by examining the damage caused by the tornado once it has passed. (see scale below). Source: <http://www.tornadoproject.com/fscale/fscale.htm>

**EF- Scale Number, Wind Speed, Frequency, and Type of damage**

**EF- 0**

Wind Speed: 65-85 mph; Frequency: 53.5%

Minor or no damage. Some damage to gutters, siding and roofs; breaks branches off trees; pushes over shallow-rooted trees.

**EF- 1**

Wind Speed: 86-110 mph; Frequency: 31.6%

Moderate damage. Roofs severely stripped; mobile homes damaged or overturned; windows and glass broken, loss of exterior doors.

**EF- 2**

Wind Speed: 111-135 mph; Frequency: 10.7%

Considerable damage. Roofs torn off well-constructed homes; foundations of framed homes shifted; mobile homes demolished; large trees snapped or uprooted; light object missiles generated; cars lifted off of ground. **EF- 3**

Wind Speed: 136-165 mph; Frequency: 3.4%

Severe Damage. Entire stories of well-constructed houses destroyed; severe damage to large building and malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown.

**EF- 4**

Wind Speed: 166-200 mph; Frequency: 0.7%

Extreme Damage. Well-constructed houses completely leveled; cars thrown and large missiles generated.

**EF- 5**

Wind Speed: >200 mph; Frequency: <0.1%

Total Destruction. Strong frame houses lifted off foundations and carried considerable distances to disintegrate; steel reinforced concrete structures are critically damaged; tall buildings collapse.

**TORNADOS/SEVERE WIND/DOWNBURST (Fujita Scale given if known) - cont.**

| Hazard      | Date           | Location                   | Comments   |
|-------------|----------------|----------------------------|--|
| Tornado     | Sept. 15, 1922 | Hillsborough County        | F2   |
| Tornado     | July 2, 1961   | Hillsborough County        | F2   |
| Tornado     | June 9, 1963   | Hillsborough County        | F2   |
| Tornado     | July 19, 1966  | Hillsborough County        | F2   |
| Tornado     | July 17, 1968  | Hillsborough County        | F2   |
| Tornado     | Aug. 20, 1968  | Hillsborough County        | F3   |
| Tornado     | July 2, 1997   | Hillsborough County        | F2   |
| Tornado     | May 23, 1998   | Hillsborough County        | F2   |
| Tornado     | July 24, 2008  | Deerfield/Northwood        | EF2. No impact locally.  |
| Severe Wind | June 2012      | Harrisville                | A downburst hit the neighboring town of Harrisville causing power outages in parts of Harrisville and Nelson for 3-4 days. No injuries or structural damage reported in Nelson.  |
| Severe Wind | 2011, 2014     | Southwestern New Hampshire | A microburst hit the area causing a temporary loss of power to some locations in the region. No injuries or structural damage and no impact to Town services.                    |
| Severe Wind | 2016           | Southwestern New Hampshire | Severe wind hit the area causing a temporary loss of power to some locations in the region. No injuries or structural damage and no impact to Town services.                     |
| Severe Wind | Aug.22, 2017   | Nelson                     | A downburst hit Nelson causing the loss of 12 utility poles, 4 houses damaged, and a horse was killed. No estimate of total damage was known. Some homes lost power temporarily. |
| Severe Wind | June 18, 2018  | Nelson                     | Straight line winds caused some structural damage and 2 cars were crushed by trees.  |

**HURRICANES (Category given if known) and TROPICAL STORMS - HIGH RISK**

Nelson’s inland location in southwestern New Hampshire reduces the risk of extremely high winds that are associated with hurricanes, however, tropical storms have occurred. The Hazard Mitigation Committee did not recall specific events that caused any impacts to the town services, injury or death, or structural damage from hurricanes or tropical storms.

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, however, and require preventative measures. (<http://www.nhc.noaa.gov/aboutsshws.php>)

**Saffir-Simpson Hurricane Wind Scale**

**Category, Sustained Winds, and Types of Damage**

**Category 1**

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

Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles will likely result in power outages that could last hours to several days.

**Category 2**

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

Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-

total power loss is expected with outages that could last from several days to weeks.

**Category 3**

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

Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water may 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: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

**Category 5**

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

Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

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

**HURRICANES (Category given if known) and TROPICAL STORMS - cont.**

| Hazard                 | Date               | Location                | Comments  |
|------------------------|--------------------|-------------------------|---|
| Hurricane              | September 21, 1938 | Southern New England    | Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 billion feet of marketable lumber blown down. Total storm losses of \$12,337,643 (1938 dollars). 186 mph max winds. |
| Hurricane (Carol)      | August 31, 1954    | Southern New England    | Category 3, winds 111-130 mph. Extensive tree and crop damage in NH, localized flooding.  |
| Hurricane (Edna)       | September 11, 1954 | Southern New England    | Category 3 in Massachusetts. Heavy rain in New Hampshire.   |
| Hurricane (Donna)      | September 12, 1960 | Southern and Central NH | Category 3 (Category 1 in NH). Heavy flooding in some parts of the State.   |
| Tr. Storm (Daisy)      | October 7, 1962    | Coastal NH              | Heavy swell and flooding along the coast.   |
| Tropical Storm (Doria) | August 28, 1971    | New Hampshire           | Center passed over NH resulting in heavy rain and damaging winds.   |
| Hurricane (Belle)      | August 10, 1976    | Southern New England    | Category 1. Primarily rain with resulting flooding in New Hampshire.  |
| Hurricane (Gloria)     | September, 1985    | Southern New England    | Category 2, winds 96-110 mph. Electric structures damaged; tree damages. Heavy rains, localized flooding, and minor wind damage in New Hampshire.   |
| Hurricane (Bob)        | August 19, 1991    | Southern New England    | Structural and electrical damage in region from fallen trees. 3 people were killed and \$2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR.  |

| HURRICANES (Category given if known) and TROPICAL STORMS - cont. |                       |                      |   |
|--|-----------------------|----------------------|---|
| Hazard   | Date                  | Location             | Comments  |
| Hurricane (Edouard)  | September 1, 1996     | Southern New England | Winds in NH up to 38 mph and 1 inch of rain along the coast. Roads and electrical lines damaged.                              |
| Tropical Storm (Floyd)   | September 16-18, 1999 | Southern New England | FEMA DR-1305-NH. Heavy Rains.   |
| Tropical Storm (Tammy)   | October 5-13, 2005    | East Coast of US     | Remnants of Tammy contributed to the October 2005 floods which dropped 20 inches of rain in some places in NH.                |
| Tropical Storm (Irene)   | 2011                  | New England states   | FEMA Disaster Declaration #DR-4026 and EM- 3333. Some temporary power outages were experienced in the Southwest region of NH. |

**EARTHQUAKES (Magnitude given if known) - VERY LOW RISK**

There have been no reported injuries or structural damage from earthquakes in Nelson. The table on the next page is used to categorize earthquakes using two different scales: Mercalli Scale and Richter Scale. The Richter Scale is more scientific and is based on the magnitude (amplitude of the largest seismic wave). The Mercalli Scale is based on observations by people who experienced the earthquake to describe its intensity.

| Modified Mercalli Scale vs. Richter Scale |   |                   |
|---|---|-------------------|
| Mercalli Intensity                        | Mercalli Observations   | Richter Magnitude |
| I   | Not felt by people  | 1-2               |
| II  | Felt by only a few people, especially on upper floors of buildings      | 3                 |
| III                                       | Felt by people lying down, seated on hard surface, or in tall buildings | 3.5               |
| IV  | Felt indoors by many, dishes and windows rattle                         | 4                 |
| V   | Generally felt by everyone; may wake from sleep                         | 4.5               |
| VI  | Trees sway, objects fall from walls & tables                            | 5                 |
| VII                                       | Walls crack, some structural damage                                     | 5.5               |
| VIII                                      | Building damage noticeable  | 6                 |
| IX  | Some buildings collapse   | 6.5               |
| X   | Ground cracks and landslides  | 7                 |
| XI  | Few buildings survive, bridge damage, severe landslide                  | 7.5               |
| XII                                       | Total Destruction, objects thrown into the air                          | 8                 |

Source: USGS Hazards Program

|            |                   |                       |   |
|------------|-------------------|-----------------------|---|
| Earthquake | 1638              | Central New Hampshire | 6.5-7                                     |
| Earthquake | October 29, 1727  | Off NH/MA coast       | Widespread damage Massachusetts to Maine. |
| Earthquake | December 29, 1727 | Off NH/MA coast       | Widespread damage Massachusetts to Maine. |

| EARTHQUAKES (Magnitude given if known) - cont.  |                         |                            |   |
|---|-------------------------|----------------------------|---|
| Hazard  | Date                    | Location                   | Comments  |
| Earthquake  | November 18, 1755       | Cape Ann, MA               | 6.0, much damage.   |
| Earthquake  | 1800s                   | Statewide New Hampshire    | 83 felt earthquakes in New Hampshire.   |
| Earthquake  | 1900s                   | Statewide New Hampshire    | 200 felt earthquakes in New Hampshire.  |
| Earthquake  | March 18, 1926          | Manchester, NH             | Felt in Hillsborough County.  |
| Earthquake  | December 20 and 24 1940 | Ossipee, NH                | Both earthquakes of magnitude 5.5, both felt for 400,000 sq miles, structural damage to homes, damage in Boston MA, water main rupture. |
| Earthquake  | December 28, 1947       | Dover-Foxcroft, ME         | 4.5   |
| Earthquake  | June 10, 1951           | Kingston, RI               | 4.6   |
| Earthquake  | April 26, 1957          | Portland, ME               | 4.7   |
| Earthquake  | April 10, 1962          | Middlebury, VT             | 4.2   |
| Earthquake  | June 15, 1973           | Near NH Quebec Border, NH  | 4.8   |
| Earthquake  | Jan. 19, 1982           | Gaza (west of Laconia), NH | 4.5, walls and chimneys cracked, damage up to 15 miles away in Concord.   |
| Earthquake  | Oct. 20, 1988           | Near Berlin, NH            | 4   |
| Earthquake  | January 3, 2011         | Northwest of Laconia       | 2.5   |
| Earthquake  | Aug. 23, 2011           | Virginia to New Hampshire  | 5.8   |
| Earthquake  | Oct. 16, 2012           | Maine                      | 4.0   |
| Earthquake  | Feb. 15, 2018           | East Kingston, NH area     | 2.7, no injuries or structural damage reported.   |
| Earthquake  | March 19, 2018          | Concord, NH area           | 2.9, no injuries or structural damage reported.   |
| SEVERE WINTER WEATHER – VERY HIGH RISK  |                         |                            |   |
| <p>Winter events include heavy snow and ice storms. Occasionally heavy snow will collapse buildings. Ice storms have disrupted power and communication services. These random events make it difficult to set a cost to repair or replace any of the structures or utilities affected. The chart below is an indicator of the severity of ice storms and can assist emergency management officials in predicting the length of power outages based on wind speed and amount of ice accumulation during the storm. This index is similar to those that are used to predict the severity of tornados and hurricanes. Planning ahead will mitigate the damage and prepare communities for severe ice events days in advance.</p> |                         |                            |   |



