

Town of Lyndeborough, New Hampshire

Hazard Mitigation Plan Update 2021



Date Approved Pending Adoption: February 12, 2021

Date Adopted: February 24, 2021

Date Final Approval: March 8, 2021

Prepared with Assistance from the Nashua Regional Planning Commission



Funded in part by the NH Department of Safety, Homeland Security and
Emergency Management



Table of Contents

CHAPTER 1. PLANNING PROCESS.....	4
Section 1.1 ~ Overview of Planning Process	4
Section 1.2 ~ Involvement of Neighboring Communities and Local/Regional Agencies	4
Section 1.3 ~ Public Participation	5
Section 1.4 ~ Existing and Potential Authorities, Policies, Programs, and Resources	5
Planning and Regulatory Capabilities	5
Emergency Management Capabilities	6
Emergency Management Departments, Facilities, Personnel, and Volunteers	7
Emergency Management Communications.....	7
Floodplain Management Capabilities	7
Administrative and Technical Capabilities	8
Fiscal Capabilities	8
Summary and Analysis of Lyndeborough’s Existing Authorities, Policies, Programs, and Resources ..	9
Section 1.5 ~ Review and Incorporation of Existing Documents	11
Section 1.6 ~ Updating the Plan.....	11
CHAPTER 2. CHANGES FROM PREVIOUS PLAN	12
Section 2.1 ~ Changes in Development	12
Section 2.2 ~ Progress on Local Mitigation Efforts	12
Table 1—Status of Previous Actions	13
Section 2.3 ~ Changes in Priorities.....	15
Table 2—Changes in Mitigation Priorities	17
CHAPTER 3. HAZARD IDENTIFICATION AND RISK ASSESSMENT	20
Section 3.1 ~ Description of Natural Hazards	20
Table 3—Natural Hazards in Jurisdiction	20
Section 3.2 ~ Description of Previous Hazards	24
Table 4—Previous Occurrences of Hazards in Jurisdiction	24
Section 3.3 ~ Probability of Future Hazard Events	45
Table 5—Probability of Future Hazard Events.....	45
Section 3.4 ~ Critical Facilities and their Vulnerability.....	51

Table 6.1—General Occupancy Critical Facilities	52
Table 6.2—Essential Facilities	53
Table 6.3—Transportation Critical Facilities	54
Table 6.4—Utility Systems	55
Table 6.5—High Potential Hazard Facilities	56
Table 6.6—Hazardous Materials Facilities	59
Section 3.5 ~ Vulnerability by Hazard	61
Climate Change	61
Drought	62
Earthquake	63
Extreme Temperatures	65
Flooding.....	66
Severe Wind	69
Lightning.....	71
Severe Winter Weather	72
Tornado/Downburst	74
Wildfire.....	75
Section 3.6 ~ Overall Summary of Vulnerability	77
Table 7.1—Overall Summary of Vulnerability by Hazard	77
Table 7.2—Overall Summary of Vulnerability by Facility Type.....	82
Section 3.7 ~ National Flood Insurance Program.....	82
Table 8—National Flood Insurance Program Mitigation Actions	83
CHAPTER 4 MITIGATION STRATEGY.....	84
Section 4.1 ~ Goals and Objectives to Reduce Vulnerabilities to Hazards	84
Section 4.2 ~ Mitigation Actions	86
Table 9—Mitigation Actions	86
Section 4.3 ~ Prioritizing Mitigation Actions.....	88
Table 10—Benefit Cost Review.....	88
Table 11—STAPLEE Analysis	91
Section 4.4 ~ Implementing and Administering Mitigation Actions.....	100
Table 12—Implementation and Administration.....	101
CHAPTER 5. PLAN ADOPTION	104

Section 5.1 ~ Formal Adoption by Governing Body	104
Section 5.2 ~ FEMA Approval Letter	106

CHAPTER 1. PLANNING PROCESS

Section 1.1 ~ Overview of Planning Process

The Lyndeborough Hazard Mitigation Plan Update 2021 was prepared by the Nashua Regional Planning Commission (NRPC) for the Town of Lyndeborough, NH. NRPC staff worked closely with the Lyndeborough Hazard Mitigation Team to write this plan. The Lyndeborough Hazard Mitigation Team includes:

- Russ Boland, Town Administrator, Town of Lyndeborough
- Mark Chamberlain, Board of Selectmen Chair, Town of Lyndeborough
- Brian Smith, Fire Chief/Emergency Management Director, Town of Lyndeborough
- Rainsford Deware, Police Chief, Town of Lyndeborough
- Donald Cole, Health Officer, Town of Lyndeborough

NRPC staff met with the Lyndeborough Hazard Mitigation Team for a series of 4 meetings in order to prepare the Lyndeborough Hazard Mitigation Plan Update 2021. Agendas from these meetings appear in the Appendix to this Plan. In between meetings, NRPC worked directly with Lyndeborough Hazard Mitigation Team members to obtain additional information needed to write the Plan.

The primary differences between the 2021 Plan and the 2015 Plan are 1) preparedness actions are not included in the 2021 Plan, 2) man-made hazards are not included in the 2021 Plan, and 3) climate change resiliency is addressed in the 2021 Plan.

Section 1.2 ~ Involvement of Neighboring Communities and Local/Regional Agencies

At the first Hazard Mitigation Team meeting, held on August 17, 2020, the group discussed who should be invited to participate on the planning team that was not currently represented. It was determined that the current Team provided adequate representation and no additional members were necessary. The Team also discussed who should be informed about the Plan, such as neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, and others. It was concluded that the following entities should be informed of the Plan update:

- Bill Hyde, TDS, Contoocook, NH
- Elizabeth LaRocca, Eversource, Manchester, NH
- American Red Cross, Concord, NH
- Souhegan Valley Community Emergency Response Team (CERT)
- Matthew S. Fish, Town of Wilton, NH Board of Selectmen
- John M. Esposito, Town of Mont Vernon, NH Board of Selectmen
- Gary Daniels, Town of Milford, NH Board of Selectmen
- Liz Gilboy, Homeland Security and Emergency Management, Field Representative, Concord, NH

A copy of the letter that was sent to these entities appears in the Appendix to this Plan. There was no response from any of the entities listed above.

Section 1.3 ~ Public Participation

During the first Hazard Mitigation Team meeting, August 17, 2020, the Team brainstormed all the methods currently employed to notify the public of Town meetings and news. These methods include the Town's website (<https://www.town.lyndeborough.nh.us/>), Fire Department Facebook account (<https://www.facebook.com/LyndeboroughFD>), and Police Department Facebook account (<https://www.facebook.com/LPDNH>). The Team determined that these methods should also be used to encourage public participation in the Hazard Mitigation Plan update process. There was no public response to provide input to the Lyndeborough Hazard Mitigation Plan Update 2021 process.

NRPC staff also developed a webpage for the Lyndeborough Hazard Mitigation Plan Update 2021 (<http://www.nashuarpc.org/energy-environmental-planning/hazard-mitigation-planning/>), which allows members of the public to participate in the update process even if they cannot attend meetings. The webpage was updated throughout the planning process and includes the 2021 Lyndeborough Hazard Mitigation Plan, 2021 Hazard Mitigation Plan Outline, and Hazard Mitigation Plan Review Checklist. It also provides meeting times, locations, agendas, and homework assignments. The Town of Lyndeborough's website links to this webpage. The Nashua Regional Planning Commission will keep the website active and will add information about ongoing updates over the next five years. A screen shot of the website appears in the Appendix to this Plan.

Section 1.4 ~ Existing and Potential Authorities, Policies, Programs, and Resources

At the first Hazard Mitigation Team meeting, held on August 17, 2020, the Team discussed Lyndeborough's existing authorities, policies, programs, and resources related to hazard mitigation and its ability to expand and improve on these. The purpose of this discussion was to determine the ability of the Town to implement its hazard mitigation strategies and to identify potential opportunities to enhance specific policies, programs, or projects. The evaluation of Lyndeborough's existing authorities, policies, programs, and resources includes planning and regulatory capabilities, emergency management capabilities, floodplain management capabilities, administrative and technical capabilities, and fiscal capabilities. Each of these areas provides an opportunity to integrate hazard mitigation principles and practices into the local decision-making process.

Planning and Regulatory Capabilities

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate Lyndeborough's commitment to guiding and managing growth in a responsible manner. The following is a summary of the relevant local plans, ordinances, and programs already in place in the Town of Lyndeborough. Each one should be considered as an available mechanism for incorporating the recommendations of the Lyndeborough Hazard Mitigation Plan Update 2021.

- Floodplain Management Ordinance—the purpose of this Ordinance is to reduce damage to properties within areas subject to periodic flooding and to comply with the requirements of the National Flood Insurance Act of 1968.

- [Wetlands District \(Section 1000\)](#)— the purpose of this Ordinance is to reduce damage to properties within areas subject to periodic flooding and to comply with the requirements of the National Flood Insurance Act of 1968.
- NH Fish & Game protected land in floodplain
- [Capital Improvements Plan](#)
- [Town of Lyndeborough, Land Use Laws, 2019 Zoning Ordinance](#)—the purpose of the Zoning Ordinance is to promote the health, safety, and general welfare of the residents by preserving the value of buildings and by encouraging the appropriate use of land throughout the Town.
- Lyndeborough Master Plan
- [Town of Lyndeborough, Land Use Laws, Excavation Site Plan Regulations](#)
- [Town of Lyndeborough, Land Use Laws, 2000 Non-Residential Site Plan Review Regulations](#)
- [Town of Lyndeborough, Land Use Laws, 2003 Subdivision Control Regulations](#)
- [Building Code](#) – 2020 International Building Code and International Residential Code
- [National Flood Insurance Program](#)
- [Nashua Region Water Resiliency Action Plan](#)— Climate change in southern New Hampshire will impact the environment, ecosystem services, economy, public health, and quality of life. According to a 2014 study by the Sustainability Institute at the University of NH, southern NH is expected to become warmer and wetter over the next century with more extreme precipitation events. This weather pattern puts significant stress on the region’s already aging water infrastructure. Furthermore, climate change is likely to cause a number of public health impacts on NH’s most vulnerable residents. Despite efforts taking place to slow the rate of climate change, some level of change is inevitable. Therefore, municipalities must make sound decisions to help their communities adapt to a new climate normal. The goal of the Nashua Region Water Resiliency Action Plan is to help municipalities become more resilient to the impacts that climate change has on their water infrastructure and vulnerable populations.
- Emergency Operations Plan

Emergency Management Capabilities

Hazard mitigation is a key component of emergency management, along with preparedness, response, and recovery. Opportunities to reduce potential losses through mitigation practices are typically implemented before a hazard event occurs, such as enforcement of policies to regulate development that is vulnerable to hazards due to its location or design. Existing emergency management capabilities for the Town of Lyndeborough include:

Emergency Management Plans

- [Lyndeborough Hazard Mitigation Plan 2015](#)—this document provides a guide for the community to reduce the impact of natural hazards on its residents and the built environment. It addresses natural hazards in the Town, previous occurrences of these hazards, the probability of future hazard events, and the vulnerability of Lyndeborough’s critical facilities to these hazards. The Hazard Mitigation Plan also identifies and prioritizes mitigation actions to reduce Lyndeborough’s vulnerability to natural hazards.

- Lyndeborough Emergency Response Plan—this document outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.
- Lyndeborough Central School Emergency Procedures Security Procedures—this document outlines preparedness measures and procedures for fire evacuation, off site evacuation, reverse evacuation, shelter in place, lockdown, bomb threat, medical emergency, 2 way radios, and safety.

Emergency Management Departments, Facilities, Personnel, and Volunteers

- [Lyndeborough Fire Department](#)
- [Lyndeborough Police Department](#)
- Police Mutual Aid—the Lyndeborough Police Department participates in a county-wide mutual aid agreement.
- Fire Mutual Aid—the Lyndeborough Fire Department participates in Southwest Mutual Fire Aid Association, based in Keene, NH. By participating in Southwest Mutual Fire Aid Association, Lyndeborough can receive and provide mutual aid to approximately 76 communities.
- [Lyndeborough Local Emergency Planning Committee](#)
- Emergency Operations Center at the Lyndeborough Fire Station
- Evacuation points at the Church, Fire Station, and Lyndeborough Central School
- Wilton-Lyndeborough Cooperative School District Safety-Joint Loss Management Committee
- Highway Safety Committee
- [Souhegan Community Response Team \(CERT\)](#)

Emergency Management Communications

- Dispatch—primary dispatch is through Milford Area Communications Center and Southwest NH Fire Mutual Aid.
- Nixle—connects public safety agencies to Lyndeborough residents via text, web, and email
- Code Red
- [Lyndeborough Fire Department Facebook](#) and [Lyndeborough Police Department Facebook](#)—emergency management announcements
- [Lyndeborough Town website](#)—emergency management announcements and education

Floodplain Management Capabilities

The Town of Lyndeborough participates in the National Flood Insurance Program (NFIP). This provides full insurance coverage based on risk as shown on detailed Flood Insurance Rate Maps (FIRMs).