**The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009**

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

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

**SEVERE WINTER WEATHER - Cont.**

| Hazard     | Date                 | Location      | Comments   |
|------------|----------------------|---------------|--|
| Ice Storm  | December 17-20, 1929 | New Hampshire | Unprecedented disruption and damage to telephone, telegraph, and power system. Comparable to 1998 Ice Storm (below). |
| Blizzard   | February 14-17, 1958 | New Hampshire | 20-30 inches of snow in parts of NH.   |
| Snow Storm | March 18-21, 1958    | New Hampshire | Up to 22 inches of snow in south central NH.   |
| Snow Storm | December 10-13, 1960 | New Hampshire | Up to 17 inches of snow in southern NH.  |
| Snow Storm | January 18-20, 1961  | New Hampshire | Up to 25 inches of snow in southern NH.  |
| Snow Storm | February 2-5, 1961   | New Hampshire | Up to 18 inches of snow in southern NH.  |
| Snow Storm | January 11-16, 1964  | New Hampshire | Up to 12 inches of snow in southern NH.  |
| Blizzard   | January 29-31, 1966  | New Hampshire | Third and most severe storm of 3 that occurred over a 10-day period. Up to 10 inches of snow across central NH.      |

| SEVERE WINTER WEATHER - Cont. |                      |   |   |
|-------------------------------|----------------------|---|---|
| Hazard                        | Date                 | Location  | Comments  |
| Snow Storm                    | December 26-28, 1969 | New Hampshire   | Up to 41 inches of snow in west central NH.   |
| Snow Storm                    | February 18-20, 1972 | New Hampshire   | Up to 19 inches of snow in southern NH  |
| Snow Storm                    | January 19-21, 1978  | New Hampshire   | Up to 16 inches of snow in southern NH.   |
| Blizzard                      | February 5-7, 1978   | New Hampshire   | New England-wide. Up to 25 inches of snow in central NH.  |
| Snow Storm                    | February, 1979       | New Hampshire   | President's Day storm.  |
| Ice Storm                     | January 8-25, 1979   | New Hampshire   | Major disruptions to power and transportation.  |
| Snow Storm                    | April 5-7, 1982      | New Hampshire   | Up to 18 inches of snow in southern NH.   |
| Ice Storm                     | February 14, 1986    | New Hampshire   | Fiercest ice storm in 30 yrs in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to New London.   |
| Extreme Cold                  | Nov-Dec, 1988        | New Hampshire   | Temperature was below 0 degrees F for a month.  |
| Ice Storm                     | March 3-6, 1991      | New Hampshire   | Numerous outages from ice-laden power lines in southern NH.   |
| Snow Storm                    | 1997                 | New Hampshire   | Power outages throughout Nelson due to heavy snowfall.  |
| Ice Storm                     | January 15, 1998     | New Hampshire   | Federal disaster declaration DR-1199-NH, 20 major road closures, 67,586 without electricity, 2,310 without phone service, \$17+ million in damages to Public Service of NH alone.   |
| Ice Storm                     | 2004                 | New Hampshire   | Ice storm resulted in treacherous travel throughout town.   |
| Snow Storm                    | 2006                 | New Hampshire   | Power outages throughout Nelson due to heavy snowfall.  |
| Ice Storm                     | December 8, 2008     | New Hampshire   | Power outage in Nelson for 9-21 days; downed power lines, restricted access to homes, significant amount of downed timber.  |
| Snow Storm                    | October 29-30, 2011  | Hillsborough and Rockingham Counties  | FEMA Disaster Declaration # DR-4049. \$3,337,545. Severe snowstorm event. Snowfall 34" in a 24 hour period.   |
| Snow Storm                    | Feb. 8-11, 2013      | Sullivan, Cheshire, Hillsborough, Rockingham, Merrimack, Belknap, Carroll, and Strafford Counties, NH | FEMA Disaster Declaration # DR-4105 \$6,153,471 statewide. Severe winter storm and snowstorm. No impact on Town services except for snow removal.   |
| Snow Storm                    | November 2014        | New Hampshire   | "Thanksgiving Storm"- was declared the 4 <sup>th</sup> largest power outage in NH history. Many communities received over 12" of snow. Locally- no injuries or structural damage. No impact on Town services except for snow removal. |

**SEVERE WINTER WEATHER - Cont.**

| Hazard     | Date              | Location   | Comments  |
|------------|-------------------|--|---|
| Snow Storm | Jan. 26-29, 2015  | Hillsborough, Rockingham, and Strafford Counties, NH | FEMA Disaster Declaration # DR-4209; \$4,939,215. Severe winter storm and snowstorm. No local impact. |
| Snow Storm | March 14-15, 2017 | Belknap, Carroll Counties, NH                        | FEMA Disaster Declaration # DR-4316 \$2,169,538; no local impact.                                     |
| Snow Storm | March 13-14, 2018 | Carroll, Rockingham, and Strafford Counties, NH      | FEMA Disaster Declaration # DR-4371 \$1,747,381; no local impact.                                     |

**RADON-VERY LOW RISK**

The committee was not aware of any records of illness attributed to radon. However, Nelson residents should be aware that radon is present. Houses with granite and dirt cellars are at increased risk. Below is a table showing the radon levels in each county of New Hampshire. The data indicates that all of the New Hampshire Counties have a higher average than the national average.

| State of New Hampshire 2011** Average Radon Levels (per county) |                |                  |            |
|---|----------------|------------------|------------|
| County  | County Average | National Average | Difference |
| Belknap   | 2.6 pCi/L      | 1.3 pCi/L        | 1.3 pCi/L  |
| Carroll   | 8.8 pCi/L      | 1.3 pCi/L        | 7.2 pCi/L  |
| Cheshire  | 3.3 pCi/L      | 1.3 pCi/L        | 2.0 pCi/L  |
| Coös  | 8.8 pCi/L      | 1.3 pCi/L        | 7.2 pCi/L  |
| Grafton   | 4.5 pCi/L      | 1.3 pCi/L        | 3.2 pCi/L  |
| Hillsborough  | 5.3 pCi/L      | 1.3 pCi/L        | 4.0 pCi/L  |
| Merrimack   | 5.1 pCi/L      | 1.3 pCi/L        | 3.8 pCi/L  |
| Rockingham  | 5.6 pCi/L      | 1.3 pCi/L        | 14.3 pCi/L |
| Strafford   | 6.2 pCi/L      | 1.3 pCi/L        | 4.9 pCi/L  |
| Sullivan  | 2.2 pCi/L      | 1.3 pCi/L        | .9 pCi/    |

Source: Table and information from the NH State Hazard Mitigation Update 2013

**Picocuries Per Liter pCi/L**): A unit of measure for levels of [radon gas](#); becquerels per cubic meter is the metric equivalent-

\*\*In 2011 NH State Legislature cut the NH Radon Program; this is the last updated information available

**HAZARDOUS MATERIALS SPILLS-HIGH RISK**

Transportation of chemicals and bio-hazardous materials through town on NH 9 by truck is a concern. There is limited history of hazardous materials spills in Nelson. In the Spring of 2016, a utility truck lost oil and transmission fluid on NH Rt. 9. No other documented incidents. There have been no injuries or structural damage as a result of this hazard.

**MAN-MADE HAZARDS, DAMS-VERY LOW RISK**

The State of New Hampshire classifies dams into the following four categories:

- |                 |                        |                    |
|-----------------|------------------------|--------------------|
| NM - Non-menace | S - Significant hazard | Blank - Non-Active |
| L - Low hazard  | H - High hazard        |                    |

Detailed description of classification terms:

**Non-Menace structure** means a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is:

- Less than six feet in height if it has a storage capacity greater than 50 acre-feet;
- less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.

**Low Hazard structure** means a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:

- No possible loss of life;
- low economic loss to structures or property;
- structural damage to a town or city road or private road accessing property other than the dam owner’s that could render the road impassable or otherwise interrupt public safety services;
- the release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than 2 acre-feet and is located more than 250 feet from a water body or water course;
- and reversible environmental losses to environmentally-sensitive sites.

**Significant Hazard structure** means a dam that has a significant hazard potential because it is in a location and of a size that failure or mis-operation of the dam would result in any of the following:

- No probable loss of lives;
- major economic loss to structures or property;
- structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services;
- major environmental or public health losses, including one or more of the following:
  - Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair.
  - The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more.
  - Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.

**High Hazard** means a dam that has a high hazard potential because it is in a location and of a size that failure or mis-operation of the dam would result in probable loss of human life as a result of:

- Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions;
- water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot;
- structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services;
- the release of a quantity and concentration of material, which qualify as “hazardous waste” as defined by RSA 147-A:2 VII;
- any other circumstance that would more likely than not cause one or more deaths.

Generally, all Class H dams need to have Emergency Action Plans, and most Class S dams also require them. According to the Department Of Environmental Services Dam Bureau, there is one Class H dam in Nelson, and one Class S. The table shows all dams in the Town of Nelson. There have been no incidents of dam failure or breach since the previous plan.

| <b>Dam ID #</b> | <b>Haz. Class</b> | <b>Status</b> | <b>Name</b>               | <b>River</b>       | <b>Height</b> | <b>Impound</b> | <b>Dam Owner</b> |
|-----------------|-------------------|---------------|---------------------------|--------------------|---------------|----------------|------------------|
| D166001         | L                 | Active        | Center Pond Dam           | TR Otter Brook     | 6             | 34             | Private          |
| D166002         | H                 | Active        | Granite Lake Dam          | Granite Lake Brook | 11            | 211            | Private          |
| D166003         | L                 | Active        | Spoonwood Pond Dam        | TR Nubansit Brook  | 12            | 167            | Private          |
| D166004         | S                 | Active        | Nubansit Dam              | Nubansit Brook     | 16            | 733            | Private          |
| D166005         | ---               | Ruins         | Otter Brook               | Otter Brook        | ---           | ---            | Unknown          |
| D166006         | NM                | Active        | Farm Pond                 | Unnamed Stream     | 10            | 0.25           | Private          |
| D166007         | NM                | Active        | Fire Pond                 | Unnamed Stream     | 14            | 0.33           | Private          |
| D166008         | L                 | Active        | Bunce Recreation Pond Dam | Runoff             | 13            | 3.3            | Private          |

Source: NHDES Dam Bureau 12/14/17

## Chapter 4

### Assessing Probability, Severity & Risk

#### Vulnerability and Risk Assessment

The vulnerability and risk assessment provides information to enable the Town to identify and prioritize appropriate mitigation actions to reduce losses from the identified hazards. For each hazard type shown in the table below, the committee assigned a value (1-5) to reflect the human, property and business impact of each hazard to determine the vulnerability. Then, the committee assigned a probability value (1-5) reflecting the likelihood that this hazard will occur in the next 25 years. The severity and risk was calculated from the inputted values. The final column indicates the risk of each hazard, allowing the committee to see which hazards pose the greatest risk to the community. Very Low to Very High risk was assigned as shown below.

#### Human Impact, Property Impact, Business Impact and Probability Rating



| Potential Hazard         | Human Impact                   | Property Impact             | Business Impact         | Probability                            | Severity                                     | Risk                   | Risk Level |
|--------------------------|--------------------------------|-----------------------------|-------------------------|--|--|------------------------|------------|
|                          | Probability of death or injury | Physical losses and damages | Interruption of service | Likelihood this will occur in 25 years | Average of human, property, business impacts | Severity x Probability |            |
| Flooding                 | 1                              | 4                           | 5                       | 3                                      | 3.3  | 10                     | Low        |
| Drought                  | 1                              | 2                           | 4                       | 5                                      | 2.3  | 12                     | Medium     |
| Extreme Temperatures     | 3                              | 3                           | 4                       | 5                                      | 3.3  | 17                     | High       |
| Wild Fire                | 3                              | 4                           | 5                       | 5                                      | 4  | 20                     | High       |
| Lightning Strikes        | 2                              | 3                           | 5                       | 4                                      | 3.3  | 13                     | Medium     |
| Tornado/downburst/wind   | 4                              | 5                           | 5                       | 5                                      | 4.7  | 23                     | Very High  |
| Hurricane/tropical storm | 3                              | 5                           | 5                       | 4                                      | 4.3  | 17                     | High       |
| Earthquake               | 1                              | 1                           | 1                       | 1                                      | 1  | 1                      | Very Low   |
| Severe Winter Weather    | 4                              | 4                           | 5                       | 5                                      | 4.3  | 22                     | Very High  |
| Radon                    | 1                              | 1                           | 1                       | 1                                      | 1  | 1                      | Very Low   |
| HazMat Spills            | 4                              | 4                           | 4                       | 5                                      | 4  | 20                     | High       |
| Dam Failure              | 2                              | 3                           | 3                       | 2                                      | 2.7  | 5                      | Very Low   |

**Risk Level: 1-5 Very Low 6-10 Low 11-15 Medium 16-20 High 21-25 Very High**

## Chapter 5

### Potential Hazards: Estimating Potential Losses

The following is a list of natural and man-made disasters, and the areas that could be affected within the Town of Nelson. These hazards and locations were identified by the Hazard Mitigation Planning Committee.

#### Estimating Losses

In order to determine estimated losses due to natural and man-made hazards in Nelson, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. According to town records, the value of all structures in 2018, including exempt structures such as schools and churches, is \$69,825,600. The median value of a home in Nelson is \$246,900 according to the US Census 2012-2016 American Community Survey (ACS) five year estimates. The data below was calculated using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses.