Lyndeborough joined the NFIP on September 25, 2009. As a participant in the NFIP, communities must agree to adopt a floodplain management ordinance and enforce the regulations found in the ordinance. Lyndeborough has adopted the “Floodplain Management Ordinance,” which establishes a permit system and review procedure for development activities in the Town’s designated flood hazard areas.

Additional information on the Floodplain Management Ordinance and Lyndeborough’s participation in the NFIP can be found in Section 3.7 of this Plan.

Administrative and Technical Capabilities

Lyndeborough's ability to develop and implement mitigation projects, policies, and programs is closely related to the staff time and resources it allocates to that purpose. Administrative capability can be improved by coordinating across departments and integrating mitigation planning into existing Town procedures. The following departments, boards, and personnel are critical to Lyndeborough's hazard mitigation administrative and technical capabilities:

- Fire Department
- Police Department
- Road Agent
- Board of Selectmen
- Building Inspector
- Town Administrator
- Local Emergency Planning Committee
- Budget Committee
- Planning Board
- Zoning Board of Adjustment
- Capital Improvements Program (CIP) Committee

Fiscal Capabilities

In addition to administrative and technical capabilities, the ability of the Town of Lyndeborough to implement mitigation actions is closely associated with the amount of money available for these projects. Mitigation actions identified in this Plan, including those that will appear in Table 12—Implementation and Administration, may utilize the following funding sources.

- [Congestion Mitigation and Air Quality \(CMAQ\) Program](#)—this program is administered by the Federal Highway Administration and was implemented to support surface transportation projects and related efforts that contribute to air quality improvements and provide congestion relief.
- [FEMA Hazard Mitigation Grant Program](#)—the Hazard Mitigation Grant Program provides grants to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the Program 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.
- [FEMA Pre-Disaster Mitigation Program](#)—the Pre-Disaster Mitigation Program provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster.
- Community Development Block Grant Program—the Community Development Block Grant (CDBG) program, administered through the US Department of Housing and Urban Development, provides communities with resources to address a wide range of unique community development needs, including Disaster Recovery Assistance. HUD provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.
- [Lyndeborough Capital Improvements Plan](#) — The Capital Improvement Program is overseen by the Planning Board who appoints members to the committee. This financial planning tool has been in place since 1985. It is the process of reviewing the capital needs of the town and

developing a savings and spending plan so as to minimize severe swings in our capital costs. The overall goal of the plan is to fund these needs in a way that, from year to year, results in a minimal impact on the tax rate.

- One of the chief financial tools used to accomplish these results are Capital Reserve Funds or CRFs. These voter-established funds allow money to be set aside in an interest-bearing account that over time will provide sufficient funds to be available for a specific capital purchase. These funds are managed by the Trustees of Trust Funds and cannot be co-mingled with any other monies.
- The other primary funding tool is bonding. This approach is used when funding by a CRF is impractical given the size of the expense or the timeline involved.

Summary and Analysis of Lyndeborough's Existing Authorities, Policies, Programs, and Resources

Measures of Effectiveness are defined as follows:

- Excellent—the existing program works as intended and is exceeding its goals
- Good—the existing program works as intended and meets its goals
- Average—the existing program works as intended but could be improved to meet higher standards
- Poor—the existing program does not work as intended, often falls short of its goals, and/or may present unintended consequences

Capability	Description	Area of Town Covered	Responsible Entities	Effectiveness	Changes or Improvements Needed
Planning and Regulatory	Floodplain Management Ordinance, Wetlands District, Capital Improvements Plan, Zoning Ordinance, Site Plan and Subdivision Regulations, Building Code, Master Plan, NFIP	Entire jurisdiction	Planning Board, Zoning Board	Good	Ordinances should be reviewed on a regular basis to ensure they are consistent with goals outlined in the Master Plan and Hazard Mitigation Plan. Consider conducting a Town specific vulnerability assessment to improve local resiliency to climate change impacts.
Emergency Management	Plans; Departments,	Entire jurisdiction	Lyndeborough Fire Dept.,	Excellent	Utilize a variety of communications

	Facilities, Personnel, and Volunteers; Communications		Lyndeborough Police Dept., Lyndeborough Police Mutual Aid, Lyndeborough Fire Mutual Aid, Souhegan Community Response Team		methods to ensure all residents are educated about emergency preparedness and hazard mitigation measures they can take.
Floodplain Management	NFIP	Designated Flood Hazard Areas in Lyndeborough	Planning Board	Average	Develop a Floodplain Management Ordinance and Incorporate updated floodplains for Merrimack Watershed into municipal planning activities when they become available.
Administrative and Technical	Planning Board, Building Inspector, Fire Department, Health Officer, Road Agent, Police Department, Town Administrator, Board of Selectmen, ZBA, Budget Committee, School Dept. SAU 63, Local Emergency Planning Committee	Entire jurisdiction	Entities listed in Description	Good	Promote communication across all departments and committees to ensure Hazard Mitigation Plan goals and actions are implemented.
Fiscal	Grant funding, Lyndeborough annual budget, Capital Improvements Plan (CIP)	Entire jurisdiction	Board of Selectmen, Budget Committee, Planning	Good	Hazard mitigation actions should be considered for inclusion in the CIP and departmental

			Board, CIP Committee		budgets. Lyndeborough's Hazard Mitigation Plan should be updated at least every 5 years in order to maintain eligibility for FEMA grants.
--	--	--	-------------------------	--	---

Section 1.5 ~ Review and Incorporation of Existing Documents

A number of existing documents were reviewed and incorporated into the Lyndeborough Hazard Mitigation Plan Update 2021. The Lyndeborough Zoning Ordinance was used to provide information on where and how the Town builds. This was particularly helpful when mapping critical facilities corridors (Section 3.4). The Lyndeborough Capital Improvements Plan was used to help document the Town's fiscal capabilities (Section 1.4). The Lyndeborough Master Plan provided insight on future development patterns (Section 2.1) and helped to inform the analysis and prioritization of mitigation actions (Section 4.3). The Lyndeborough Emergency Operations Plan was also used to inform the analysis and prioritization of mitigation actions. The State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 provided insight when developing the description of natural hazards (Section 3.1), description of previous hazards (Section 3.2), probability of future hazards (Section 3.3), vulnerability by hazard (Section 3.5), and goals to reduce vulnerabilities (Section 4.1). The City of Nashua's Comprehensive Emergency Management Plan was referenced to write the hazard descriptions used to determine Lyndeborough's vulnerability by hazard (Section 3.5). Finally, the Nashua Regional Planning Commission's "Nashua Regional Water Resiliency Action Plan" provided insight when developing the description of natural hazards (Section 3.1), probability of future hazards (Section 3.3), vulnerability by hazard (Section 3.5), and goals to reduce vulnerabilities (Section 4.1). It was used to inform the analysis and prioritization of mitigation actions (Section 4.3).

Section 1.6 ~ Updating the Plan

The Town of Lyndeborough is required to update its Hazard Mitigation Plan at least every five years. In order to monitor, evaluate, and update the Mitigation Strategies identified in Table 12—Implementation and Administration, the Lyndeborough Hazard Mitigation Team will meet annually. The Lyndeborough Fire Chief is responsible for initiating this review and will consult with members of the Lyndeborough Hazard Mitigation Team and the community. During this meeting, the Team will identify mitigation actions that can be conducted in the current year as well as mitigation actions that will require budget requests for the following year. These mitigation actions will be monitored throughout the year by the Team.

Changes should be made to the Plan to accommodate projects that have failed or are not considered feasible after an evaluation and review for their consistency with the benefit cost analysis, STAPLEE analysis, timeframe, community's priorities, and funding resources. Mitigation strategies that were not

ranked as priorities during the 2021 update should be reviewed as well during the monitoring, evaluation, and update of this Plan to determine feasibility of future implementation. New mitigation actions or plans proposed upon adoption of this Plan should follow the benefit cost and STAPLEE analysis methods utilized in this Plan to ensure consistency with the adopted Plan and to help the Hazard Mitigation Team evaluate overall potential for success.

In addition to this annual meeting, the Hazard Mitigation Team will meet after any hazard occurrence as part of the Town's debriefing exercise. The Hazard Mitigation Plan will be updated following this meeting to reflect changes in priorities and mitigation strategies that have resulted from the hazard event. It is especially important to incorporate updates within one year after a Presidential Disaster Declaration.

The Town of Lyndeborough will utilize its website to notify members of the public about the annual Hazard Mitigation Plan Update meeting and to involve them in the update process. Any public input that is received will be incorporated into the Plan update. In addition, following its annual meeting, the Hazard Mitigation Team will report the results of its update process to the Lyndeborough Board of Selectmen. The Board of Selectmen's meetings are open to the public.

CHAPTER 2. CHANGES FROM PREVIOUS PLAN

Section 2.1 ~ Changes in Development

There have been no significant changes in development patterns in Lyndeborough since the 2015 Hazard Mitigation Plan. Likewise, there have been no significant changes in development that have occurred in hazard prone areas that have increased Lyndeborough's vulnerability to hazards. This is largely the result of a slowing economy and less new development coming into Lyndeborough.

Section 2.2 ~ Progress on Local Mitigation Efforts

The mitigation actions and implementation framework identified in the Lyndeborough Hazard Mitigation Plan Update 2021 have been revised to reflect progress in local mitigation efforts. Progress has been made on a number of local mitigation efforts identified in the 2015 Plan, including: Develop evacuation strategies that include provisions for animal rescue and evacuation, including arrangement of special transportation needs for large animals such as horses; Implement yearly heat-coil inspections and deploy trained maintenance personnel for roof snow-removal operations at Fire Station, School, and Highway Department; Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management; Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms; Conduct inspections of building safety. Establish a school survey procedure and guidance document to inventory structural and non-structural hazards in and around school buildings; Assist vulnerable

populations. Provide voluntary phone calls to at risk members of the community through the Wake Up Lyndeborough program. Voluntarily obtain medical information from vulnerable citizens for use during emergency situations; Stabilize erosion hazard areas. Use culvert assessment data to prioritize undersized and poorly aligned culverts for upgrades. Replace culvert on Johnson Corner Road with bridge and stabilize banks along Curtis Brook; Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station; Reduce impacts to roadways during severe winter weather events. Consider widening roadway where possible to allow safe passage of snowplows and vehicles. Continue to work with Eversource to harden electrical infrastructure, including trimming trees near power lines. Review scenic road designation to allow for more flexibility in tree trimming; and Establish emergency lanes on Class VI roads for the purpose of fire protection.

In order to assess progress on local mitigation efforts, the Hazard Mitigation Team reviewed the actions originally presented in the Lyndeborough Hazard Mitigation Plan 2015 and determined if they had been completed, deleted, or deferred. Progress on each action and its current priority level were also evaluated to determine if it should continue to be included in the mitigation actions identified in this Plan update.

Table 1—Status of Previous Actions

Mitigation Action	Status	Explanation
Develop evacuation strategies that include provisions for animal rescue and evacuation, including arrangement of special transportation needs for large animals such as horses.	Completed/Deleted	This is a preparedness action. As such, it will not be tracked in future hazard mitigation plans.
Implement yearly heat-coil inspections and deploy trained maintenance personnel for roof snow-removal operations at Fire Station, School, and Highway Department.	Completed/Deleted	This is a preparedness action. As such, it will not be tracked in future hazard mitigation plans.
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	Completed/Deleted	This is a preparedness action. As such, it will not be tracked in future hazard mitigation plans.
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Deferred	This is a mitigation action (Flooding, Property Protection). This action was not completed over the span of the 2015 Hazard Mitigation Plan and will be

Mitigation Action	Status	Explanation
		moved to the Hazard Mitigation Plan Update 2021.
Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.	Ongoing	<u>This is a mitigation action (Structural, Property Protection).</u> This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2021.
Conduct inspections of building safety. Establish a school survey procedure and guidance document to inventory structural and non-structural hazards in and around school buildings.	Completed/Deleted	This is a mitigation action. Because it has been completed, this action will not be tracked in future hazard mitigation plans.
Assist vulnerable populations. Provide voluntary phone calls to at risk members of the community through the Wake Up Lyndeborough program. Voluntarily obtain medical information from vulnerable citizens for use during emergency situations.	Completed/Deleted	This is a mitigation action. Lyndeborough completed this action over the span of the 2015 Hazard Mitigation Plan. This action will be deleted because the hazard mitigation plan would like to develop a new mitigation action regarding vulnerable populations in the 2021 update.
Install permanent gates on Cemetery Road (flood control) to prohibit vehicular traffic from passing during flood events.	Deleted	This is a preparedness action. As such, it will not be tracked in future hazard mitigation plans.
Map and assess vulnerability to erosion. Conduct stream assessments and prepare fluvial erosion hazard zone maps.	Deleted	Fluvial Erosion is no longer tracked in Hazard Mitigation Planning. This action will not be tracked in future hazard mitigation plans.
Stabilize erosion hazard areas. Use culvert assessment data to prioritize undersized and poorly aligned culverts for upgrades. Replace culvert on Johnson Corner Road with bridge and stabilize banks along Curtis Brook.	Completed/Deleted	Fluvial Erosion is no longer tracked in Hazard Mitigation Planning. This action will not be tracked in future hazard mitigation plans.
Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station.	Ongoing	<u>This is a mitigation action (Structural, Property Protection).</u> This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2021.

Mitigation Action	Status	Explanation
Reduce impacts to roadways during severe winter weather events. Consider widening roadway where possible to allow safe passage of snowplows and vehicles. Continue to work with PSNH to harden electrical infrastructure, including trimming trees near power lines. Review scenic road designation to allow for more flexibility in tree trimming.	Ongoing	<u>This is a mitigation action (Structural, Property Protection).</u> This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2021.
Establish emergency lanes on Class VI roads for the purpose of fire protection.	Completed/Deleted	This is a preparedness action. As such, it will not be tracked in future hazard mitigation plans.

Section 2.3 ~ Changes in Priorities

Many of the “mitigation” actions identified in Lyndeborough’s 2015 Hazard Mitigation Plan were actually preparedness actions. While preparedness actions are important, the Lyndeborough Hazard Mitigation Plan Update 2021 will focus exclusively on mitigation actions.

Table 2 depicts the change in STAPLEE scores of the 2015 mitigation actions and what their status is in the 2021 Plan update.

The following mitigation action rose in priority level from the 2015 Plan to the 2021 Plan:

- Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.
- Reduce impacts to roadways during severe winter weather events. Consider widening roadway where possible to allow safe passage of snowplows and vehicles. Continue to work with Eversource to harden electrical infrastructure, including trimming trees near power lines. Review scenic road designation to allow for more flexibility in tree trimming.

The following mitigation actions dropped in priority level from the 2015 Plan to the 2021 Plan:

- Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.

The following mitigation actions stayed the same in priority level from the 2015 Plan to the 2021 Plan:

- Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens’ Hall and Fire Station.

The following preparedness actions were no longer included in the 2021 Plan:

- Develop evacuation strategies that include provisions for animal rescue and evacuation, including arrangement of special transportation needs for large animals such as horses.
- Implement yearly heat-coil inspections and deploy trained maintenance personnel for roof snow-removal operations at Fire Station, School, and Highway Department.
- Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.
- Install permanent gates on Cemetery Road (flood control) to prohibit vehicular traffic from passing during flood events.
- Establish emergency lanes on Class VI roads for the purpose of fire protection.

The following mitigation actions were completed and/or deleted and will no longer be included in the 2021 Plan:

- Conduct inspections of building safety. Establish a school survey procedure and guidance document to inventory structural and non-structural hazards in and around school buildings.
- Assist vulnerable populations. Provide voluntary phone calls to at risk members of the community through the Wake Up Lyndeborough program. Voluntarily obtain medical information from vulnerable citizens for use during emergency situations.
- Map and assess vulnerability to erosion. Conduct stream assessments and prepare fluvial erosion hazard zone maps.
- Stabilize erosion hazard areas. Use culvert assessment data to prioritize undersized and poorly aligned culverts for upgrades. Replace culvert on Johnson Corner Road with bridge and stabilize banks along Curtis Brook.

Table 2—Changes in Mitigation Priorities

2015 Mitigation Action	Current Status	Priority Level in 2015 Plan	Priority Level in 2021 Plan
Develop evacuation strategies that include provisions for animal rescue and evacuation, including arrangement of special transportation needs for large animals such as horses.	Completed/Deleted	STAPLEE Score = 7 Rank = 5 out of 13	This action has been completed and is no longer considered a priority. A similar action was not identified in the 2021 Plan update.
Implement yearly heat-coil inspections and deploy trained maintenance personnel for roof snow-removal operations at Fire Station, School, and Highway Department.	Completed/Deleted	STAPLEE Score = 17 Rank = 1 out of 13	This action has been completed and is no longer considered a priority. A similar action was not identified in the 2021 Plan update.
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	Completed/Deleted	STAPLEE Score = 10 Rank = 4 out of 13	This action has been completed and is no longer considered a priority. A similar action was not identified in the 2021 Plan update.
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Deferred	STAPLEE Score = 4 Rank = 8 out of 13	STAPLEE Score = 4 Rank 10 out of 10
Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and	Ongoing	STAPLEE Score = 5 Rank = 7 out of 13	STAPLEE Score = 16 Rank = 1 out of 10

2015 Mitigation Action	Current Status	Priority Level in 2015 Plan	Priority Level in 2021 Plan
infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.			
Conduct inspections of building safety. Establish a school survey procedure and guidance document to inventory structural and non-structural hazards in and around school buildings.	Completed/Deleted	STAPLEE Score = 17 Rank = 1 out of 13	This action has been completed and is no longer considered a priority. A similar action was not identified in the 2021 Plan update.
Assist vulnerable populations. Provide voluntary phone calls to at risk members of the community through the Wake Up Lyndeborough program. Voluntarily obtain medical information from vulnerable citizens for use during emergency situations.	Completed/Deleted	STAPLEE Score = 0 Rank = 10 out of 13	Lyndeborough completed this action over the span of the 2015 Hazard Mitigation Plan. This action will be deleted because the hazard mitigation plan would like to develop a new mitigation action regarding vulnerable populations in the 2021 update.
Install permanent gates on Cemetery Road (flood control) to prohibit vehicular traffic from passing during flood events.	Deleted	STAPLEE Score = 3 Rank = 3 out of 13	This action is no longer considered a priority. A similar action was not identified in the 2021 Plan update.
Map and assess vulnerability to erosion. Conduct stream assessments and prepare fluvial erosion hazard zone maps.	Deleted	STAPLEE Score = 15 Rank = 2 out of 13	This action is no longer considered a priority. A similar action was not identified in the 2021 Plan update.
Stabilize erosion hazard areas. Use culvert assessment data to	Completed/Deleted	STAPLEE Score = 17 Rank = 1 out of 13	This action is no longer considered a priority. A similar action was not

2015 Mitigation Action	Current Status	Priority Level in 2015 Plan	Priority Level in 2021 Plan
prioritize undersized and poorly aligned culverts for upgrades. Replace culvert on Johnson Corner Road with bridge and stabilize banks along Curtis Brook.			identified in the 2021 Plan update.
Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station.	Ongoing	STAPLEE Score = 6 Rank = 6 out of 13	STAPLEE Score = 6 Rank = 6 out of 10
Reduce impacts to roadways during severe winter weather events. Consider widening roadway where possible to allow safe passage of snowplows and vehicles. Continue to work with PSNH to harden electrical infrastructure, including trimming trees near power lines. Review scenic road designation to allow for more flexibility in tree trimming.	Ongoing	STAPLEE Score = 2 Rank = 9 out of 13	STAPLEE Score = 9 Rank = 7 out of 10
Establish emergency lanes on Class VI roads for the purpose of fire protection.	Completed/Deleted	STAPLEE Score = 6 Rank = 6 out of 13	This action has been completed and is no longer considered a priority. A similar action was not identified in the 2021 Plan update.

CHAPTER 3. HAZARD IDENTIFICATION AND RISK ASSESSMENT

Section 3.1 ~ Description of Natural Hazards

The Town of Lyndeborough is susceptible to a variety of natural hazards, which are outlined in Table 3. For each hazard type, the hazard location within the Town, extent, and impact are also noted. Extent refers to how bad the hazard can be; it is not the same as location. Examples of extent include potential wind speed, depth of flooding, and existing scientific scales (ex. Enhanced Fujita Tornado Damage Scale). Impact refers to damages or consequences resulting from the hazard.

Landslides and snow avalanches have not been included in the Lyndeborough Hazard Mitigation Plan Update 2021. “A landslide is the downward or outward movement of slope forming materials reacting under the force of debris slides and earth flows” (State of NH Multi-Hazard Mitigation Plan Update 2013, pg 56). “A snow avalanche is a slope failure consisting of a mass of rapidly moving, fluidized snow that slides down a mountainside” (State of NH Multi-Hazard Mitigation Plan Update 2013, pg 77). Lyndeborough has relatively stable terrain and there have been no historic landslide or snow avalanche events in town. As such, the Hazard Mitigation Team did not feel it was necessary to include these hazards in this Plan.

The State of New Hampshire also identifies Solar Storms & Space Weather and Infectious Disease as hazards. Solar Storms & Space Weather and Infectious Disease were not included in this plan, as the Hazard Mitigation Team did not have enough knowledge to determine if these hazards deserved to be recognized in this plan update. The Town will re-evaluate the need to include additional hazards to this Plan during subsequent updates.

Table 3—Natural Hazards in Jurisdiction

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
Climate Change	Entire jurisdiction.	See Hazard Extent descriptions for Drought, Extreme Temperatures, Flooding	See Impact descriptions for Drought, Extreme Temperatures, Flooding
Drought	Entire jurisdiction.	<u>NH DES Drought Management Plan</u> <ul style="list-style-type: none">• Level 1—Alert• Level 2—Warning• Level 3—Emergency• Level 4—Disaster <u>US Drought Monitor</u> <ul style="list-style-type: none">• D0—Abnormally Dry• D1—Moderate Drought• D2—Severe Drought	<u>D0</u> <ul style="list-style-type: none">• short term dryness slowing planting, growth of crops• some lingering water deficits• crops not fully recovered <u>D1</u> <ul style="list-style-type: none">• some damage to crops• streams, reservoirs, or wells low, some water shortages developing or

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		<ul style="list-style-type: none"> D3-Extreme Drought D4—Exceptional Drought S—Short term, typically less than 6 months L—Long term, typically more than 6 months 	<p>imminent</p> <ul style="list-style-type: none"> voluntary water-use restrictions requested <p><u>D2</u></p> <ul style="list-style-type: none"> crop losses likely water shortages common water restrictions imposed <p><u>D3</u></p> <ul style="list-style-type: none"> major crop losses widespread water shortages or restrictions <p><u>D4</u></p> <ul style="list-style-type: none"> Exceptional & widespread crop loss Shortages of water in reservoirs, streams, & wells creating water emergencies <p><u>S</u></p> <ul style="list-style-type: none"> impacts on agriculture <p><u>L</u></p> <ul style="list-style-type: none"> impacts on hydrology & ecology
Earthquake	Entire jurisdiction.	<p><u>Richter Scale</u></p> <ul style="list-style-type: none"> <3.4—detected only by seismometers >8—total damage, surface waves seen, objects thrown in air <p>For full definitions of Richter Scale, see Section 3.5 Vulnerability by Hazard</p>	<p>Structural damage or collapse of buildings.</p> <p>Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system.</p> <p>Loss of water for fire protection.</p> <p>Increased risk of fire (gas break).</p> <p>Risk to life, medical surge.</p>
Extreme Temperatures	Entire jurisdiction.	<p>Extreme heat—period of 3 consecutive days when air temperature reaches 90°F or higher on each day.</p> <p>Extreme cold— period of 3 consecutive days of minimum temperatures at or below 0°F.</p>	<p>Overburdened power systems may experience failures due to extreme heat.</p> <p>Shortages of heating fuel in extreme cold due to high demand.</p> <p>Medical surge.</p>