#### Potential Hazards

##### **Flooding-Low Risk-see estimate of cost below**

Otter Brook - \$2,962,800: There are 12 residences and one school located along Otter Brook that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, an estimated cost of repairing or replacing these structures is \$2,962,800. There is some infrequent flooding from both spring runoff and heavy summer/fall rains, which can include damage to the road surface.

Old NH Route 9 - \$5,925,600: Approximately 24 structures and one school have the potential to be affected by flood waters in this area. Assuming 100% damage to 100% of the structures, an estimated cost of repairing or replacing these structures is \$5,925,600. There is some annual flooding from both spring runoff and heavy summer/fall rains, which can include damage to the road surface. There is also the annual repair and upkeep to the bridge and culverts.

Tolman Pond Rd - \$1,481,400: There are 6 residences located around Tolman Pond Road that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$1,481,400. It should be noted that most of these homes are assessed at three to four times the median home value. There is some annual flooding from both spring runoff and heavy summer/fall rains, which can include damage to the road surface.

Old Stoddard Road - \$4,938,000: There are 20 residences and one fire station located in this area that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$4,938,000. This location requires annual road repair due to spring storm patterns, plugged culverts during spring runoff and mud season.

Apple Hill Road - \$1,975,200: There are 8 residences located in this area that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$1,975,200. Additionally, 7 homes could be isolated if the road is flooded or washed out. Occasional road repair is required due to spring storm patterns, plugged culverts during spring runoff and mud season.

Brickyard Road-\$1,728,300: There are 7 residences located in this area that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$1,728,300. There is occasional flooding of the road due to accumulation of heavy rain and runoff. This can require repairs to fix the damaged road.

Cabot Road-\$987,600: There are 4 residences located in this area that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$987,600. There is occasional flooding of the road due to accumulation of heavy rain and runoff. This can require repairs to fix the damaged road.

Holt Farm Road-\$493,800: There are 2 residences located in this area that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$493,800. There is occasional flooding of the road due to accumulation of heavy rain and runoff. This can require repairs to fix the damaged road.

Granite Lake Road-\$3,950,400: There are 16 residences located in this area that have the potential to be affected by floodwaters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$3,950,400. There is occasional flooding of the road due to accumulation of heavy rain and runoff. This can require repairs to fix the damaged road.

Conrad Road-\$2,222,100: There are 9 residences located in this area that have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing these structures is \$2,222,100. There is occasional flooding of the road due to accumulation of heavy rain and runoff. This can require repairs to fix the damaged road.

**Drought-Medium Risk-No estimate of cost:** Drought will increase the risk of wildfire, especially in areas of high recreational use. As more timberland is set aside as non-harvested timberland, the potential for the risk of wildfire will increase.

- Some private wells may run dry;
- Minimal impact to town services;
- Forested areas with high fuel content have more potential to burn; and
- This is a townwide event.

**Extreme Temperatures-High Risk-No estimate of cost:** Elderly are at risk. Approximately 22% of the town population is 65 and over.

- Minimal impact to town services;
- Extreme heat can cause power outages and brown-outs due to the increased draw on the electrical usage of air conditioners; extreme cold can freeze pipes; and
- This is a town wide event.

**Wildfire-High Risk-No estimate of cost:** As timber harvesting is reduced, the wood roads are closed and debris builds up on the ground leaving the potential for wildfires to increase town-wide. Also, the ice storms of 1998 and 2008 left a significant amount of woody debris throughout Town that could fuel future forest fires. Hurricanes and severe wind events have also contributed to this risk.

- Entire town has minimal forest fire protection (dependent on on-call firefighters and problems with accessibility);
- Wildfires pose a risk of life and property loss as well as disruption of utility service.



**Earthquake-Very Low Risk-Estimate of cost \$3,491,280:** Moderate potential for serious damage in the village portion of town. Structures are mostly of wood frame construction. Assuming a moderate earthquake in Nelson resulting in 5% of structural damage throughout town, property losses could be estimated at \$3,491,280. This does not include the costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures.

- There is a potential for collapse of structures, roads and bridges;
- There is a potential for injury or death; and
- This could occur townwide.

**Radon Air/Water-Very Low Risk-No estimate of cost:** No known records of illness can be attributed to radon. However, Nelson residents should be aware that radon is present. Many granite and dirt cellars are at risk.

- There is a potential for injury or death;
- This could occur town wide.

**Tornado/Downburst/Severe Wind-Very High Risk-Estimate of cost-\$1,396,512:** Tornadoes are hard to predict where they will touch down and what path they will take, making it difficult to estimate potential damages. Assuming estimated damages to 10% of all structures with 20% damages could cost \$1,396,512. Buildings in Nelson have not been built to Zone 2, Design Wind Speed Codes.

- This could occur townwide, however, river corridors and hill tops are most susceptible;
- There is a potential for interruption of service, and damage to structures, roads and bridges; and
- There is a potential for injury or death.

**Hurricane/Tropical Storm-High Risk-Estimate of cost-\$4,887,792:** Nelson's location in southwestern New Hampshire reduces the risk of extremely high winds that are associated with hurricanes. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. With wind damage to 5% of the structures with 10% damage the estimated loss is \$3,491,280. Hurricanes can also cause flooding. Flood damage to 10% of the structures with 20% damage is estimated at \$1,396,512.

- This could occur townwide, however, river corridors and hill tops are most susceptible;
- There is a potential for interruption of service, and damage to structures, roads and bridges; and
- There is a potential for injury or death.

**Lightning Strikes-Medium Risk-No estimate of cost:** There have been some undocumented lightning strikes, but no record of cost. A higher number of lightning strikes have occurred along Lead Mine Road, Old Stoddard Road, and Merricon Road.

- There is a potential for interruption of service, and damage to structures; and
- There is a potential for injury or death.

**Severe Winter Weather-Very High Risk-No estimate of cost:** Occasionally heavy snow years will collapse buildings. Ice storms have disrupted power and communication services. Timber has been severely damaged. In recent history, Nelson has not recorded any loss of life due to the extreme winter weather. These chance events with random damage make it difficult to set a cost to repair or replace any of the structures or utilities affected.

- This could occur town wide;
- There is a potential for interruption of service, and damage to structures; and
- There is a potential for injury or death.

**Man-Made Hazards-Hazardous Materials-High Risk-No estimate of cost:** Potential spills or leakage from the transportation of chemicals and bio-hazardous materials carried through town on NH Rt. 9 by truck is a concern. However, this accident could occur anywhere in Town. A spill could cause water contamination or airborne pollutants to residents which may cause illness or death. The potentially high cost of clean-up after a property is contaminated can make the property unusable for years.

**Man-Made Hazards-Dams-Low Risk-Estimate of cost \$7,413,200:** The Nelson Hazard Mitigation Committee identified the following dams which would cause damage in the event of a dam breach. It should be noted that all dams in Nelson are privately held; there are no town or state dams.

- Flooding is a potential;
- There is a potential for interruption of service, and damage to structures; and
- There is a potential for injury or death.

Granite Lake Dam-Low Risk-\$6,425,600: This is a Class L or Low Hazard Dam as classified by the NH DES. There are approximately 24 structures, one school, and one telephone substation located in this area that have the potential to be affected by flood waters from a dam breach. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing is \$6,425,600.

Nubanusit Dam-Low Risk-\$987,600: This is a Class S or Significant Hazard Dam as classified by the NH DES. There are 4 residences located in this area that have been affected or have the potential to be affected by flood waters. Assuming 100% damage to 100% of the structures, the estimated cost of repairing or replacing is \$987,600. Flooding of the Nubanusit Dam area has occurred due to accumulation of heavy rain and runoff causing flooding of road and damage to the road surface. Occasional road repair is required due to spring storm patterns, plugged culverts during spring runoff and mud season.

## Chapter 6

### 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

#### **Critical Facilities Within Hazard Areas**

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding.

The Critical Facilities List for the Town of Nelson has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Nelson's Hazard Mitigation Committee 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 Team as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Nelson. The third category contains Facilities/Populations that the Committee 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.

#### **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 and man-made hazards.

##### **1. Emergency Operations Center**

Nelson Fire Station/Safety Complex - Old Stoddard Road

##### **2. Fire Station**

Munsonville Fire Station - Old NH Route 9

Nelson Fire Station/Safety Complex - Old Stoddard Road

##### **3. Dry Hydrant**

Old Stoddard Road

Nelson School - Old NH Route 9

##### **4. Emergency Fuel Station**

Nelson Fire Station/Safety Complex - Old Stoddard Road

##### **5. Emergency Electrical Power Facilities (generators)**

Nelson School - Old NH Route 9

Nelson Fire Station/Safety Complex - Old Stoddard Road

3 emergency portable generators

##### **6. Emergency Shelters**

Nelson School - Old NH Route 9

Nelson Fire Station/Safety Complex - Old Stoddard Road

**7. Evacuation Routes**

NH Route 9  
NH Route 123  
Nelson Road/Harrisville Road

**8. Bridges Located on Evacuation Routes**

Harrisville Road over Otter Brook  
NH 9 over Woods Road  
NH 9 over Conrad Road  
NH 9 over Old NH 9, Granite Lake Outlet  
NH 9 over Boys Camp Road

**9. Communications**

Telephone crossbox locations - Lead Mine Road and West Shore Road  
Cell tower - Old Stoddard Road

**Category 2-Non-Emergency Response Facilities**

The second category contains Non-Emergency Response Facilities that have been identified by the Team as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Nelson.

1. Town Offices<sup>7</sup> - Nelson Common 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 Care  
Shut-ins and disabled  
Mentally challenged  
Elderly  
Hearing impaired  
Sight impaired

2. **School/Library**

Nelson School - Old NH Route 9  
Nelson Public Library - Nelson Common Road

3. **Churches**

Nelson Congregational Church - Nelson Road  
Munsonville United Methodist - Old Route 9

4. **Historic Buildings/Sites**

Nelson Village - Nelson Congregational Church, Town Hall, Town Office (Old Brick Schoolhouse)  
Nelson Common Road

5. **Town Common** - Nelson Common Road

6. **Ball field** - Old Stoddard Road

7. **Apple Hill Center for Chamber Music** - Apple Hill Road

**Category 4-Potential Resources**

Contains facilities that provide potential resources for services or supplies.

- 1. Emergency Broadcast & Television: WKNE 103.7  
WMUR Channel 9  
WINK 96.9  
WLNH 98.3  
WLKZ 104.9
- 2. Amateur Ham Radios: Rick & Hope Lothrop  
Jim Wilder
- 3. Transportation: Buses-First Student in Keene  
Trucks-Local Contractors, National Guard, Keene
- 4. Beds, Cots, Blankets: National Guard  
Red Cross
- 5. Small/Heavy Equipment: Bud French-Backhoe, Excavators, & Tractors  
Dennis Dellagrega  
Barry Tolman  
John Bunce  
Troy Tucker  
Dan Prawdzik

**Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas**

| Hazard Type                    | Hazard Area                                     | Critical Facilities Affected                              | Evacuation Routes Affected               |
|--------------------------------|---|---|--|
| Road Washouts                  | Old NH Route 9                                  | Nelson School   | None                                     |
| Road Washouts                  | Old Stoddard Rd.                                | Fire Station, Fuel Station, Salt Storage & Police Station | Old Stoddard Rd. (S)                     |
| Road Washouts                  | Apple Hill Rd.                                  | None  | Apple Hill Rd. (T)                       |
| Tornado                        | Lead Mine Rd. & Old NH Route 9                  | None  | Lead Mine Rd. (T)                        |
| Lightning Strikes              | Lead Mine Rd., Old Stoddard Rd., & Merricon Rd. | None  | Lead Mine Rd. (T) & Old Stoddard Rd. (S) |
| Extreme Winter Weather - Icing | Old Stoddard Road, Lead Mine Rd., & Cabot Rd.   | None  | Old Stoddard Rd. (S) & Lead Mine Rd. (T) |
| Hazardous Materials            | NH Route 9                                      | None  | NH Route 9 (S)                           |
| Dam Failure                    | Granite Lake Dam                                | Nelson School   | None                                     |