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
			Loss of water sources for drinking water and fire protection due to freezing temperatures.
Flooding	<p>Floodplains cover approximately 1.77% of Lyndeborough—1.76% of Lyndeborough is located in 1% annual floodplain and 0.01% of Lyndeborough is located in the 0.2% annual floodplain.</p> <p>See Section 3.5 for additional information on flood-prone areas.</p>	<p>FEMA flood probabilities:</p> <ul style="list-style-type: none"> • 1% possibility per year • 0.2% possibility per year <p>State of NH Dam Hazard Potential Classification system (for flooding resulting from dam/levee failure):</p> <ul style="list-style-type: none"> • Class S—significant hazard • Class H—high hazard • Class L—low hazard • Class NM—non-menace <p>For full definitions of Dam Hazard Classes, see Section 3.5 Vulnerability by Hazard</p>	<p>Water damage to structures and their contents.</p> <p>Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system.</p> <p>Environmental hazards resulting from damage.</p> <p>Isolation of neighborhoods resulting from flooding.</p>
Lightning	<p>Entire jurisdiction.</p> <p>Recurring lighting strikes near Waterview Circle and Highlander Court</p> <p>Areas with large populations present outdoors and large open spaces are particularly vulnerable.</p>	<p>Lightning Activity Level:</p> <ul style="list-style-type: none"> • Level 1 • Level 2 • Level 3 • Level 4 • Level 5 • Level 6 <p>For full definitions of Lightning Activity Level, see Section 3.5 Vulnerability by Hazard</p>	<p>Smoke and fire damage to structures and property.</p> <p>Disruption to power lines, municipal communications, and 911 communications.</p> <p>Damage to critical electronic equipment.</p> <p>Injury or death to people involved in outdoor activity.</p>
Severe Wind	Entire jurisdiction.	<p>Saffir-Simpson Hurricane Wind Scale:</p> <ul style="list-style-type: none"> • Category 1—sustained winds 74-95 mph • Category 2—sustained winds 96-110 mph • Category 3—sustained winds 111-129 mph • Category 4—sustained winds 130-156 mph • Category 5—sustained winds 157 mph or higher 	<p>Wind damage to structures and trees.</p> <p>Water damage to structures and their contents.</p> <p>Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system.</p>

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
			<p>Environmental hazards resulting from damage.</p> <p>Isolation of neighborhoods resulting from flooding.</p> <p>Water pressure, quality, and capacity issues impacting fire protection.</p> <p>Loss of natural resources.</p>
Severe Winter Weather	Entire jurisdiction.	<p>Depth of snow in a given time frame (ex. 2 or more inches per hour over a 12-hour period).</p> <p>Blizzard—violent snowstorm with minimum winds of 35 mph and visibility less than ¼ mile for 3 hours.</p> <p>Ground snow load factor.</p> <p>Ice Storm—Sperry-Piltz Ice Accumulation Index:</p> <ul style="list-style-type: none"> • 0—little impact • 5—catastrophic damage to exposed utility systems <p>For full definitions of Sperry-Plitz Ice Accumulation Index, see Section 3.5 Vulnerability by Hazard</p>	<p>Disruption to road network.</p> <p>Damage to trees municipal communications, and 911 communications.</p> <p>Structural damage to roofs/collapse.</p> <p>Increase in CO, other hazards.</p>
Tornado/Downburst	Entire jurisdiction.	<p>Enhanced Fujita Tornado Damage Scale:</p> <ul style="list-style-type: none"> • EF0—winds 65-85 mph • EF1—winds 86-110 mph • EF2—winds 111-135 mph • EF3—winds 136-165 mph • EF4—winds 166-200 mph • EF5—winds >200 mph 	<p>Wind damage to structures and trees.</p> <p>Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system.</p> <p>Environmental hazards resulting from damage.</p> <p>Medical surge.</p> <p>Loss of natural resources.</p>
Wildfire	Areas particularly prone to wildfire include forested areas near	<p>NWCG Fire Size Classification:</p> <ul style="list-style-type: none"> • A—greater than 0 but less than or equal to 0.25 acres • B—0.26 to 9.9 acres 	Smoke and fire damage to structures in wild land/urban interface.

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
	residential development.	<ul style="list-style-type: none"> • C—10.0 to 99.9 acres • D—100-299 acres • E—300 to 999 acres • F—1,000 to 4,999 acres • G—5,000 to 9,999 acres • H—10,000 to 49,999 acres • I—50,000 to 99,999 acres • J—100,000 to 499,999 acres • K—500,000 to 999,999 acres • L—1,000,000+ acres 	Damage to habitat. Impacts to air quality. Impact to roadways. Loss of natural resources.

Section 3.2 ~ Description of Previous Hazards

The first step in determining the probability of future hazard events in the Town of Lyndeborough is to examine the location, extent, and impact of previous hazards. If a hazard event has not occurred within Lyndeborough but has occurred in the region it is also noted.

Table 4—Previous Occurrences of Hazards in Jurisdiction

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Climate Change	It is beyond the scope of this Plan to determine if a specific hazard event was the result of Climate Change.			
Drought	1960-1969	Entire jurisdiction	Long term drought—9 years of less than normal precipitation	Farms had minimal grass for grazing animals and poor crops. Wells went dry for 2 consecutive years in mid-1960s.
Drought	1999	Entire jurisdiction	Level 2—Warning. Drought warning issued on June 29, 1999.	Damage to crops. Low water levels in dug wells.
Drought	March 2002	Entire jurisdiction	Level 3—Emergency. First time Level 3 Drought Impact Level had been declared.	Damage to crops. Low water levels in dug wells.
Drought	May 2015	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Drought	June 2015	Entire jurisdiction	USDA D1 (Moderate Drought)	Damage to crops.
Drought	August-September 2015	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	October 2015-February 2016	Entire jurisdiction	USDA D1 (Moderate Drought)	Damage to crops.
Drought	March 2016-June 2016	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops. Low water levels in wells.
Drought	July 2016-September 2016	Entire jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells.
Drought	October 2016-December 2016	Entire jurisdiction	USDA D3 (Extreme Drought)	Low water levels in wells.
Drought	January 2017-March 2017	Entire jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells.
Drought	April 2017	Entire jurisdiction	USDA D1 (Moderate Drought)	Low water levels in wells.
Drought	June-July 2018	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	September-October 2019	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	May 26-June 22 2020	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	June 23 - August, 2020	Entire Jurisdiction	USDA D1 (Moderate Drought)	Low water levels in wells.
Drought	September 2020	Entire Jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells, wells went dry.
Earthquake		There have been no earthquakes centered in Lyndeborough to date. Earthquakes noted below were centered in NH.	Earthquakes noted below had a magnitude of 2.5 or greater.	
Earthquake	March 18, 1926	Manchester, NH	No historic data on extent	Intensity V effects observed in Amherst, Lyndeborough, Manchester, Mason, and Wilton.
Earthquake	December 20, 1940	Lake Ossipee, NH	Magnitude 5.5 on Richter Scale	No damage in Lyndeborough
Earthquake	December 24, 1940	Lake Ossipee, NH	Magnitude 5.5 on Richter Scale	No damage in Lyndeborough
Earthquake	December 4, 1963	Laconia, NH (43.6 latitude, -71.5 longitude)	Magnitude 3.7 on Richter Scale	No damage in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Earthquake	June 28, 1981	Sanbornton, NH (43.56 latitude, - 71.56 longitude)	Magnitude 3.0 on Richter Scale	No damage in Lyndeborough
Earthquake	January 19, 1982	Sanbornton, NH (43.5 latitude, -71.6 longitude)	Magnitude 4.7 on Richter Scale	No damage in Lyndeborough
Earthquake	October 25, 1986	Northfield, NH (43.399 latitude, - 71.59 longitude)	Magnitude 3.9 on Richter Scale	No damage in Lyndeborough
Earthquake	October 20, 1988	Milan, NH (44.539 latitude, - 71.158 longitude)	Magnitude 3.9 on Richter Scale	No damage in Lyndeborough
Earthquake	November 22, 1988	Milan, NH (44.557 latitude, - 71.183 longitude)	Magnitude 3.2 on Richter Scale	No damage in Lyndeborough
Earthquake	April 6, 1989	Berlin, NH (44.511 latitude, - 71.144 longitude)	Magnitude 3.5 on Richter Scale	No damage in Lyndeborough
Earthquake	October 6, 1992	Canterbury, NH (43.324 latitude, - 71.578 longitude)	Magnitude 3.4 on Richter Scale	No damage in Lyndeborough
Earthquake	June 16, 1995	Lyman, NH (44.286 latitude, - 71.915 longitude)	Magnitude 3.8 on Richter Scale	No damage in Lyndeborough
Earthquake	August 21, 1996	Bartlett, NH (44.184 latitude, - 71.352 longitude)	Magnitude 3.8 on Richter Scale	No damage in Lyndeborough
Earthquake	January 27, 2000	Raymond, NH (43.00 latitude, - 71.18 longitude)	Magnitude 3.0 on Richter Scale	No damage in Lyndeborough
Earthquake	September 26, 2010	Boscawen, NH (43.2915 latitude, - 71.6568 longitude)	Magnitude 3.4 on Richter Scale	No damage in Lyndeborough
Earthquake	October 11, 2013	Contoocook, NH (43.255 latitude, - 71.747 longitude)	Magnitude 2.6 on Richter Scale	No damage in Lyndeborough
Earthquake	March 21, 2016	Contoocook, NH (43.264 latitude, - 71.767 longitude)	Magnitude 2.8 on Richter Scale	No damage in Lyndeborough
Earthquake	February 15, 2018	East Kingston, NH (42.921° latitude - 71.011° longitude)	Magnitude 2.7 on Richter Scale	No damage in Lyndeborough
Earthquake		Earthquakes noted below were centered outside of NH but were felt by NH municipalities.		No damage in Lyndeborough
Earthquake	November 18, 1929	Grand Banks, Newfoundland	Magnitude 7.2 on Richter Scale	No damage in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Earthquake	November 1, 1935	Timiskaming, Canada	Magnitude 6.25 on Richter Scale	No damage in Lyndeborough
Earthquake	June 15, 1973	Near Canadian/NH border	Magnitude 4.8 on Richter Scale	No damage in Lyndeborough
Earthquake	June 23, 2010	Buckingham, Quebec, Canada	Magnitude 5.0 on Richter Scale	No damage in Lyndeborough
Earthquake	August 23, 2011	Washington, DC	Magnitude 5.8 on Richter Scale	No damage in Lyndeborough
Earthquake	October 16, 2012	Hollis Center, ME	Magnitude 4.0 on Richter Scale	No damage in Lyndeborough
Extreme Temperature (Cold)	January 16-20, 2000	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/16/00: -3°F • 1/17/00: -2°F • 1/18/00: -5°F • 1/19/00: -6°F • 1/20/00: -4°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 28-30, 2000	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/28/00: -6°F • 1/29/00: -2°F • 1/30/00: -4°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 18-20, 2003	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/18/00: -9°F • 1/19/00: -11°F • 1/20/00: -11°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 28-31, 2003	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/28/03: -9°F • 1/29/03: -5°F • 1/30/03: -0°F • 1/31/03: -0°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	February 13-17, 2003	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 2/13/03: -3°F • 2/14/03: -11°F • 2/15/03: -10°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			<ul style="list-style-type: none"> 2/16/03: -7°F 2/17/03: -2°F 	
Extreme Temperature (Cold)	February 26-28, 2003	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 2/26/03: -4°F 2/27/03: -6°F 2/28/03: -1°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 9-12, 2004	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 1/9/04: -7°F 1/10/04: -8°F 1/11/04: -8°F 1/12/04: -7°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 14-17, 2004	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 1/14/04: -10°F 1/15/04: -10°F 1/16/04: -12°F 1/17/04: -9°F 	Wind chills of -30°F, 6 fatalities in NH
Extreme Temperature (Cold)	January 24-27, 2004	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 1/24/04: -4°F 1/25/04: -6°F 1/26/04: -6°F 1/27/04: -0°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 18-25, 2005	Entire jurisdiction	8 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 1/18/05: 0°F 1/19/05: -8°F 1/20/05: -3°F 1/21/05: -5°F 1/22/05: -12°F 1/23/05: -9°F 1/24/05: 0°F 1/25/05: -1°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 28-30, 2005	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F:	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			<ul style="list-style-type: none"> • 2/28/05: -1°F • 2/29/05: -7°F • 2/30/05: -5°F 	
Extreme Temperature (Cold)	January 16-18, 2009	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/16/09: -16°F • 1/17/09: -16°F • 1/18/09: -9°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 25-27, 2009	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/25/09: -7°F • 1/26/09: -7°F • 1/27/09: -5°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 15-18, 2011	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/15/11: -6°F • 1/16/11: -5°F • 1/17/11: 0°F • 1/18/11: -2°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 23-27, 2011	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/23/05: -5°F • 1/24/05: -10°F • 1/25/05: -9°F • 1/26/05: -3°F • 1/27/05: -2°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 15-17, 2012	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 1/15/12: -2°F • 1/16/12: -2°F • 1/17/12: 0°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	February 11-13, 2014	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> • 2/11/14: -7°F • 2/12/14: -7°F • 2/13/14: -7°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Cold)	February 1-4, 2015	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 2/1/15: 0°F 2/2/15: 0°F 2/3/15: -3°F 2/4/15: -2 	No known impact in Lyndeborough
Extreme Temperature (Cold)	February 14-19, 2015	Entire Jurisdiction	6 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 2/14/15: -7°F 2/15/15: -4°F 2/16/15: -5°F 2/17/15: -2°F 2/18/15: -3°F 2/19/15: -4°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	February 14-16, 2016	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 2/14/16: -11°F 2/15/16: -9°F 2/16/16: -9°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	December 28-31, 2017	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 12/28/17: -7°F 12/29/17: -9°F 12/30/17: -6°F 12/31/17: -11°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 1-3, 2018	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 1/1/18: -5°F 1/2/18: -14°F 1/3/18: -13°F 	No known impact in Lyndeborough
Extreme Temperature (Cold)	January 31-February 3, 2019	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: <ul style="list-style-type: none"> 1/31/19: -3°F 2/1/19: -3°F 2/2/19: -5°F 2/3/19: -4°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Heat)	May 3-5, 2001	Entire jurisdiction*	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 5/3/01—93°F • 5/4/01—92°F • 5/5/01—92°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	June 15-17, 2001	Entire jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 6/15/01—92°F • 6/16/01—95°F • 6/17/01—91°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 22-26, 2001	Entire jurisdiction	5 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/22/01—90°F • 7/23/01—90°F • 7/24/01—92°F • 7/25/01—95°F • 7/26/01—93°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 7-10, 2001	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/7/01—94°F • 8/8/01—97°F • 8/9/01—96°F • 8/10/01—100°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 2-5, 2002	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/2/02—90°F • 7/3/02—95°F • 7/4/02—98°F • 7/5/02—97°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 30-August 2, 2002	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/30/02—90°F • 7/31/02—91°F • 8/1/02—91°F • 8/2/02—93°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 13-20, 2002	Entire jurisdiction	8 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/13/02—94°F • 8/14/02—96°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			<ul style="list-style-type: none"> • 8/15/02—98°F • 8/16/02—95°F • 8/17/02—94°F • 8/18/02—92°F • 8/19/02—94°F • 8/20/02—92°F 	
Extreme Temperature (Heat)	June 25-28, 2003	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 6/25/03—90°F • 6/26/03—93°F • 6/27/03—92°F • 6/28/03—92°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 5-7, 2003	Entire jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/5/03—91°F • 7/6/03—90°F • 7/7/03—91°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 17-19, 2006	Entire jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/17/06—90°F • 7/18/06—93°F • 7/19/06—94°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 2-4, 2006	Entire jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/2/06—96°F • 8/3/06—97°F • 8/4/06—92°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 16-20, 2006	Entire jurisdiction	5 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/16/09—90°F • 8/17/09—90°F • 8/19/09—91°F • 8/19/09—93°F • 8/20/09—90°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 4-10, 2010	Entire jurisdiction	7 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/4/10—90°F • 7/5/10—90°F • 7/6/10—97°F • 7/7/10—98°F • 7/8/10—97°F • 7/9/10—92°F • 7/10/10—92°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Heat)	July 17-20, 2010	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/17/10—93°F • 7/18/10—93°F • 7/19/10—93°F • 7/20/10—90°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 30-Sept. 3, 2010	Entire jurisdiction	5 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/30/10—92°F • 8/31/10—91°F • 9/1/10—94°F • 9/2/10—95°F • 9/3/10—96°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 21-24, 2011	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/21/11—92°F • 7/22/11—96°F • 7/23/11—101°F • 7/24/11—96°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	June 21-23, 2012	Entire jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 6/21/12—96°F • 6/22/12—94°F • 6/23/12—93°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 13-16, 2012	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/13/12—92°F • 7/14/12—92°F • 7/15/12—93°F • 7/16/12—91°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 3-6, 2012	Entire jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/3/12—91°F • 8/4/12—94°F • 8/5/12—95°F • 8/6/12—93°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	June 1-3, 2013	Entire jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 6/1/13—93°F • 6/2/13—92°F • 6/3/13—91°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Heat)	July 16-21, 2013	Entire jurisdiction	6 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/16/13—90°F • 7/17/13—91°F • 7/18/13—93°F • 7/19/13—93°F • 7/20/13—96°F • 7/21/13—91°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 29-31, 2015	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/29/15—93°F • 7/30/15—94°F • 7/31/15—90°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 16-20, 2015	Entire Jurisdiction	5 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 8/16/15—90°F • 8/17/15—90°F • 8/18/15—91°F • 8/19/15—93°F • 8/20/15—90°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	September 2-4, 2015	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 9/2/15—91°F • 9/3/15—92°F • 9/4/15—92°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	September 7-11, 2015	Entire Jurisdiction	5 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 9/7/15—90°F • 9/8/15—94°F • 9/9/15—94°F • 9/10/15—94°F • 9/11/15—93°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 22-29, 2016	Entire Jurisdiction	8 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> • 7/22/16—95°F • 7/23/16—93°F • 7/24/16—93°F • 7/25/16—92°F • 7/26/16—96°F • 7/27/16—96°F • 7/28/16—93°F • 7/29/16—93°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Heat)	June 12-14, 2017	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 6/12/17—94°F 6/13/17—98°F 6/14/17—96°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 20-22, 2017	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 7/20/17—93°F 7/21/17—94°F 7/22/17—92°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 1-4, 2017	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 8/1/17—90°F 8/2/17—92°F 8/3/17—91°F 8/4/17—90°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	September 25-28, 2017	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 9/25/17—93°F 9/26/17—91°F 9/27/17—90°F 9/28/17—91°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 1-7, 2018	Entire Jurisdiction	7 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 7/1/18—91°F 7/2/18—95°F 7/3/18—92°F 7/4/18—95°F 7/5/18—92°F 7/6/18—92°F 7/7/18—92°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	August 29-31, 2018	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 8/29/18—92°F 8/30/18—93°F 8/31/18—93°F 	No known impact in Lyndeborough
Extreme Temperature (Heat)	July 20-22, 2019	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 7/20/19—91°F 7/21/19—95°F 7/22/19—93°F 	No known impact in Lyndeborough

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Heat)	August 10-13, 2020	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: <ul style="list-style-type: none"> 8/10/20—91°F 8/11/20—95°F 8/12/20—93°F 8/13/20—93°F 	No known impact in Lyndeborough
Flooding	1927	Hillsborough County	No data on extent available	Damage to road network.
Flooding	March 11-21, 1936	Hillsborough County	25-50 year recurrence interval	\$133,000,000 in property damage and 77,000 homeless throughout New England. Primary impact to structures, infrastructure, and road network. Flooding caused by heavy snowfall totals, heavy rains, and warm weather. Impact listed here are general to Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	July 11, 1973	Hillsborough County	No data on extent available	FEMA Disaster Declaration #399. Specific impacts to Lyndeborough are unknown.
Flooding	July 29-August 10, 1986	Hillsborough County	No data on extent available	FEMA Disaster Declaration #771. Many roads impassable in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	March 30-April 11, 1987	Hillsborough County	25-50+ year recurrence interval	\$4,888,889 in damage in NH. FEMA Disaster Declaration #789. Primary impact to agricultural fields in

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	August 7-11, 1990	Hillsborough County	No data on extent available	\$2,297,777 in damage in NH. FEMA Disaster Declaration #876. Primary impact to infrastructure in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	October 20-23, 1996	Hillsborough County	No data on extent available	\$2,341,273 in damage in NH. FEMA Disaster Declaration #1144. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	July 2, 1998	Hillsborough County	No data on extent available	\$3,400,000 in damage in NH, 6 counties impacted including Hillsborough. FEMA Disaster Declaration #1231. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	October 26, 2005	Hillsborough County	50-100-year recurrence interval	5 counties impacted in NH, including Hillsborough. FEMA Disaster Declaration #1610. Primary impact to structures and

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				infrastructure in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	May 12-23, 2006	Hillsborough County	As much as 14 inches of rainfall in region. 100-500-year recurrence interval.	7 counties impacted in NH, including Hillsborough. FEMA Disaster Declaration #1643. Numerous roads and bridges were washed out in Lyndeborough.
Flooding	April 15, 2007	Hillsborough County	100-500-year recurrence interval	\$27,000,000 in damages in NH; 2,005 homeowners and renters applied for assistance in NH. FEMA Disaster Declaration #1695. Primary impact to structures and infrastructure in Hillsborough County.
Flooding	September 6-7, 2008	Hillsborough County	50-100-year recurrence interval	\$6.90 per capita in damages in Hillsborough County. FEMA Disaster Declaration #1799. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	March 14, 2010	Hillsborough County	50-100-year recurrence interval	\$1,880,685 in FEMA public assistance in NH; \$1.80 per capita in Hillsborough County. Flooding near Johnson Corner due to undersized culvert. FEMA Disaster Declaration #1913

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				Primary impact to roads and bridges in Hillsborough County. Specific impacts to Lyndeborough are unknown.
Flooding	May 26, 2011	Hazard was not experienced in jurisdiction.	N/A	Disaster Declaration #4006. No impact to Lyndeborough.
Flooding	May 29, 2012	Hazard was not experienced in jurisdiction.	N/A	Disaster Declaration #4065. No impact to Lyndeborough.
Flooding	June 26, 2013	Hazard was not experienced in jurisdiction.	N/A	Disaster Declaration #4139. No impact to Lyndeborough.
Flooding	July 1, 2017	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4329. No impacts to Lyndeborough.
Flooding	October 29 – November 1, 2017	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4355. No impacts to Lyndeborough.
Flooding	March 2-8, 2018	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4370. No impacts to Lyndeborough.
Flooding	July 11-12, 2019	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4357. No impacts to Lyndeborough.
Flooding	July 2009	Route 31 near Buck Road in Lyndeborough	No data on extent available	Beaver dam near Buck Road breached, flooded Rt. 31. Road repairs required to Rt. 31, culvert replaced.
Flooding – Dam Failure	There have been no dam failures to date in Lyndeborough			
Severe Wind	Great Hurricane of 1938	Hillsborough County	No data on extent available	\$12,337,643 total damages (not adjusted for inflation), 13 deaths and 494 injuries in NH. Damage to road network and structures caused by flooding.
Severe Wind	August 31, 1954 (Carol)	Hillsborough County	Saffir-Simpson Scale Category 3.	Extensive tree and crop damage.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Severe Wind	September 12, 1960 (Donna)	Hillsborough County	Saffir-Simpson Scale Category 3	Water damage to structures due to flooding.
Severe Wind	September 27, 1985 (Gloria)	Hillsborough County	Saffir-Simpson Scale Category 2	Damage to trees and power lines from high winds.
Severe Wind	August 19, 1991 (Bob)	Hillsborough County	Saffir-Simpson Scale Category 1	FEMA Disaster Declaration #917. Damage to structures, trees, and power lines from high winds.
Severe Wind	September 16-18, 1999 (Floyd)	Hillsborough County	Tropical Storm (winds 39-73 mph)	FEMA Disaster Declaration #1305. Primary impact to trees, infrastructure, and road network.
Severe Wind	August 28, 2011 (Irene)	Hillsborough County	Tropical Storm (winds 39-73 mph).	FEMA Disaster Declaration #4026. Damage to trees and power lines from high winds. Flash floods.
Severe Wind	October 26, 2012 (Sandy)	Hillsborough County	Tropical Storm (winds 39-73 mph).	FEMA Disaster Declaration #4095. Minimal damage.
Severe Wind	October 29-30, 2017	Hillsborough County	Tropical Storm (winds 39-73 mph).	A powerful storm fed by tropical moisture knocked out power to more than 270,000 homes and business across the state. Lyndeborough experienced 2.8 inches of rainfall and widespread power outages. Falling trees severely damaged many homes and electrical infrastructure. Local roads were closed due to downed trees and flash flooding.
Severe Wind	There has been no significant damage from tropical-post tropical cyclones (severe wind) in			