(P) = Primary (S) = Secondary (T) = Tertiary

## Chapter 7

### Existing Mitigation Strategies & Proposed Improvements

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

#### Description of Existing Programs

- **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.
- **School Evacuation Plan**-Designated plan to evacuate the Nelson School in the event of an emergency or disaster addressing bussing, transportation routes (primary and alternative), traffic & crowd control, end destination and parental notification.
- **Town Warning System**-The town utilizes a townwide phone tree as a limited warning system to warn residents of natural hazards.
- **Local Road Design Standards**-Standards set by the town and the Highway Department to ensure a constant construction benchmark.
- **Local Bridge Maintenance Program**-The Road Agent monitors local town bridges and culverts. All bridges are inspected by the state yearly. The Town has never applied for State Aid Bridge (SAB) funds because it is felt that the state standards are excessive when considering the character of Nelson.
- **Code Enforcement**-The Board of Selectmen respond to complaints of code violations and delegate life safety code issues to the Fire Chief.
- **Health Officer**-Addresses health issues in Town by providing information on an as needed basis.
- **Building Code**-Nelson does not have Town-Adopted Building Codes, instead the International Building Codes which comprise the International Building Code, International Plumbing Code, International Mechanical Code, International Energy Conservation Code and National Electric Code are used.
- **Snow Plow Policy**-A Town Policy that is designed as a set of guidelines for the Highway Department and town personnel to follow during times of extreme winter weather.
- **Spill Prevention and Counter Measures Plan**-This plan is on hand with the Fire Department in the event that there is an incident. Personnel in the Fire Department receive regular training for handling hazardous materials spills.
- **Town Radio System**-The Police and Fire Departments have updated systems with good communication. The Highway Department has reasonable-to-good communication and should be upgraded.
- **Tree Maintenance**-The Town monitors and maintains trees along right of ways.
- **Town Capital Improvements Plan**-Each town department has its own capital reserve fund.
- **Mutual Aid**-Nelson receives fire and police assistance from Mutual Aid through Southwest New Hampshire Fire Mutual Aid (SWNHFMA) and the Keene Emergency Dispatch. Nelson has an agreement with its neighboring towns to share highway equipment and services.
- **Erosion and Sedimentation Plan**-The state has established plans for erosion and sediment control. A Soil Erosion and Sedimentation Control Plan is required by the Town for all major subdivisions and site plans.

- **Emergency Back-up Power**-The town has 2 generators for emergency back-up power located at the Fire Station/Safety Complex and the school. There are also 3 portable generators available.
- **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.
- **Safety Awareness**-Outreach to provide material and events when needed on safety related practices.
- **Storm-water Protection Plan**-Maintains ditches and culverts to ensure that storm-water is properly directed.
- **Forest Fire Protection**-Forest fire protection is provided on a townwide as needed basis.

**Existing Protection Matrix**

The Nelson Hazard Mitigation Committee has developed the summary matrix of existing hazard mitigation strategies presented below and 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 and/or enforcement of the strategy (Column 4), comments on the identified improvements or changes needed (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 Protection              | Area Covered | Responsible Local Agent  | Effectiveness (Poor, Avg, Good) | Comments   |
|----------------------------------|--------------|--|---------------------------------|--|
| Emergency Operations Plan        | Townwide     | Emergency Management Director  | Good                            | Update it on a continual five year basis. Recently updated in 2016.  |
| School Evacuation Plan           | School       | School Board   | Good                            | Evacuations procedures updated as needed.  |
| Town Warning System              | Townwide     | Police & Fire Chiefs, Cheshire County Mutual Aid Dispatch, & Sheriff's Dept. | Average                         | The current system is adequate for the existing population. Other methods may be needed if the population increases. |
| Local Road Design Standards      | Townwide     | Planning Board, Road Agent   | Good                            | These design standards should be updated as technology changes   |
| Local Bridge Maintenance Program | Townwide     | Road Agent   | Good                            | Continue inspections to maintain safety.   |
| Code Enforcement                 | Townwide     | Board of Selectmen, Fire Chief   | Good                            | Hiring a Code Enforcement Officer may be necessary if the need arises. No changes needed at this time.               |
| Health Officer                   | Townwide     | Health Officer   | Good                            | Stay current with classes to learn more about health related issues. No changes needed at this time.                 |
| Building Codes                   | Townwide     | Board of Selectmen   | Good                            | Update codes as needed.  |
| Shoreland Protection Program     | Townwide     | Planning Board/ Conservation Commission                                      | Good                            | Local shoreline set backs are more stringent than what is required by the state.                                     |

| Existing Protection                                | Area Covered                                       | Responsible Local Agent  | Effectiveness (Poor, Avg, Good) | Comments  |
|--|--|--|---------------------------------|---|
| Snow Plow Policy                                   | Townwide   | Road Agent   | Good                            | Policy is working, continue as is. No changes needed at this time.  |
| Spill Prevention Control and Counter Measures Plan | Townwide   | Fire Chief, Road Agent   | Good                            | Update plans as needed.   |
| Town Radio System                                  | Townwide   | Police & Fire Chiefs, Road Agent   | Good                            | Upgrades are sufficient, however there are a few dead spots. All departments can interact with each other. Upgrades should keep up as technology changes. |
| Tree Maintenance                                   | Townwide   | Road Agent, Eversource   | Average                         | Eversource and the town have a maintenance program but most roads are protected roads. Continue to trim limbs over roads and power lines.                 |
| Town Capital Improvements Plan                     | Townwide   | Board of Selectmen   | Good                            | No changes needed.  |
| Mutual Aid   | Townwide   | Fire Chief, Police Chief, Emergency Management Director, Road Agent, Selectmen | Good                            | Provides full assistance to Nelson Emergency Management Services/Highway Department. No changes needed.   |
| Erosion & Sedimentation plans                      | Townwide   | Planning Board, Board of Selectmen, Conservation Comm.                         | Unknown                         | Subdivision Regulations provide technical guidelines. No changes needed at this time.   |
| Emergency Back-up Power                            | Generators at Nelson School, Safety Building       | Emergency Management Director  | Average                         | All Town buildings should have generators.  |
| Town Master Plan                                   | Townwide   | Planning Board   | Average                         | The Master Plan should be updated.  |
| Wetlands Protection                                | Protect wetlands townwide                          | DES & Conservation Commission  | Average                         | Outreach and education to the public will help to reduce violations.  |
| Safety Awareness                                   | Townwide   | Board of Selectmen   | Average                         | Continue to address safety issues. No changes needed at this time.  |
| Mass Inoculation Plan                              | Tri-town   | Emergency Management Director  | Good                            | The current plan has been adopted. No changes are needed at this time.  |
| Storm Water Protection                             | Townwide   | Road Agent   | Good                            | Continue to provide maintenance to ditches and culverts.  |
| Forest Fire Protection                             | Townwide   | Forest Fire Warden   | Good                            | Need more money for training.   |
| Other Mutual Aid                                   | Police & highway assistance from outside resources | Police Dept. & Road Agent  | Good                            | Mutual aid works well and should continue.  |



**Status of Previous Mitigation Actions**

The following table provides a status update for the Priority Mitigation Actions identified in the original plan:

| <b>Mitigation Strategy</b>   | <b>Status</b>       | <b>Explanation of Status</b>   |
|--|---------------------|--|
| Increase forest fire protection training.  | Completed & ongoing | Continue into this updated action plan.  |
| Invite a representative from NHOSI to explain the NFIP Program to the Board of Selectmen and the Planning Board. | Deferred            | Continue as new mitigation action.   |
| Update School Evacuation Plan.   | Deferred            | Evacuation routes have been changed and more work is in progress. Continue as new action.                    |
| Install new generator at Town Office to provide emergency back-up power.   | Deferred            | Continue into this updated action plan.  |
| Place Federal and State general hazard brochures at Town Hall.   | Completed & ongoing | Continue as a new mitigation action with wording change.   |
| Hold a workshop for all public officials on wetlands protection.   | Deleted             | Not enough interest from public officials.   |
| Purchase & install dry hydrants.   | Completed & ongoing | Continue as a new mitigation action with wording change.   |
| Obtain a sign for fire warning/danger levels.  | Deferred            | Continue into this updated action plan.  |
| Determine Health Officer roles and responsibilities.   | Completed           | No changes needed at this time.  |
| Explore including protection of 1st, 2nd, and 3rd order streams to strengthen existing Shoreland Protection Act. | Deleted             | Not enough interest to change the ordinance. The Town will continue to use the State requirements.           |
| Review culvert sizes & locations for all roads.  | Deferred            | The town will consider a road/stream culvert inventory by SWRPC.   |
| Draft and adopt an appropriate floodplain development ordinance for Nelson.                                      | Deleted             | The committee determined that flooding is a low risk in town and there is little support for new ordinances. |

## Chapter 8

### Existing & Potential Mitigation Strategies

#### Identifying Gaps in Coverage

The Hazard Mitigation Committee held a brainstorming session to help determine mitigation projects. The Committee used the following objectives:

- Preventative (Programs & Policies)
- Property Protection
- Emergency Services
- Public Education & Information

In addition to the programs and activities that Nelson is currently undertaking to protect its residents and property from natural and manmade disasters, a number of additional strategies were identified by the Local Hazard Mitigation Committee for consideration. The process of compiling a comprehensive list of all mitigation strategies currently in place throughout the town helped the committee to identify gaps in the existing coverage and improvements which could be made to the strategies. Existing and potential strategies were identified for each general hazard type using the following categories: Prevention (programs and policies), Property Protection, Emergency Services, and Public Information. Each strategy was discussed to determine realistic strategies to be included in the STAPLEE chart (see pp. 37-38.)

**Alternative Actions Brainstorm Table**

| Hazard Type                 | Prevention  | Property Protection   | Emergency Services                          | Public Information   |
|-----------------------------|---|---|---|--|
| <b>Flooding</b>             | Annual bridge and road maintenance program.                 | Upsize culverts and bridges as needed.                                    | Update and adopt Emergency Operations Plan. | Provide information to residents on flood proofing/elevating homes in flood prone areas.                                     |
| <b>Drought</b>              | Contact the elderly and special needs populations.          | Consider adding water conservation regulation and water ban if necessary. | Assess fire ponds and other water sources.  | Provide information to residents on water conservation/drought resistant landscaping and/or rain gardens.                    |
| <b>Extreme Temperatures</b> | Contact the elderly and special needs populations.          | -----   | Provide a cooling center.                   | Provide information to residents on ways to mitigate the impact of extreme heat to maintain health.                          |
| <b>Wild Fires</b>           | Clear out underbrush; establish BMPs for timber harvesting. | Install dry hydrants.   | Continue training for firefighters.         | Use existing information produced by the State and Urban Interface. Increase fire awareness by using a Smokey Bear sign.     |
| <b>Lightning</b>            | _____   | Install grounding equipment on public & historic buildings.               | -----                                       | Provide outreach material on safety during lightning and storm events. Include a link of FEMA's website on the town website. |

| <b>Hazard Type</b>                               | <b>Prevention</b>  | <b>Property Protection</b>  | <b>Emergency Services</b>  | <b>Public Information</b>  |
|--|--|---|--|--|
| <b>Tornados/<br/>Severe Wind/<br/>Downbursts</b> | Coordinate with Eversource to trim tree branches near power lines. | Trim tree branches near critical facilities, town structures, and roadways. | Continue mutual aid pacts with surrounding communities to share resources  | Provide information for residents to understand ways to mitigate potential damage during a tornado/severe wind/downbursts.   |
| <b>Hurricanes/<br/>Tropical Storms</b>           | Coordinate with Eversource to trim tree branches near power lines. | Consider requirement for new construction to withstand severe wind speeds.  | Continue mutual aid pacts with surrounding communities to share resources. | Provide information for residents to understand ways to mitigate potential damage during a hurricane/tropical storm event.   |
| <b>Earthquakes</b>                               | -----  | Retrofit public buildings with earthquake standards.                        | Continue mutual aid pacts with surrounding communities to share resources. | Provide information to the public about reducing damage due to earthquakes. Include a link of FEMA's website on the town website.  |
| <b>Severe Winter Weather</b>                     | Coordinate with Eversource to trim tree branches near power lines. | Trim tree branches near critical facilities, town structures, and roadways. | Review current and future needs for emergency backup power.                | Disseminate information to residents about proper use of generators and the importance of maintaining the heating system to prevent carbon monoxide poisoning and fires.                               |
| <b>Radon</b>                                     | Conduct regular radon tests in all public buildings.               | -----   | -----  | Disseminate information to the public about radon testing (air & water).   |
| <b>Hazardous Materials</b>                       | Spill Prevention Control and Counter Measures Plan.                | -----   | Annual reporting to Fire Department of local hazardous material storage.   | Disseminate outreach material on proper disposal of hazardous household materials and medicines; provide notification to residents for the Nelson hazard materials days at the Keene Transfer Station. |
| <b>Dams</b>                                      | Check dams, bridges and culverts prior to heavy rain events.       | Identify beaver dam eradication options.                                    | Dam Emergency Action Plans.  | Provide information to the public on emergency evacuation routes.  |
| <b>All Hazards</b>                               | School Emergency Plan.   | -----   | Annual training for fire, police, and public works staff and volunteers.   | Update Town website to include links to NHHSEM and FEMA.   |

### **Proposed Mitigation Strategies Prioritized**

Each proposed mitigation strategy identified in the previous section was analyzed and ranked in order to determine a prioritized list of strategies to implement.