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
	Lyndeborough since 2018.			
Lightning	2005	Entire jurisdiction, lightning strike occurred in Holt Brothers Industrial Complex	Severe thunderstorm with heavy rainfall, high winds, and lightning	Lightning strike destroyed five businesses in the Holt Brothers Industrial Complex. Took 20 hours to put out fires from oil and petroleum-based chemicals.
Lightning	There has been no significant damage from lightning in Lyndeborough since 2005.			
Severe Winter Weather	March 11-14, 1888	Entire jurisdiction	30-50 inches of snow	No historic data on impact
Severe Winter Weather	1922	Entire jurisdiction	No historic data on extent	Extreme snow drifts paralyzed road network.
Severe Winter Weather	February 14-15, 1940	Entire jurisdiction	Over 30 inches of snow	Snow and high winds paralyzed road network.
Severe Winter Weather	February 14-17, 1958	Entire jurisdiction	20-33 inches of snow	Primary impact to road network.
Severe Winter Weather	March 18-21, 1958	Entire jurisdiction	22-24 inches of snow	Primary impact to road network.
Severe Winter Weather	March 2-5, 1960	Entire jurisdiction	Up to 25 inches of snow	Primary impact to road network.
Severe Winter Weather	January 18-20, 1961	Entire jurisdiction	Up to 25 inches of snow	Blizzard conditions paralyze road network.
Severe Winter Weather	February 22-28, 1969	Entire jurisdiction	24-98 inches of snow in Central NH	Primary impact to road network. Slow moving storm.
Severe Winter Weather	December 25-28, 1969	Entire jurisdiction	12-18 inches of snow	Primary impact to road network.
Severe Winter Weather	January 19-21, 1978	Entire jurisdiction	Up to 16 inches of snow	Primary impact to road network.
Severe Winter Weather	February 5-7, 1978 (Blizzard of '78)	Entire jurisdiction	25-33 inches of snow	Snow paralyzed road network, trapped commuters in cars, and forced closure of businesses.
Severe Winter Weather	April 5-7, 1982	Entire jurisdiction	18-22 inches of snow	Primary impact to road network.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Severe Winter Weather	March, 1983	Entire jurisdiction	Over 18 inches of snow, 30-40 mph winds	Snow paralyzed road network and forced closure of businesses.
Severe Winter Weather	December 1996	Entire jurisdiction	14 inches of snow	Damage to power lines forces closure of businesses. Heavy wet snow caused many trees to come down.
Severe Winter Weather	January 7, 1998	Entire jurisdiction	Ice storm, no data on extent available	\$12,446,202 in total damages, 1 death and 6 injuries in NH. \$17,000,000 in damages to PSNH equipment. FEMA Disaster Declaration #1199. 20 major road closures; 67,586 without power; 2,310 without phone service; 1 communication tower failure.
Severe Winter Weather	December 11, 2008	Entire jurisdiction	Ice storm, no data on extent available	\$10,383,602 in FEMA public assistance in NH; \$6.35 per capita in Hillsborough County. FEMA Disaster Declaration #1812. Damage to power and phone lines, and trees. Damage to power and phone lines and trees.
Severe Winter Weather	February 23, 2010	Entire jurisdiction	Snow followed by rainfall between 2-6 inches. Winds over 70 mph.	\$6,268,179 in FEMA public assistance in NH; \$3.68 per capita in Hillsborough County. FEMA Disaster Declaration #1892 Damage to power and phone lines, trees, and road network. Over 330,000 customers

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				without power state-wide.
Severe Winter Weather	October 29-30, 2011	Entire jurisdiction	15-20 inches of snow.	\$3,052,769 in FEMA public assistance in NH; \$5.11 per capita in Hillsborough County. FEMA Disaster Declaration #4049 Damage to power and phone lines, trees, and road network.
Severe Winter Weather	February 8-10, 2013	Entire jurisdiction	Snowfall totals of 12-18 inches across region, up to 30 inches in parts of NH. Winds 10-20 mph with gusts up to 40 mph. Visibility less than ¼ mile.	FEMA Disaster Declaration #4105
Severe Winter Weather	January 26-28, 2015	Entire jurisdiction.	Snowfall totals of 18-24 inches across region. Winds 35 mph. Visibility 0.	\$3,293,059 in FEMA public assistance in NH; \$3.88 per capita in Hillsborough County. FEMA Disaster Declaration DR-4209.
Severe Winter Weather	March 14-15, 2017	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4316. No impacts to Lyndeborough.
Severe Winter Weather	March 13-14, 2018	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4371. No impacts to Lyndeborough.
Tornado		No Tornadoes have originated in Lyndeborough to-date. Tornadoes noted below originated in Hillsborough Co, NH.		http://www.tornadohistoryproject.com/tornado/New_Hampshire
Tornado	July 2, 1961	Northern Hillsborough Co, originated near Weare, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	July 21, 1961	Central Hillsborough Co, originated near New Boston, NH	Fujita Scale F1	0 fatalities, 0 injuries

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Tornado	May 9, 1963	Northeastern, Hillsborough Co, originated near Goffstown, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	May 20, 1963	Western Hillsborough Co, originated near Peterborough, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	June 9, 1963	Northeastern Hillsborough Co, originated near Manchester, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	August 28, 1965	Eastern Hillsborough Co, originated near Litchfield, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 19, 1966	Southern Hillsborough Co, originated near Amherst, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 17, 1968	Central Hillsborough Co, originated near Wilton, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	August 20, 1968	Northeastern Hillsborough Co, originated near Manchester, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 19, 1972	Southeastern Hillsborough Co, originated near Hudson, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 5, 1984	Western Hillsborough Co, originated near Harrisville, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 5, 1984	Southeastern Hillsborough Co, originated near Pelham, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	June 16, 1986	Western Hillsborough Co, originated near Swanzey, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 3, 1997	Central Hillsborough Co, originated near Greenfield, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	May 31, 1998	Western Hillsborough Co, originated near Antrim, NH	Fujita Scale F2	0 fatalities, 0 injuries

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Downburst	July 6, 1999	Merrimack, Grafton, and Hillsborough Co.	Macrobust	2 fatalities, 2 lost roofs, damage to trees and utility infrastructure
Tornado	July 24, 2008	Rockingham, Merrimack, Belknap, Strafford and Carrol Co.	Fujita Scale F2	1 fatality, 2 injuries, significant structural damage
Wildfire	June 2012	Cemetery Road	NWCG Fire Class A— ¼ acre of brush burned	No significant damage

**NOAA does not have a full history of temperature data for the Town of Lyndeborough, NH. Extreme Temperature data is based on readings from NOAA weather station in Milford, NH.*

Section 3.3 ~ Probability of Future Hazard Events

After documenting the occurrence of previous hazard events in the Town of Lyndeborough and the surrounding region, the Hazard Mitigation Team used this information to calculate the annual probability of these events occurring in the future. The first step was to determine how many times a particular hazard had occurred in a given number of years. The number of occurrences was then divided by the number of years to determine annual probability. For example, if history shows that a particular hazard typically occurs 1 time every 4 years, the annual probability is 25%. Annual probability was calculated twice for each hazard. First, annual probability was calculated since the first recorded historic occurrence of the event. Second, annual probability was calculated based on occurrences since 2000 to reflect potential recent changes in hazard event occurrence rates. The probability of future hazard events for each hazard type in the Town of Lyndeborough is outlined in Table 5.

Table 5—Probability of Future Hazard Events

Hazard Type	Probability of Future Event	Source
Climate Change— Drought	The frequency of short-term drought (1-3 months) in New Hampshire is predicted to increase 2-3 times in the long term (2070-2099) under the higher emissions scenario. The state will experience a more significant increase in medium-term drought (3-6 months) during this period. Short and medium-term droughts are primarily caused by evapotranspiration as a result of hotter summers. The frequency of	“Climate Change in Southern New Hampshire,” Sustainability Institute, University of New Hampshire, 2014

Hazard Type	Probability of Future Event	Source
	long-term drought (6 plus months) does not change significantly in the future under the low or high emissions scenario compared to past long-term drought events in New Hampshire (Wake et al., "Climate Change in Southern New Hampshire," pg. 30-31).	
Climate Change— Increased Precipitation	Annual average precipitation is predicted to increase 17-20% in southern New Hampshire by the end of the century under both the low and high emissions scenarios. Larger increases in precipitation are expected in the winter and spring, while summer and fall will only experience slight increases (Wake et al., "Climate Change in Southern New Hampshire," pg. 29). Southern New Hampshire can also expect more extreme precipitation events, defined as those where more than 1 inch of rain falls within 24 hours or more than 2-4 inches falls in 48 hours. Under both low and high emissions scenarios, the frequency of extreme precipitation events is predicted to more than double by the end of the century (Wake et al., "Climate Change in Southern New Hampshire," pg. 29).	"Climate Change in Southern New Hampshire," Sustainability Institute, University of New Hampshire, 2014
Climate Change— Warmer Temperatures	Temperatures in southern New Hampshire will continue to rise under a lower or higher future emissions scenario. In the short-term (2010-2039), average annual temperatures are predicted to increase by approximately 2°F. Under a higher emissions scenario, long-term (2070-2099) average annual temperatures are predicted to increase by 8 to 9°F. If a lower emissions scenario is achieved, long-term average annual temperatures are predicted to increase by 4°F (Wake et al., "Climate Change in Southern New Hampshire," pg. 23). The region is also predicted to experience more extreme heat	"Climate Change in Southern New Hampshire," Sustainability Institute, University of New Hampshire, 2014

Hazard Type	Probability of Future Event	Source
	<p>events. From 1970-1999, southern New Hampshire had an average of seven days above 90°F each year. In the long-term under a higher emissions scenario, southern New Hampshire is predicted to have over 54 days per year above 90°F. Under a lower emissions scenario, the region is predicted to have 23 days per year above 90°F in the long-term (Wake et al., "Climate Change in Southern New Hampshire," pg. 25).</p>	
Drought	<p>17 years of drought from 1960 through 2020.</p> <p>17 events in 60 years = 0.28 events per year</p> <p>Annual Probability = 28%</p> <p>7 years of drought from 2000 through 2020.</p> <p>4 events in 20 years = 0.35</p> <p>Annual Probability = 35%</p>	<p>NH DES Current Drought Conditions http://des.nh.gov/organization/divisions/water/dam/drought/drought-conditions.htm</p> <p>US Drought Monitor http://droughtmonitor.unl.edu/Home.aspx</p>
Earthquake	<p>History shows no known earthquakes centered in Lyndeborough. However, this hazard is still possible.</p> <p>2 magnitude 5.0 or greater earthquakes felt in NH from 1926 through 2020.</p> <p>2 events in 94 years = 0.02 events per year</p> <p>Annual Probability = 2%</p> <p>0 magnitude 5.0 or greater earthquakes felt in NH from 2000 through 2020.</p> <p>0 events in 20 years = 0 events per year</p>	<p>US Geological Survey http://earthquake.usgs.gov/earthquakes/search/</p>