**STAPLEE** is an acronym for a general set of criteria common to public administration officials and planners. It stands for the Social, Technical, Administrative, Political, Legal, Economic and Environmental criteria for making planning decisions. Questions to ask about suggested actions include:

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

Each mitigation strategy will be evaluated and assigned a score (Good = 3, Average = 2, Poor = 1) based on the STAPLEE criteria. The committee will fill in the table on the following page to reach a total score. Each strategy will be prioritized according to the total score. The highest scoring strategies are determined to be of most importance, economically, socially, technically, administratively, politically, legally, economically and environmentally.

## STAPLEE CHART Mitigation Strategies Prioritized

| <b>Mitigation Strategy</b>  | Is it <b>Socially</b> acceptable? | Is it <b>Technically</b> feasible & potentially successful? | Is it <b>Administratively</b> workable? | Is it <b>Politically</b> acceptable? | Is there <b>Legal</b> authority to implement? | Is it <b>Economically</b> beneficial? | Is it <b>Environ-mentally</b> beneficial? | Total Score |
|---|-----------------------------------|---|---|--------------------------------------|---|---------------------------------------|---|-------------|
| Increase forest fire protection training  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Work with SWRPC to perform a culvert inventory of road/stream crossings.  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Place outreach material for natural hazards at the Town Office and/or add information to the website. Include links to the FEMA and NHHSEM website. | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Replace the Baily Brook Bridge on Old Stoddard Road.  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Obtain a sign for fire warning/danger levels.   | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Invite a representative from NH Office of Strategic Initiatives to explain the NFIP program to the Board of Selectmen and Planning Board.           | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Install new generator at Town Hall to provide emergency back-up power.  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Update the Master Plan  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Update the School Evacuation Plan and include evacuation routes. (2017)   | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Determine locations and install dry hydrants  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Update the Emergency Operation Plan.  | 3                                 | 3   | 3                                       | 3                                    | 3   | 3                                     | 3   | 21          |
| Obtain an agreement from the school to use the school as an emergency shelter.  | 3                                 | 3   | 2                                       | 3                                    | 3   | 3                                     | 3   | 20          |
| Consider adding Town Hall as an emergency shelter.  | 3                                 | 2   | 3                                       | 3                                    | 2   | 3                                     | 3   | 19          |

## Chapter 9

### Implementation Schedule & Action Plan

The Hazard Mitigation Committee 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 the 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?

Each strategy's total score from the ranking process is included in the table. As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

#### Implementation Schedule for Priority Mitigation Actions-Summary Chart

In the *When* column: Short-term is 1-2 years; Mid-term is 2-3 years; Long-term is 4-5 years

| Mitigation Action   | Who (Leadership)              | When (Deadline) | How (Cost and Funding Source)           |
|---|-------------------------------|-----------------|---|
| Increase forest fire protection training.   | Fire Warden                   | Short term      | Grants/Town budget<br>\$5,000           |
| Work with SWRPC to perform a culvert inventory of road/stream crossings.  | Road Agent                    | Short term      | Grants<br>\$5,000-\$10,000              |
| Place outreach material for natural hazards at the Town Office and/or add information to the website. Include links to the FEMA and HSEM website. | Emergency Management Director | Short term      | Grants<br>Under \$200                   |
| Replace the Baily Brook Bridge on Old Stoddard Road.  | Road Agent                    | Long term       | Grants/Town budget<br>\$1,000,000       |
| Obtain a sign for fire warning/danger levels.   | Town Administrator            | Short term      | Grants/Town budget<br>\$2,000-\$5,000   |
| Invite a representative from NHOSI to explain the NFIP program to the Board of Selectmen and Planning Board.                                      | Emergency Management Director | Long term       | Grants<br>Under \$200                   |
| Install new generator at Town Hall to provide emergency back-up power.  | Board of Selectmen            | Long term       | Grants/Town budget<br>\$20,000-\$25,000 |

| <b>Mitigation Action</b>   | <b>Who (Leadership)</b>             | <b>When (Deadline)</b> | <b>How (Cost and Funding Source)</b>    |
|--|-------------------------------------|------------------------|---|
| Update the Master Plan.  | Planning Board                      | Long term              | Grants/Town budget<br>\$20,000-\$30,000 |
| Update the School Evacuation Plan and include evacuation routes. (2017)        | School Principal                    | Short term             | Town budget \$1,500                     |
| Determine locations and install dry hydrants.                                  | Fire Chief                          | Mid term               | Town budget<br>\$30,000-\$50,000        |
| Update the Emergency Operation Plan. (2017 last update)                        | Emergency Management Director       | Long term              | Grants<br>\$10,000                      |
| Obtain an agreement from the school to use the school as an emergency shelter. | Board of Selectmen/<br>School Board | Long term              | Town budget<br>\$500                    |
| Consider adding Town Hall as an emergency shelter.                             | Emergency Management Director       | Long term              | Grants/Town budget<br>\$10,000-\$50,000 |

## Chapter 10

### Adoption, Implementation, Monitoring & Update

#### Adoption

The Nelson Board of Selectmen adopted the Nelson Hazard Mitigation Plan Update 2019 on February 13, 2019. 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 9 and in the “Monitoring & Updates” sub-section contained in this Chapter (10). All other sections of this Plan are supporting documentation for information purposes only and are not included as the statement of policy.

#### 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 10), the Town Hazard Mitigation Committee will revisit the Nelson Hazard Mitigation Plan Update 2019 annually, or after a hazard event. The Emergency Management Director is responsible for initiating this review and needs to consult with the Board of Selectmen 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 STAPLEE, 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 be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation. In keeping with the process of adopting the Nelson Hazard Mitigation Plan Update 2019, a public viewing period to receive public comment on Plan maintenance and updating should be held during the annual review period and the final product adopted by the Board of Selectmen.

The Nelson Hazard Mitigation Plan Update 2019 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval every **five years** in order to maintain eligibility for all Hazard Mitigation Assistance (HMA) funding. This update was prepared with assistance from Planners at Southwest Region Planning Commission 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.

**FEMA final approval granted on March 8, 2019. The Nelson Hazard Mitigation Plan Update 2019 must be updated within five years of this date.**

#### Continued Public Involvement

In keeping with the process of adopting the Nelson Hazard Mitigation Plan Update 2019, the Emergency Management Director, under direction of the Board of Selectmen will be responsible for ensuring that the Town Departments and the public have adequate opportunity to participate in the maintenance and update of the Hazard Mitigation Plan. A public viewing period will be held to receive public comment during the annual review period, and the final product adopted by the Board of Selectmen.



During the maintenance, implementation, monitoring, evaluation and update process of the Nelson Hazard Mitigation Plan Update 2019, the following techniques may be used to ensure continued public involvement:

- Provide invitations to the Board of Selectmen;
- Provide invitations to the Town department heads;
- Notice on the Town Website;
- Post on social media and interactive websites;
- Post notices of meetings at the Town Office, Library, and the Town website.

### **Implementation of the Plan with Existing Programs**

The previous Nelson Hazard Mitigation Plan was used as a template to update this plan. It has also been used to update the Emergency Operations Plan.

To best implement the Nelson Hazard Mitigation Plan Update 2019, there should be coordination of some of the Action Plan items into other documents. Some of the Action Plan items from the previous Nelson Hazard Mitigation Plan have been deferred into this plan since they were not completed during that time period.

### **Master Plan**

Implementation of the Master Plan has been ongoing since its most recent adoption. Recommendations from the Nelson Hazard Mitigation Plan Update 2019 should be considered for insertion into future updates of the Master Plan. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to encourage the adoption of the Nelson Hazard Mitigation Plan Update 2019 as a chapter or appendix of the Master Plan.

### **Zoning Ordinance and Regulations**

Occasionally, implementation strategies involve revisions to the Subdivision Regulations and/or the Site Plan Review Regulations as well as the Zoning Ordinance. As these occur, the Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to develop appropriate language for the recommended modifications.

**NELSON, NEW HAMPSHIRE**  
**BOARD OF SELECTMEN**  
**A RESOLUTION ADOPTING THE**  
**NELSON HAZARD MITIGATION PLAN UPDATE 2019**

WHEREAS, the Town of Nelson has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2019 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between July 17 and October 30, 2018 regarding the development and review of the Nelson Hazard Mitigation Plan Update 2019; and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Nelson, 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 Nelson eligible for funding to alleviate the impacts of future hazards; now, therefore, be it RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Nelson;
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 Nelson this 13 day of February 2019



David Updegraff  
Nelson Board of Selectmen Chairman

Mary Gibbs  
Board of Selectmen

Corey Brown  
Board of Selectmen

ATTEST Edith C. Drinkwater, Notary

EDITH C. DRINKWATER  
Notary Public - New Hampshire  
My Commission Expires April 11, 2023

## Appendix A

### Hazard Descriptions

The following list describes hazards that have occurred or have the potential to occur in the Town of Nelson. The descriptions provided are those used in the State of NH Hazard Mitigation Plan.

#### **Flooding**

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges. Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to go.

#### *100-year Floodplain Events*

- Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term 100-year flood does not mean that a flood will occur once every 100 years. Rather, 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 of flood.” What this means is that there is a 1% chance of a flood of that size happening in a year.

#### *Rapid Snow Pack Melt*

- Warm temperatures and heavy rains cause rapid snowmelt. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

#### *River Ice Jams*

- Rising waters in early spring breaks ice into chunks, which float downstream and often pile up, causing flooding. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice collecting in river bends and against structures presents significant flooding threats to bridges, roads, and the surrounding lands.

#### *Severe Storms*

- Flooding associated with severe storms can inflict heavy damage to property. Heavy rains during severe storms are a common cause of inland flooding.

#### *Beaver Dams and Lodging*

- Flooding associated with beaver dams and lodging can cause road flooding or flooding damage to property.

#### **Drought**

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are rare in New Hampshire. They generally are not as damaging and disruptive as floods and are more difficult to define. The effect of droughts is indicated through measurements of soil moisture, groundwater levels, and stream-flow. However, not all of these indicators will be minimal during a drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground-water levels or increasing stream-flow. Low stream-flow correlates with low ground-water levels because ground-water discharge to streams and rivers maintains stream flow during extended dry periods. Low stream-flow and low ground-water levels commonly cause diminished water supply.

### **Extreme Temperatures**

Extreme temperatures are a prolonged period of extreme hot or cold temperatures that pose a danger to people, animals, and crops. Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures and often coincide with high relative humidity. Although it is an infrequent event, it usually occurs on an annual basis between late July and August. The severity of extreme heat can be dangerous to those residents with medical conditions and the elderly. Extreme heat can add to the potential for wildfires and depletion of the water supply for firefighting. Extreme cold temperatures are characterized by periods of abnormally cold temperatures and are especially dangerous to the elderly and those who are exposed to the weather for extended periods. Power outages can lead to frozen pipes and loss of heat.

### **Wildfire**

Wildfire is defined as an uncontrolled and rapidly spreading fire. A forest fire is an uncontrolled fire in a woody area. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. Grass fires are uncontrolled fires in grassy areas.

### **Earthquake**

New England is considered a moderate risk earthquake zone. An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric, water and phone lines, and often cause landslides, flash floods, fires, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and Mercalli scale.