Hazard Type	Probability of Future Event	Source
	Annual Probability = 0-25%	
Extreme Temperatures	<p>34 extreme heat events from 2000 through 2020.</p> <p>34 events in 20 years = 1.7 event per year</p> <p>Annual Probability = 100%</p> <p>23 extreme cold events from 2000 through 2020.</p> <p>23 events in 20 years = 1.2 event per year</p> <p>Annual Probability = 100%</p>	<p>NOAA National Climatic Data Center https://www.ncdc.noaa.gov/cdo-web/search</p>
Flooding/Dam Failure	<p>21 flooding events in Hillsborough County from 1927 through 2020.</p> <p>21 events in 93 years = 0.23 events per year</p> <p>Annual Probability = 23%</p> <p>5 flooding events in Hillsborough County from 2000 through 2020.</p> <p>5 events in 20 years = 0.25 events per year</p> <p>Annual Probability = 25%</p> <p><u>Dam Failure</u> Because of limited data on previous dam failure events, probability cannot be calculated statistically.</p> <p>History shows no occurrences of dam failure causing damage in Merrimack. However, this hazard is still possible and therefore the probability is low.</p> <p>Low probability is defined as a 0-25% chance of occurrence annually. Dam Failure</p> <p>Annual Probability – 0-25%</p>	<p>Local knowledge</p> <p>FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year</p>

Hazard Type	Probability of Future Event	Source
Severe Wind	<p>10 hurricanes/tropical storms from 1938 through 2020.</p> <p>9 events in 83 years = 0.11 events per year</p> <p>Annual Probability = 11%</p> <p>4 hurricanes/tropical storms from 2000 through 2020.</p> <p>4 events in 20 years = 0.20 events per year</p> <p>Annual Probability = 20%</p>	<p>Local knowledge</p> <p>FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year</p> <p>National Hurricane Center http://www.nhc.noaa.gov/data/tcr/index.php?season=2014&basin=atl</p>
Lightning	<p>Because of limited data on previous lightning events, probability cannot be calculated statistically.</p> <p>History shows no occurrences of lightning strikes causing damage in Lyndeborough. However, this hazard is still possible and therefore the probability is low.</p> <p>Low probability is defined as a 0-25% chance of occurrence annually.</p>	Local knowledge and public input
Severe Winter Weather	<p>22 severe winter weather events in Hillsborough County from 1888 through 2021.</p> <p>22 events in 133 years = 0.17 events per year</p> <p>Annual Probability = 17%</p> <p>7 severe winter weather events in Hillsborough County from 2001 through 2021.</p> <p>7 events in 20 years = 0.35 events per year</p> <p>Annual Probability = 35%</p>	<p>Local knowledge</p> <p>FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year</p>
Tornado/Downburst	<p>16 tornados and 1 downburst in Hillsborough Co. from 1961 through 2020.</p>	<p>Tornado History Project (Joshua Lietz, Storm Prediction Center, National Climatic Data Center) and public input</p> <p>http://www.tornadohistoryproject.com</p>

Hazard Type	Probability of Future Event	Source
	<p>17 events in 59 years = 0.29 events per year</p> <p>Annual Probability = 29%</p> <p>0 tornados and 0 downbursts in Hillsborough Co. from 2000 through 2020.</p> <p>0 events in 20 years = 0 events per year</p> <p>Annual Probability = 0-25%</p>	
Wildfire	<p>Because of limited data on previous wildfire events, probability cannot be calculated statistically.</p> <p>History shows no occurrences of wildfires causing damage in Lyndeborough. However, this hazard is still possible and therefore the probability is low.</p> <p>Low probability is defined as a 0-25% chance of occurrence annually.</p>	Local knowledge and public input

Section 3.4 ~ Critical Facilities and their Vulnerability

The next step in determining Lyndeborough's overall vulnerability was to inventory the Town's community assets and determine what assets would be affected by each type of hazard event. The Hazard Mitigation Team began by reviewing the Lyndeborough Zoning Ordinance and Master Plan to provide information on where and how the Town builds and to identify the corridors where critical facilities would likely be located. The Team then identified the broad categories of important assets within Lyndeborough, including critical facilities essential to health and welfare; vulnerable populations, such as children and the elderly; economic assets and major employers; areas of high-density residential and commercial development; and historic, cultural, and natural resources. The Team then further divided the Town's critical facilities into the following categories:

1. General Occupancy

- a. Residential
- b. Commercial
- c. Industrial
- d. Agriculture
- e. Religion
- f. Government
- g. Education

2. Essential Facilities

- a. Fire Station
- b. Police Station
- c. Department of Public Works
- d. Schools
- e. Emergency Operations Centers
- f. Medical Care Facilities

3. Transportation Systems

- a. Highway Systems—Roads
- b. Highway Systems—Bridges
- c. Railway Systems
- d. Bus Facilities
- e. Airport Systems

4. Utility Systems

- a. Potable Water
- b. Drinking Water
- c. Oil/Propane Facilities
- d. Natural Gas Facilities
- e. Electric Power
- f. Communications

5. High Potential Hazard Facilities

- a. Dams/Levees
- b. Nuclear Power Plants

6. Hazardous Materials Facilities

- a. EPA Toxics Release Inventory facilities (<http://www2.epa.gov/toxics-release-inventory-tri-program>)

The critical facilities within each category appear in the Tables 6.1-6.6 below. Each table includes the critical facility's name, content vulnerability, and locational vulnerability to hazards. Note that Climate Change is not included as a hazard in this analysis because its effects on critical facilities are included under the hazards of Drought, Extreme Temperatures, and Flooding.

Table 6.1—General Occupancy Critical Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Government—Citizens' Hall – 9 Citizen's Hall Road	Official records and documents, evacuation point, historic resource	✓	✓			✓	✓	✓	✓	✓
Government—Tarbell Public Library – 136 Forest Road	Official records and documents, large population present	✓	✓			✓	✓	✓	✓	✓
Government—Post Office – 36 Forest Road	Contents important to communication	✓	✓			✓	✓	✓	✓	✓
Government—Center Hall	Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Recreation – Pinnacle Mountain Fish and Game Club – 289 Cemetery Road	Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Commercial— RK Village Store (Lyndeborough Village Store) – 151 Forest Road	Retail, contents valuable to local economy	✓	✓			✓	✓	✓	✓	✓
Commercial—Ferra Enterprises – 311 Mountain Road	Retail, contents valuable to local economy	✓	✓			✓	✓	✓	✓	✓
Commercial—Auto and Truck Repair	Retail, contents valuable to local economy	✓	✓			✓	✓	✓	✓	✓
Commercial—Winn Mountain Restorations – 75 Holt Road	Retail, contents valuable to local economy	✓	✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Commercial – Rue’s Auto 954 Center Road	Retail, contents valuable to local economy	✓	✓			✓	✓	✓	✓	✓
Commercial – Daycare – 170 Pinnacle Road	Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Commercial – Daycare – Pettingill Road	Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Commercial – Steve’s School Bus Service Inc. – 352 Center Road	Retail, contents valuable to local economy; Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Commercial – Fitch’s Farm Stand – 189 Center Road	Retail, contents valuable to local economy; Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Religion – United Church of Lyndeborough – 1139 Center Road	Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Religion—United Church of Lyndeborough – 5 Putnam Hill Road	Potentially large population present, evacuation point	✓	✓			✓	✓	✓	✓	✓

Table 6.2—Essential Facilities

Facility Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Police Station – 9 Citizen’s Hall Road	Contents and staff valuable to emergency management	✓	✓			✓	✓	✓	✓	✓

Facility Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Fire Station – 129 Forest Road	Contents and staff valuable to emergency management, serves as emergency operations center	✓	✓			✓	✓	✓	✓	✓
Highway Department – 46 Locust Lane	Contents valuable to transportation network and public infrastructure	✓	✓			✓	✓	✓	✓	✓
Lyndeborough Central School & SAU 63 Office	Potentially large population present, shelter	✓	✓			✓	✓	✓	✓	✓
Emergency Management Garage – 1645 Center Road	Contents and staff valuable to emergency management	✓	✓			✓	✓	✓	✓	✓

Table 6.3—Transportation Critical Facilities

Transportation infrastructure is particularly vulnerable to flooding hazards. Flooding events frequently cause culvert failures and undermine bridges and roads. Lyndeborough has a total of 68.2 road miles, of which 0.35 miles or 0.35% are located in the floodplain. The following table lists all the roadways and transportation infrastructure in Lyndeborough that are located in the floodplain, and critical to the transportation network.

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Highway System—Old Temple Road Bridge	Structure valuable to motor vehicle travel and safety		✓		✓	✓		✓	✓	
Highway System—Pettingill Hill Road Culvert	Structure valuable to motor vehicle travel and safety; culvert received mostly incompatible rating		✓		✓	✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Highway System—Glass Factory Road Bridge	Railroad bridge, structure valuable to motor vehicle safety and rail travel		✓		✓	✓		✓	✓	
Highway System—Route 31 Bridge (located in Wilton)	Structure valuable to motor vehicle travel and safety		✓		✓	✓		✓	✓	
Airport System—LCS Helicopter Landing Area – Forest Road	Structure used for medical evacuation flights		✓		✓	✓	✓	✓	✓	
Airport System – Center Road Helicopter Landing Area (at United Church of Lyndeborough) – Center Road	Structure used for medical evacuation flights		✓		✓	✓	✓	✓	✓	
Airport System – Helicopter Landing Area (Field Behind Citizen’s Hall) – Citizen’s Hall Road	Structure used for medical evacuation flights		✓		✓	✓	✓	✓	✓	

Table 6.4—Utility Systems

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Electric (Eversource) — Distribution system (poles & wires), including transformers and other electrical equipment.	Structures valuable to utility network		✓			✓	✓	✓	✓	✓
Water—100% of the population in Lyndeborough has private well water.	Structures valuable to water supply	✓	✓		✓					

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Communications — Highway Department Communications Tower	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications— Woodward Road Cell Tower	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications—Center Road Telephone Substation	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – Citizen’s Hall TDS Substation	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – Sharp Road TDS Substation	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – Citizen’s Hall FCC Licensed Emergency Communications Tower	Structure valuable to communications		✓			✓	✓	✓	✓	✓

Table 6.5—High Potential Hazard Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Name - Mill Brook Dam # D147003 Hazard Class—NM Water body—Mill Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Curtis Brook Dam #D147013 Hazard Class—L Water body—Curtis Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	