### **Tornado, Downburst, Severe Wind**

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

Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage.

The Enhanced Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison to a hurricane, a tornado covers a much smaller area but can be more violent and destructive.

**Severe Wind:** Significantly high winds occur especially during tornadoes, hurricanes, winter storms and thunderstorms. Falling objects and downed power lines are potential hazards associated with high winds. In addition, property damage and downed trees are common during severe wind occurrences.

**Downburst:** A severe, localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories:

- Microburst, which covers an area less than 2.5 miles in diameter, and

- Macroburst, which covers an area at least 2.5 miles in diameter.

### **Hurricane/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 while the storm may extend over 400 miles. High winds and flooding are primary causes of hurricane-inflicted loss of life and property damage. A tropical storm is a downgraded form of a hurricane with slower wind speeds.

### **Lightning**

Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the sun. Fires are a likely result of lightning strikes, and lightning strikes can cause death, injury, and property damage.

### **Radon**

Radon is a naturally occurring radioactive gas with carcinogenic properties. The gas is a common problem in many states, including New Hampshire. Data collected by the NH Office of Community and Public Health's Bureau of Radiological Health indicates that one third of the houses in New Hampshire have indoor radon levels that exceed the U.S. Environmental Protection Agency's "action level" of four Pico curies per liter for at least some portion of the year. Radon may also enter homes dissolved in drinking water from drilled wells. A higher level of radon in water from individual drilled wells is a common occurrence in New Hampshire.

### **Severe Winter Weather**

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

Heavy Snow Storms: A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are defined as a storm which contains large amounts of snow OR blowing snow, with winds in excess of 35 mph and visibilities of less than 1/4 mile for an extended period of time (at least 3 hours). A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.

Ice Storms: An ice storm involves rain, which freezes on impact. Ice coating at least one-fourth inch of thickness is heavy enough to damage trees, overhead wires and similar objects. Ice storms often produce widespread power outages.

Nor'easter: A Nor'easter is a large weather system traveling from South to North passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic winds impact the coast and inland areas from a Northeasterly direction. The sustained winds may meet or exceed hurricane force, with larger bursts, and may exceed hurricane events by many hours (or days) in terms of duration.

### **Man-Made Hazards**

Hazardous Materials: Hazardous materials spills or releases can cause damage of 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.

Dam Breach and Failure: Dam failure results in rapid loss of water that is normally held by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property.

## Appendix B

### Risk Assessment

The following terms are used to analyze the hazards considered. *Very Low, Low, Medium, High, or Very High* correlate with 1, 2, 3, 4 and 5, respectively.

#### **Vulnerability**

An adjective description (Very Low, Low, Medium, High, and Very High) of the potential impact a hazard could have on the town relating to human, business and property impacts. It is the ratio of population, property, commerce, infrastructure and services at risk relative to the entire town. Vulnerability is an estimate generally based on a hazard's characteristics, information obtained by the various town departments.

**Very Low (1):** Little or no area or segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of minor proportions.

**Low (2):** A limited area or segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of minor to moderate proportions.

**Medium (3):** (1) The total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard of moderate influence; or (2) the total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard, but not all to the same degree; or (3) an important segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of moderate proportions.

**High (4):** The total population, property, commerce, infrastructure and services of the town are exposed to some effects of a hazard of potentially moderate to great magnitude. In a worst case scenario there could be a disaster of major proportions.

**Very High (5):** The total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard of potentially great magnitude. In a worst case scenario there could be a disaster of major to catastrophic proportions.

#### **Probability of Occurrence**

An adjective description (Very Low, Low, Medium, High, and Very High) of the probability of a hazard impacting the town within the next 25 years. Probability is based on a limited objective appraisal of a hazard's frequency using information provided by relevant sources, observations and trends.

**Very Low (1):** There is very little likelihood that a hazardous event will occur within the next 25 years (1 event in 25 years), however, the potential still exists.

**Low (2):** There is little likelihood that a hazardous event will occur within the next 25 years (1 event in 25 years).

**Medium (3):** There is moderate likelihood that a hazardous event will occur within the next 25 years (1-2 events each 5-10 years).

**High (4):** There is good likelihood that a hazardous event will occur within the next 25 years (1-2 events within 5 years).

**Very High (5):** It is highly likely that a hazardous event will occur within the next 25 years (1-2 events each year).

**Severity**

Calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

**Risk Level**

An adjective description (Very Low, Low, Medium, High, or Very High) of the overall threat posed by a hazard over the next 25 years. It is calculated by multiplying the probability of occurrence and vulnerability. The result is then compared to a scale from 1-25 to determine the level of risk for each hazard.

**Very Low (1-5):** There is very little potential for a disaster during the next 25 years. The threat is so minor that it warrants no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

**Low (6-10):** There is little potential for a disaster during the next 25 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 need not be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

**Medium (11-15):** There is moderate potential for a disaster of less than major proportions during the next 25 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 (16-20):** (1) There is moderate to strong potential for a disaster of major proportions during the next 25 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 25 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 town's emergency management training and exercise program.

**Very High (21-25):** (1) There is strong potential for a disaster of major proportions during the next 25 years; or (2) history suggests the occurrence of multiple disasters of moderate to severe proportions during the next 25 years. The threat is significant enough to warrant serious program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a priority focus of the town's emergency management training and exercise program.

## Appendix C

### Resources Used in the Preparation of this Plan

HSEM’s *State of New Hampshire Multi-Hazard Mitigation Plan Update 2018*  
 FEMA’s *Understanding Your Risks: Identifying Hazards and Estimating Losses*  
 FEMA’s *Local Multi-Hazard Mitigation Planning Guidance*  
 Town of Nelson, NH’s *Hazard Mitigation Plan (2013)*  
 Nelson Town Report (2017)  
 Town of Nelson Master Plan

|   |              |
|---|--------------|
| <b>New Hampshire Homeland Security and Emergency Management (HSEM):</b> ..... | 271-2231     |
| Field Representative Hillsborough County.....                                 | 271-2231     |
| Field Representative Cheshire County.....                                     | 271-2231     |
| <b>Federal Emergency Management Agency (FEMA)</b> .....                       | 877-336-2734 |
| <b>NH Regional Planning Commissions:</b>                                      |              |
| Central NH Regional Planning Commission .....                                 | 226-6020     |
| Lakes Region Planning Commission .....  | 279-8171     |
| Nashua Regional Planning Commission .....                                     | 424-2240     |
| North Country Council .....   | 444-6303     |
| Rockingham Planning Commission .....  | 778-0885     |
| Southern New Hampshire Planning Commission .....                              | 669-4664     |
| Southwest Region Planning Commission .....                                    | 357-0557     |
| Strafford Regional Planning Commission .....                                  | 994-3500     |
| Upper Valley Lake Sunapee Regional Planning Commission .....                  | 448-1680     |
| <b>NH Executive Department:</b>   |              |
| Governor’s Office of Energy and Community Services .....                      | 271-2611     |
| <b>NH Department of Cultural Resources:</b> .....                             | 271-2540     |
| Division of Historical Resources .....  | 271-3483     |
| <b>NH Department of Environmental Services:</b> .....                         | 271-3503     |
| Air Resources .....   | 271-1370     |
| Air Toxins Control Program.....   | 271-0901     |
| Asbestos Program.....   | 271-1373     |
| Childhood Lead Poisoning Prevention Program.....                              | 271-5733     |
| Environmental Health Tracking Program.....                                    | 271-4072     |
| Environmental Toxicology Program .....  | 271-3994     |
| Health Risk Assessment Program.....   | 271-6909     |
| Indoor Air Quality Program.....   | 271-3911     |
| Occupational Health and Safety Program.....                                   | 271-2024     |
| Radon Program.....  | 271-4764     |
| Geology Unit .....  | 271-3503     |
| Pollution Preventive Program.....   | 271-6460     |
| Waste Management .....  | 271-2900     |
| Water Supply and Pollution Control .....                                      | 271-3414     |
| Rivers Management and Protection Program .....                                | 271-8801     |
| <b>NH Office of Strategic Initiatives (OSI):</b> .....                        | 271-2155     |
| Jennifer Gilbert, State Coordinator, Floodplain Management .....              | 271-1762     |
| <b>NH Municipal Association</b> .....   | 224-7447     |
| <b>NH Fish and Game Department:</b> .....                                     | 271-3421     |
| Region 1, Lancaster .....   | 788-3164     |
| Region 2, New Hampton .....   | 744-5470     |
| Region 3, Durham.....   | 868-1095     |
| Region 4, Keene .....   | 352-9669     |



**NH Department of Business and Economic Affairs:**  
 Economic Development.....271-2591  
 Travel and Tourism .....271-2665

**NH Department of Natural and Cultural Resources:**  
 Division of Forests and Lands .....271-2214  
 Division of Parks and Recreation .....271-3556

**NH Department of Transportation** .....271-3734

**Northeast States Emergency Consortium, Inc. (NESEC)**..... (781) 224-9876

**US Department of Commerce:** ..... (202) 482-2000  
 NOAA: National Weather Service; Gray, ME ..... (207) 688-3216

**US Department of the Interior:**..... 202-208-3100  
 US Fish and Wildlife Service .....225-1411  
 US Geological Survey .....225-4681  
 US Army Corps of Engineers ..... (978) 318-8087

**US Department of Agriculture:**  
 Natural Resource Conservation Service .....868-7581  
 Cheshire County, Walpole.....756-2988  
 Sullivan County, Newport .....863-4297  
 Hillsborough County, Milford ..... 673-2409 Ext. #4

**Mitigation Funding Resources**

404 Hazard Mitigation Grant Program (HMGP).....NH Homeland Security and Emergency Management  
 406 Public Assistance and Hazard Mitigation.....NH Homeland Security and Emergency Management  
 Community Development Block Grant (CDBG) .....NH HSEM, NH OSI, also refer to RPC  
 Dam Safety Program ..... NH Department of Environmental Services  
 Emergency Generators Program by NESEC<sup>‡</sup> ..... NH Homeland Security and Emergency Management  
 Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service  
 Flood Mitigation Assistance Program (FMAP) ..... NH HSEM, NH OSI  
 Flood Plain Management Services (FPMS) ..... US Army Corps of Engineers  
 Mitigation Assistance Planning (MAP) ..... NH Homeland Security and Emergency Management  
 Mutual Aid for Public Works ..... NH Municipal Association  
 National Flood Insurance Program (NFIP) <sup>†</sup> ..... NH OSI, NH HSEM  
 Power of Prevention Grant by NESEC<sup>‡</sup> .....NH Homeland Security and Emergency Management  
 Project Impact .....NH Homeland Security and Emergency Management  
 Roadway Repair & Maintenance Program(s).....NH Department of Transportation  
 Section 14 Emergency Stream Bank Erosion & Shoreline Protection ..... US Army Corps of Engineers  
 Section 103 Beach Erosion ..... US Army Corps of Engineers  
 Section 205 Flood Damage Reduction ..... US Army Corps of Engineers  
 Section 208 Snagging and Clearing ..... US Army Corps of Engineers  
 Shoreline Protection Program ..... NH Department of Environmental Services  
 Various Forest and Lands Program(s) ..... NH Department of Natural and Cultural Resources  
 Wetlands Programs ..... NH Department of Environmental Services

<sup>‡</sup>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>.

<sup>†</sup> 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 I Mitigation Planning Webliography**

Hazard Mitigation is sustained action taken to reduce or eliminate risk to people and their property from natural hazards over the longest possible term.

### **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>

Hilliard 2/20/2014, P. 2

### **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 Shake 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 p. 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 Open GIS 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 p. 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 Places**

<http://www.nps.gov/nr/about.htm>

**National Wetlands Inventory**

[http://www.fws.gov/wetlands/ICLUS Data for Northeast Region](http://www.fws.gov/wetlands/ICLUS>Data%20for%20Northeast%20Region)

[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>

**PlannersWeb - 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 p. 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 p. 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>

**IS-318: Mitigation Planning for Local and Tribal Communities:** Independent Study Course

<http://training.fema.gov/EMIWeb/IS/is318.asp>

## **Region I Mitigation Planning Contacts**

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Email: [josiah.neiderbach@fema.dhs.gov](mailto:josiah.neiderbach@fema.dhs.gov)

## **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.coast.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/gyx](http://www.weather.gov/gyx)

**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):** The SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would qualify for) to install mitigation measures. It 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.

Hilliard 2/20/2014 p. 8

<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 (NCRC):** Heavily involved in climate data in the NCA, it has 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.icleiusa.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>

Hilliard 2/20/2014 p. 9

[NEclimateUS.org](http://NEclimateUS.org)

**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 (NVOAD):** NVOAD 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/>

## Appendix D

### Hazard Mitigation Resource Profiles

The following are fact sheets about the various hazard mitigation grant programs.

#### 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. In a Water Resources Development Act, Congress 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 projects that reduce or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities that 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, which 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 PAS 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 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.

**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 on 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 in 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. Based on current Federal guidelines, flood damage reduction projects constructed by the Corps of Engineers must demonstrate 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 projects under the Section 205 Flood Damage Reduction program, the Section 22 Planning Assistance to States Program (PAS), 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 projects reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization and 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 PAS 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 and now 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, has a flow capacity of nearly 14 cubic feet per second and has 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 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, Wildlife Habitat Incentives Program, Wetland Reserve Program, Forestry Incentives Program, and Farmland Protection Program - which each 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 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 NHHSEM at the state level and having our 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 NHHSEM 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 this agency provides 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 our present program funding authorities. However, larger projects would require reimbursement for planning and design assistance.

**Equipment, Physical Facilities and Other Capabilities:** All of our field offices and the 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**

### **Contact:**

Edward S. Fratto, Executive Director: Phone: (781) 224-9876, Fax: (781) 224-4350  
E-Mail: [www.nesec.org](http://www.nesec.org)

**Address:** Northeast States Emergency Consortium  
1 West Water Street, Suite 205  
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 microbursts, forest fires, drought, lightning, blizzards and other forms of severe weather. Developed urban areas as well as developed waterfront property have increased the degree of risk from natural hazards.

### **Mitigation Programs**

**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. The NESEC HAZUS report provides an excellent starting point for communities wishing to utilize HAZUS to identify potential hazards. It 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 (NHHSEM). Communities interested in participating should contact NHHSEM.

**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 office of HSEM. Communities interested in participating should contact 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/hmgp/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

#### Nelson Hazard Mitigation Meeting

July 17, 2018

5:30 p.m.

Nelson Town Hall

Nelson, NH 03467

- I. Introductions and Overview of the Hazard Mitigation Plan Update
- II. Review of Previous Mitigation Actions
  - a. Review the list of actions listed in the current Hazard Mitigation Plan and determine if they need to continue into the update.
- III. Identification of Hazards
  - a. Determine the natural hazards that pose a threat to the town
  - b. Identify the past occurrences for each hazard
  - c. Identify areas of concern for potential hazards
- IV. Risk Assessment
  - a. Rate each hazard to determine the risk/vulnerability
- V. Next Meeting - Potential Date: August 14, 2018 at 5:30 p.m.

#### Nelson Hazard Mitigation Meeting # 1

July 17, 2018

#### SIGN – IN SHEET

| Name               | Title/affiliation          | Email  |
|--------------------|----------------------------|--|
| Maury Collins      | Board of Selectmen         | Mandmcollins2@yahoo.com  |
| Gary Robinson      | Board of Selectmen         | Grobinson541@gmail.com   |
| David Upton        | Board of Selectmen         |  |
| Richard Pratt      | Police Chief               |  |
| Edie Drinkwater    | Administrative Assistant   | <a href="mailto:execadmin@nelsonnh.us">execadmin@nelsonnh.us</a>   |
| Mike Tarr          | Road Agent                 |  |
| Dennis Dellagrecia | Emergency Management Dir.  |  |
| Mary Dellagrecia   | Emer. Management Dep. Dir. | <a href="mailto:Dellagrecia1@gmail.com">Dellagrecia1@gmail.com</a> |
| Andrew P. Ward     | Deputy Chief-Fire Dept.    | <a href="mailto:Ward1371a@gmail.com">Ward1371a@gmail.com</a>       |
| Jackie Chapman     | EMT, Emer. Management Dep. | Jbc2009@live.com   |

**Nelson Hazard Mitigation Committee**

**Nelson Safety Building  
50 Old Stoddard Road  
Nelson, NH 03467**

**August 14, 2018 at 5:30 p.m.**

**Agenda- Meeting 2**

- I. Identification of Hazards on map
  - a. Determine potential areas where hazards pose a threat
  - b. Identify the past occurrences for each hazard on the map
- II. Critical Facilities
  - a. Review and update the Critical Facilities listed in the existing plan
- III. Existing Mitigation Strategies and Proposed Improvements
  - a. Review the list of existing strategies and programs. Determine any needed improvements.
- IV. Hazard Mitigation Goals
  - a. Determine the goals for the updated hazard mitigation plan.
- V. Future Meeting Dates- September 18 and October 16 at 5:30 p.m.

**Nelson Hazard Mitigation  
Meeting # 2**

August 14, 2018

**SIGN – IN SHEET**

| Name               | Title/affiliation          | Email  |
|--------------------|----------------------------|--|
| Maury Collins      | Board of Selectmen         | Mandmcollins2@yahoo.com  |
| Andrew P. Ward     | Deputy Chief-Fire Dept.    | <a href="mailto:Ward1371a@gmail.com">Ward1371a@gmail.com</a>       |
| Reilly Pratt       |                            |  |
| Jackie Chapman     | EMT, Emer. Management Dep. | Jbc2009@live.com   |
| David Upton        | Board of Selectmen         |  |
| Gary Robinson      | Board of Selectmen         | Grobinson541@gmail.com   |
| Edie Drinkwater    | Administrative Assistant   | <a href="mailto:execadmin@nelsonnh.us">execadmin@nelsonnh.us</a>   |
| Dennis Dellagrecia | Emergency Management Dir.  |  |
| Mary Dellagrecia   | Emer. Management Dep. Dir. | <a href="mailto:Dellagrecia1@gmail.com">Dellagrecia1@gmail.com</a> |
| Mike Tarr          | Road Agent                 |  |
| Richard Pratt      | Police Chief               |  |
| Jeffrey Walter     | Fire Captain               |  |

**Nelson Hazard Mitigation Committee**

**Nelson Safety Building  
50 Old Stoddard Road  
Nelson, NH 03467**

**September 18, 2018**

**5:30 p.m.**

**Agenda- Meeting 3**

- I. Identify Gaps in Coverage
  - a. Review the existing coverage for mitigation strategies and determine if there are any gaps.
  
- II. Identify and Prioritize Mitigation Actions for Each Hazard
  - a. Identify specific locations that should be added to the Action Plan.
  - b. Use the STAPLEE Chart to identify and rank actions for each hazard.
  
- III. Prepare an Action Plan
  - a. Determine the *Who, When, and Funding Source* for each action identified in the STAPLEE Chart.
  
- IV. Future Meeting Date- October 30, 2018 at 5:30 (changed from October 16)

**Nelson Hazard Mitigation  
Meeting # 3**

September 18, 2018

**SIGN – IN SHEET**

| Name              | Title/affiliation          | Email  |
|-------------------|----------------------------|--|
| Jackie Chapman    | EMT, Emer. Management Dep. | Jbc2009@live.com   |
| Dennis Dellagreca | Emergency Management Dir.  |  |
| Mary Dellagreca   | Emer. Management Dep. Dir. | <a href="mailto:Dellagreca1@gmail.com">Dellagreca1@gmail.com</a> |
| Eddie Drinkwater  | Administrative Assistant   | <a href="mailto:execadmin@nelsonnh.us">execadmin@nelsonnh.us</a> |
| David Upton       | Board of Selectmen         |  |
| Gary Robinson     | Board of Selectmen         | Grobinson541@gmail.com   |
| Maureen Lord      | Fire & Rescue              | logmo@outlook.com  |
| Jason Walter      | Fire Chief                 |  |
| Maury Collins     | Board of Selectmen         | Mandmcollins2@yahoo.com  |
| Jeffrey Walter    | Fire Captain               |  |
| Andrew P. Ward    | Deputy Fire Chief          | <a href="mailto:Ward1371a@gmail.com">Ward1371a@gmail.com</a>     |
| Richard Pratt     | Police Chief               |  |



**Nelson Hazard Mitigation Committee**

**Nelson Safety Building  
50 Old Stoddard Road  
Nelson, NH 03467**

**October 30, 2018 at 5:30 p.m.**

**Agenda- Meeting 4**

- I. Review of the Draft Nelson Hazard Mitigation Plan Update.
  - a. Determine any edits that are needed.
- II. Discuss the next steps in the approval process and potential timelines.

**Nelson Hazard Mitigation  
Meeting # 4**

October 30, 2018

**SIGN – IN SHEET**

| Name              | Title/affiliation          | Email  |
|-------------------|----------------------------|--|
| Jackie Chapman    | EMT, Emer. Management Dep. | Jbc2009@live.com   |
| Mary Dellagreca   | Emer. Management Dep. Dir. | <a href="mailto:Dellagreca1@gmail.com">Dellagreca1@gmail.com</a> |
| Dennis Dellagreca | Emergency Management Dir.  |  |
| Edie Drinkwater   | Administrative Assistant   | <a href="mailto:execadmin@nelsonnh.us">execadmin@nelsonnh.us</a> |
| David Upton       | Board of Selectmen         |  |
| Gary Robinson     | Board of Selectmen         | Grobinson541@gmail.com   |
| Mike Tarr         | Road Agent                 |  |
| Maury Collins     | Board of Selectmen         | Mandmcollins2@yahoo.com  |
| Jeffrey Walter    | Fire Captain               |  |

## **Public Notice**

### **Nelson Hazard Mitigation Plan Update Review**

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A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from **November 26, 2018 thru December 10, 2018** at the Nelson Town Office during regular business hours or by going to the Town's web site at: [townofnelson.org](http://townofnelson.org)

Written comments may be addressed to Dennis Dellagrecia, Emergency Management Director, and mailed to: Nelson Town Office, 7 Nelson Common Road, Nelson, NH 03457 or by email to Lisa Murphy [lmurphy@swrpc.org](mailto:lmurphy@swrpc.org).

# **Public Notice**

**Selectmen's**

**Public Hearing**

**Wednesday**

**February 13, 2019**

**4:00 PM**

**Town Office**

**Old Brick Schoolhouse**

***To hear comment on the  
consideration of adoption by the  
Town of the updated Hazard  
Mitigation Plan.***



**FEMA**

MAR 19 2019

Whitney Welch  
State Hazard Mitigation Officer  
NH Department of Safety  
Homeland Security and Emergency Management  
33 Hazen Drive  
Concord, NH 03303

Dear Ms. Welch:

As outlined in the FEMA-State Agreement for FEMA-DR-4316, your office has been delegated the authority to review and approve local mitigation plans under the Program Administration by States Pilot Program. Our Agency has been notified that your office completed its review of the Nelson Hazard Mitigation Plan Update 2019 and approved it effective **March 8, 2019** through **March 7, 2024** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the National Flood Insurance Act of 1968, as amended, and Title 44 Code of Federal Regulations (CFR) Part 201.

With this plan approval, the jurisdiction is eligible to apply to New Hampshire Homeland Security and Emergency Management for mitigation grants administered by FEMA. Requests for mitigation funding will be evaluated according to the specific eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in your community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

The plan must be updated and resubmitted to the FEMA Region I Mitigation Division for approval every five years to remain eligible for FEMA mitigation grant funding.

Thank you for your continued dedication to public service demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Melissa Surette at (617) 956-7559 or [Melissa.Surette@fema.dhs.gov](mailto:Melissa.Surette@fema.dhs.gov).

Sincerely,

A handwritten signature in blue ink, appearing to read "Paul F. Ford".

Paul F. Ford  
Acting Regional Administrator

PFF: ms

cc: Fallon Reed, Chief of Planning, New Hampshire  
Kayla Henderson, Hazard Mitigation Planner, New Hampshire

Below are excerpts of some of the public outreach methods that were used to bring awareness, support, and public participation of the Nelson Hazard Mitigation update.

### Other Meetings

#### August 7

The Monadnock Alliance for Sustainable Transportation (MAST) Bicycle Friendly Community Subcommittee will meet at 4:30 p.m. at 37 Ashuelot Street in Keene, NH. For more information, please contact [Henry Underwood](#) of SWRPC staff.

#### August 14

The Nelson Hazard Mitigation Committee will meet at 5:30 p.m. at the Nelson Town Hall for the second meeting of the hazard mitigation plan update. For more information, please contact [Lisa Murphy](#) of SWRPC staff.

#### August 22

The Stoddard Hazard Mitigation Committee will meet at 6:30 p.m. at the Stoddard Fire Station to begin the hazard mitigation plan update. For more information, please contact [Lisa Murphy](#) of SWRPC staff.

Please register by **August 3rd** by emailing [Lindsay Taflas](#), at the Monadnock Conservancy or by calling (603) 357-0660, ext. 113.

### FCC Mobility Fund Phase II

Are there areas of your community that lack mobile voice and high speed internet coverage? The Federal Communications Commission (FCC) Mobility Fund Phase II will make up to \$4.53 billion available over 10 years to expand 4G Long Term Evolution service, primarily in rural areas. As part of this opportunity, the FCC established a Challenge Process to provide feedback on a map of eligible areas. Interested parties, including local governments have an opportunity to challenge an initial determination that an area is ineligible for support. This opportunity closes in late-November of this year. In New Hampshire, the Public Utilities Commission is assisting interested communities to coordinate their efforts to participate. In addition, SWRPC has created a [dedicated webpage](#) with information relevant to this process.

### Preventing Aquatic Invasive Species in Local Water Bodies

New Hampshire has been fighting exotic aquatic plants since the mid-1960's and these invasive species have spread to infest more than 60 water bodies in the state.

On **Wednesday, August 22nd** from 12:00 - 1:00 p.m. the New Hampshire Municipal Association (NHMA) will host a webinar on preventing aquatic invasive species in our local water bodies. Amy Smagula, Exotic Species Program Coordinator with the New Hampshire Department of Environmental Services along with Kelly Ainslee Buchanan, Advocacy Coordinator with NH LAKES, will discuss what cities and towns can do through

will meet at 9:00 a.m. at 57 Ashuelot Street in Keene. The MRCC will be voting on [proposed changes to its bylaws](#) at this meeting. These bylaws require that any changes to them be posted with a meeting notice. Please contact [J. B. Mack](#) of SWRPC staff, for more information.

**September 18**

The **Nelson Hazard Mitigation Committee** will meet at 5:30 p.m. at the Nelson Safety Building, 50 Old Stoddard Road, for the third meeting of the hazard mitigation plan update. The public is encouraged to attend and participate. For more information, contact [Lisa Murphy](#) of SWRPC staff.

**September 26**

The **Stoddard Hazard Mitigation Committee** will meet at 6:30 p.m. at the Stoddard Fire Station for the second meeting of the hazard mitigation plan update. The public is encouraged to attend and participate. Contact [Lisa Murphy](#) of SWRPC staff for more information.

**Quick Links**

Bridging differences is an essential step toward a more resilient future. In order to address current and impending impacts of climate change, we must work collaboratively. This means constructively engaging with organizations, communities, and individuals with unique histories, values, and cultures. In this session, you will practice frameworks and learn about case studies that can unlock our most creative responses to climate hazards, all of which are enabled by collaboration. Register [here](#).

**2021-2030 Ten Year Plan Project Solicitation**

Every two years, SWRPC requests feedback from local officials to reaffirm their support for already programmed transportation projects and/or to nominate new projects for consideration for inclusion in the New Hampshire Ten-Year Transportation Improvement Program (referred to as the "Ten Year Plan" or TYP). The most recently adopted TYP, along with other related materials are available at the [NHDOT website](#).

As the first step in the process of developing the 2021-2030 TYP, SWRPC has sent every municipal select board, planning board, police chief and road agent/public works official in the Southwest Region a letter asking for any transportation project nominations that they would like considered for the next TYP. *Happenings* readers are encouraged to contact their local municipal elected officials or municipal staff to discuss any project ideas. The deadline to respond with project nominations is **October 19th, 2018**. For more information, please contact [J. B. Mack](#) of Commission staff.

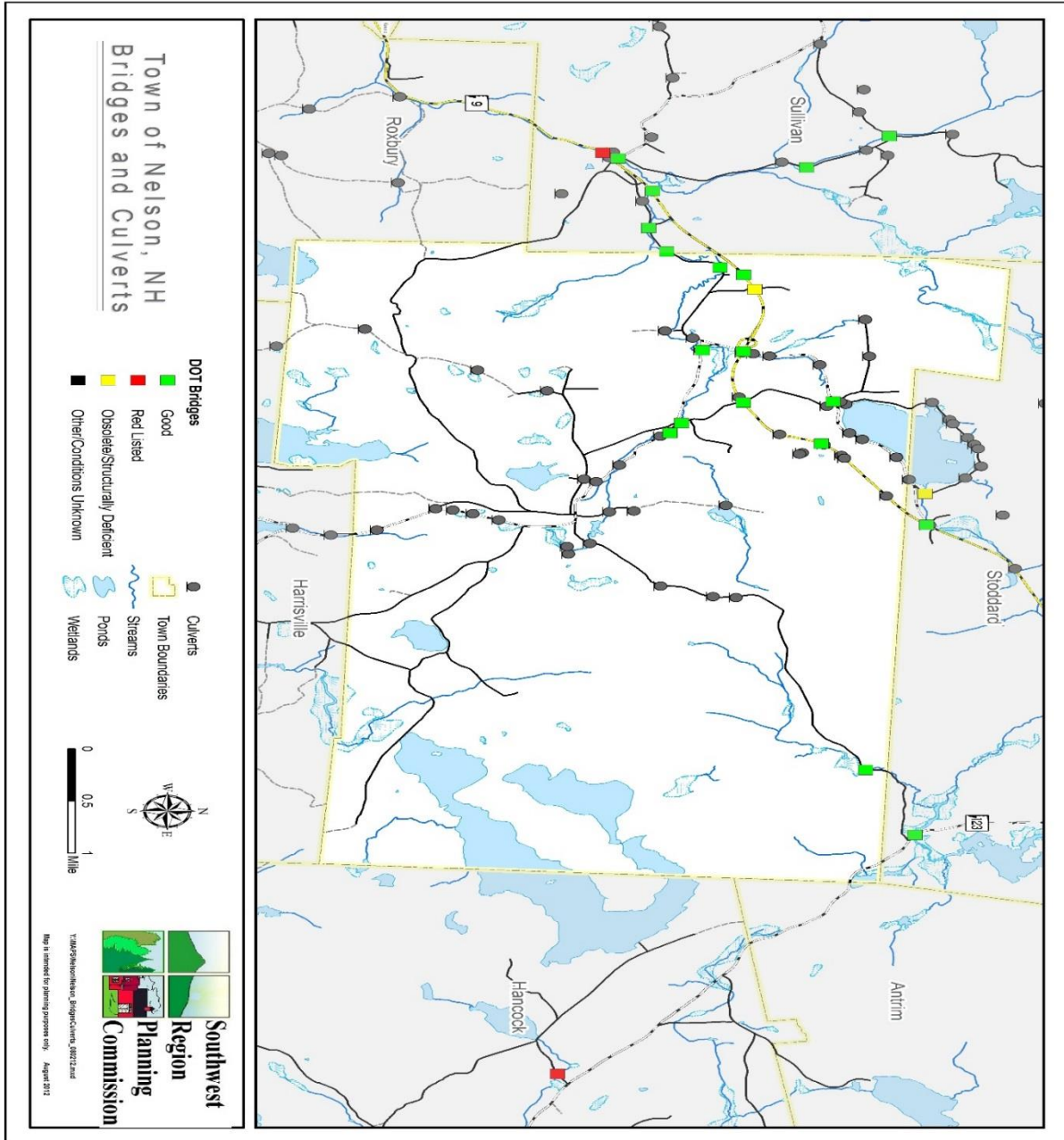
**Diesel Emissions Reduction Funding Opportunity**

The New Hampshire Department of Environmental Services (NHDES) will have funds available in October 2018 through the Environmental Protection Agency's (EPA) Diesel Emissions Reduction Act (DERA) program to help diesel equipment owners

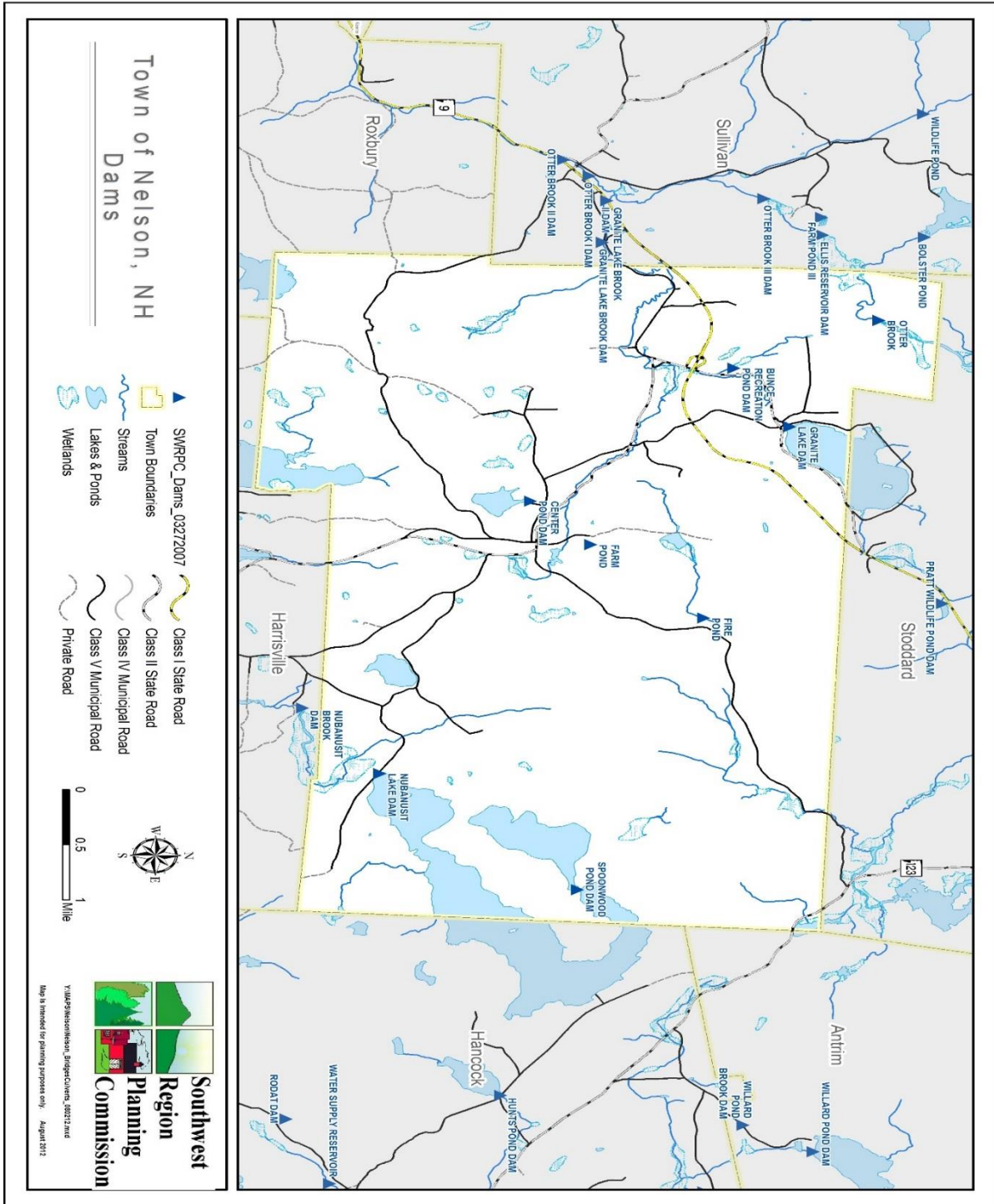
## Appendix F

### Town Maps

#### Bridges and Culverts in Nelson



# Dams in Nelson





**Appendix G**

**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. This will be beneficial for the next plan update.

| <b>MITIGATION ACTION</b> | <b>STATUS</b> | <b>EXPLANATION OF STATUS</b> |
|--------------------------|---------------|------------------------------|
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