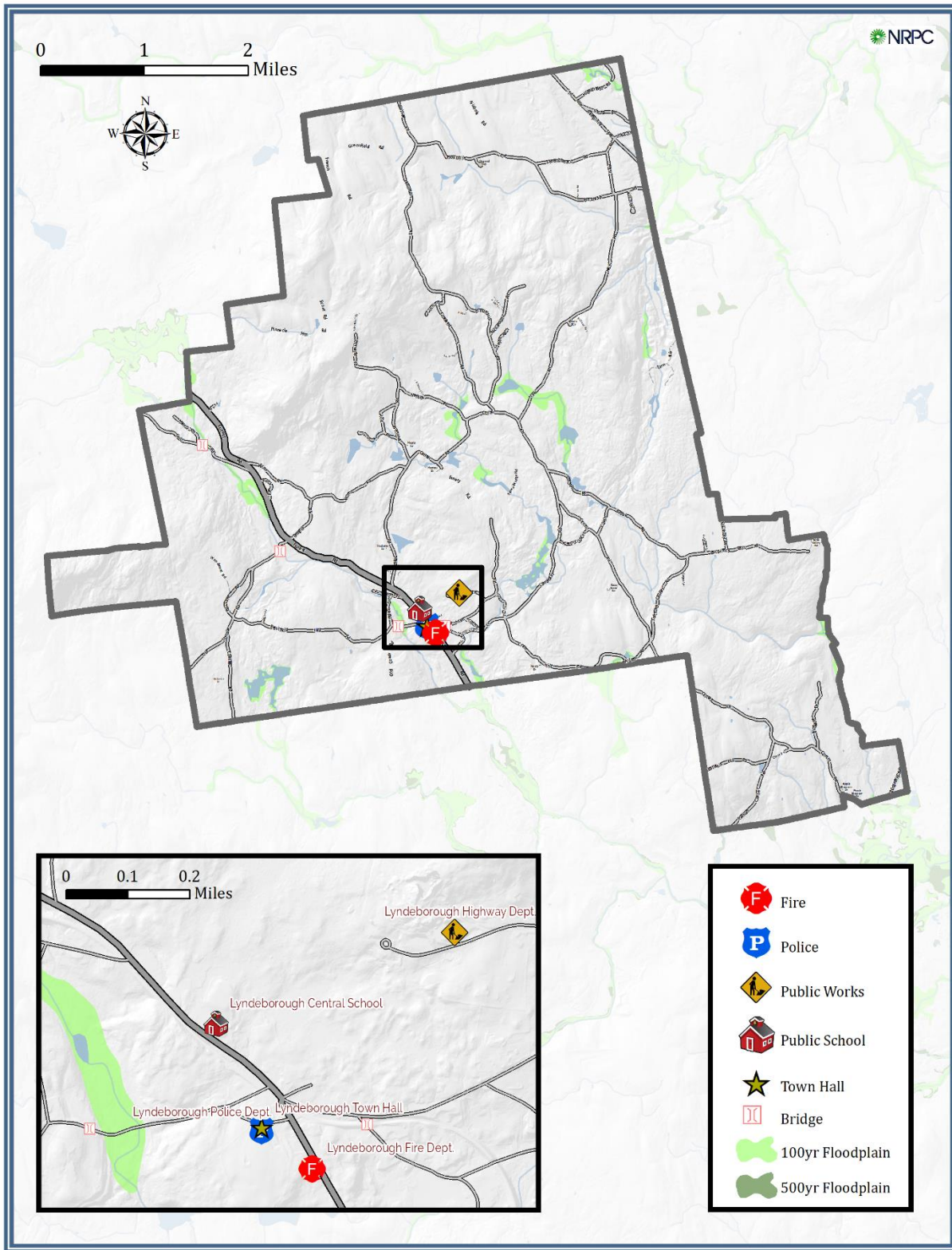
Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Name – Purgatory Brook Dam #D147014 Hazard Class—NM Water body—Purgatory Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Burton Pond Dam #D147017 Hazard Class—L Water body—TR Stony Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Fish Pond Dam #D147020 Hazard Class—NM Water body—Unnamed Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Fire Pond Dam #D147021 Hazard Class—NM Water body—Unnamed Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Bersen Wildlife Pond Dam #D147024 Hazard Class—NM Water body—Unknown Stream	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Souhegan River Site 28 Dam #D147026 Hazard Class—H Water body—TR Stony Brook Owner – NH DES Water Division	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Souhegan Site 8 Dam #D147028 Hazard Class—H Water body—Furnace Brook Owner – NH DES Water Division	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Name – Morison Pond Dam #D147029 Hazard Class—NM Water body—TR Souhegan River Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name - Fire Pond Dam #D147030 Hazard Class—NM Water body—Unnamed Stream Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Swartz Pond Dam #D147031 Hazard Class—L Water body—TR Stony Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name - Farm Pond Dam #D147032 Hazard Class—NM Water body—Philip Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Farm Pond Dam #D147033 Hazard Class—NM Water body—Unnamed Stream Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Souhegan Site 8 Cemetery Dike #D147036 Hazard Class—L Water body—TR Souhegan River Owner – NH DES Water Division	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name - Souhegan Site 8 South Dike # D147037 Hazard Class—L Water body—TR Souhegan River Owner – NH DES Water Division	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
Name – Curtis Brook Dam #D14038 Hazard Class—L Water body—Curtis Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Scott Brown Dam #D147039 Hazard Class—NM Water Body – Unknown Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	
Name – Simoni Recreation Dam #D147040 Hazard Class—NM Water body—Unnamed Brook Owner – Privately Held	Structure valuable to flood control, located in 1% floodplain		✓		✓	✓		✓	✓	

Table 6.6—Hazardous Materials Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightening	Severe Winter Weather	Tornado	Wildfire
There are no Hazardous Materials Facilities in Lyndeborough as reported by the EPA Toxics Release Inventory Program.										



Section 3.5 ~ Vulnerability by Hazard

Climate Change

Climate change in southern New Hampshire will impact the environment, ecosystem services, economy, public health, and quality of life. According to a 2014 study by the Sustainability Institute at the University of NH, southern NH is expected to become warmer and wetter over the next century with more extreme precipitation events. This weather pattern puts significant stress on the region's already aging water infrastructure. Furthermore, climate change is likely to cause a number of public health impacts on NH's most vulnerable residents, including heat stress; flood related deaths and injuries; respiratory and cardiovascular illness, including asthma; allergies; vector, food, and water-borne disease; chronic disease; and mental health and stress-related disorders. Despite efforts taking place to slow the rate of climate change, some level of change is inevitable. Therefore, municipalities must make sound decisions to help their communities adapt to a new climate normal.

Temperatures in southern New Hampshire will continue to rise under a lower or higher future emissions scenario. In the short-term (2010-2039), average annual temperatures are predicted to increase by approximately 2°F. Under a higher emissions scenario, long-term (2070-2099) average annual temperatures are predicted to increase by 8 to 9°F. If a lower emissions scenario is achieved, long-term average annual temperatures are predicted to increase by 4°F (Wake et al., "Climate Change in Southern New Hampshire," pg. 23). The region is also predicted to experience more extreme heat events. From 1970-1999, southern New Hampshire had an average of seven days above 90°F each year. In the long-term under a higher emissions scenario, southern New Hampshire is predicted to have over 54 days per year above 90°F. Under a lower emissions scenario, the region is predicted to have 23 days per year above 90°F in the long-term (Wake et al., "Climate Change in Southern New Hampshire," pg. 25).

Annual average precipitation is predicted to increase 17-20% in southern New Hampshire by the end of the century under both the low and high emissions scenarios. Larger increases in precipitation are expected in the winter and spring, while summer and fall will only experience slight increases (Wake et al., "Climate Change in Southern New Hampshire," pg. 29). Southern New Hampshire can also expect more extreme precipitation events, defined as those where more than 1 inch of rain falls within 24 hours or more than 2-4 inches falls in 48 hours. Under both low and high emissions scenarios, the frequency of extreme precipitation events is predicted to more than double by the end of the century (Wake et al., "Climate Change in Southern New Hampshire," pg. 29).

The frequency of short-term drought (1-3 months) in New Hampshire is predicted to increase 2-3 times in the long term (2070-2099) under the higher emissions scenario. The state will experience a more significant increase in medium-term drought (3-6 months) during this period. Short and medium-term droughts are primarily caused by evapotranspiration as a result of hotter summers. The frequency of long-term drought (6 plus months) does not change significantly in the future under the low or high emissions scenario compared to past long-term drought events in New Hampshire (Wake et al., "Climate Change in Southern New Hampshire," pg. 30-31).

Climate Change Hazard Loss Estimate

Because the impacts of climate are wide ranging and have little historic data to draw from, it is beyond the scope of this Plan to estimate the dollar value of losses to the municipality resulting from climate change.

Some insights on the municipality's vulnerability to climate change may be gained by examining the results of the Nashua Region Water Vulnerability Assessment, conducted by the Nashua Regional Planning Commission in 2016. Based on the results of the vulnerability assessment, the Nashua Region is most vulnerable to threats related to warmer temperatures and threats that affect water supply.

Threats related to warmer temperatures are highly likely to occur, are broad ranging, have critical severity, and moderately effective mitigation options. In addition, while the region has experience with flooding (and drought to a smaller extent), the region has no experience with warming temperatures to provide historical guidance.

Threats that affect water supply are likely to occur, have moderate to critical severity, will likely affect between 10 and 50% of the region's population, and have moderately effective mitigation options. There are numerous threats in this category, and they have broad implications from public health and safety to agriculture and the economy.

It may also be helpful to review the Drought, Extreme Temperatures, and Flooding sections in this Plan for more insight on the municipality's vulnerability to climate change.

Drought

Hydrological drought is evidenced by extended periods of negative departures from normal rainfall. New Hampshire has been under several drought warnings, including a drought emergency, since 1999. The most severe drought conditions occurred between 1960 and 1969; the event had a greater than 25-year recurrence interval. The southern New Hampshire region experienced a 100-year drought event from 1964 to 1965.

Southern New Hampshire also experienced a 50-year drought event beginning in May 2015 and lasting through April 2017. During that time, Lyndeborough experienced drought levels from USDA D0 (Abnormally Dry) to USDA D3 (Extreme Drought).

Although drought is not likely to damage structures, low water levels can have a negative impact on existing and future home sites, especially those that depend on groundwater for water needs. Additionally, the dry conditions of a drought may lead to an increase wildfire risk. Drought can cause the most significant impact to agricultural land and assets.

Drought Hazard Loss Estimate

Because the impacts of drought are long lasting and wide ranging, it is beyond the scope of this Plan to estimate the dollar value of losses to Lyndeborough resulting from drought. Instead, the Hazard Mitigation Team estimated the percentage of land in Lyndeborough vulnerable to drought and the percentage of the population vulnerable to drought as a quantitative measure of this hazard's impact.

Total Acres of Land in Lyndeborough	Total Acres of Agricultural Land in Lyndeborough	% of Land in Lyndeborough Vulnerable to Drought
19,520	1,152	5.9%

% of population with Public Drinking Water in Lyndeborough	% of population with Private Well Water in Lyndeborough	Water Utility	Primary Water Source	Secondary Water Source
0%	100%	N/A	Private Wells	N/A

Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Drought Hazard Area	Percentage of this type of Critical Facilities in Drought Hazard Area
General Occupancy	16	16	100%
Essential Facilities	5	5	100%
Transportation	7	0	0%
Utility System	8	1	12.5%
High Potential Hazard	19	0	0%
Hazardous Materials	0	0	0%

Earthquake

An earthquake is a sudden and violent shaking of the ground, sometimes causing great destruction, as a result of movements within the earth's crust or volcanic action. The Richter magnitude scale was developed by Charles F. Richter in 1935 as a way to compare the size of earthquakes. The magnitude of an earthquake is calculated from the logarithm of the amplitude of waves recorded by seismographs.

- Magnitude <2.0—micro-earthquakes. Recorded by seismographs, but not felt or rarely felt by people. Several million occur annually worldwide on average.
- Magnitude 2.0-2.9—felt slightly by some people. No damage to buildings. Over 1 million occur annually worldwide on average.
- Magnitude 3.0-3.9—often felt by people but very rarely cause damage. Shaking of indoor objects can be noticeable. Over 100,000 occur annually worldwide on average.
- Magnitude 4.0-4.9—noticeable shaking of indoor objects and rattling noises. Felt by most people in affected area. Generally causes minimal to no damage. Moderate to significant damage is very unlikely. 10,000-15,000 occur annually worldwide on average.
- Magnitude 5.0-5.9—felt by everyone. Can cause damage of varying severity to poorly constructed buildings; slight to no damage to all other buildings. Few, if any, casualties. 1,000-1,500 occur annually worldwide on average.
- Magnitude 6.0-6.9—felt up to hundreds of miles from epicenter. Strong to violent shaking in epicenter. Damage to many buildings in populated areas. Poorly designed structures have moderate to severe damage. Earthquake-resistant structures have slight to moderate damage. Damage can be caused far from epicenter. Death toll up to 25,000. 100-150 occur annually worldwide on average.

- Magnitude 7.0-7.9—felt in very large area. Damage to most buildings, including partial or complete collapse. Death toll up to 250,000. 10-20 occur annually worldwide on average.
- Magnitude 8.0-8.9—felt in extremely large region. Major damage to buildings over large areas. Structures likely destroyed. Moderate to heavy damage to sturdy or earthquake-resistant buildings. Death toll up to 1 million. 1 occurs annually worldwide on average.
- Magnitude 9.0+ —damage and shaking extends to distant locations. Near or total destruction. Severe damage and collapse to all buildings. Permanent changes in ground topography. 1 occurs every 10-50 years worldwide on average.

Since 1940, there have been 14 earthquakes centered in NH with a magnitude of 3.0 or greater and only two earthquakes with a magnitude of 5.0 or greater. There have been no recorded earthquakes to-date centered in Lyndeborough, however, one could occur.

Earthquake Hazard Loss Estimate

Step 1. Determine potential earthquake strength in Lyndeborough

- US Seismic Hazard, 2% in 50 years PGA is 0.2 to 0.3(g) in Lyndeborough
- Source: [USGS NH Seismic Map 2014](#)

Step 2. Determine percent building damage ratio to single family residence from PGA (g) 0.25 earthquake

- Wood Frame Construction with Low general seismic design level = 4.6% building damage
- Source: [FEMA Identifying Hazards and Estimating Losses](#), pg 4-17

Step 3. Determine percent of structures in Lyndeborough that would be damaged by PGA (g) 0.25 earthquake

- 1-5% of structures estimated to be damaged by earthquake
- Source: *Lyndeborough Hazard Mitigation Team (no historical data on earthquake damage in Lyndeborough)*

Step 4. Determine total assessed value of structures in Lyndeborough

- Total Assessed Value of all Structures in Lyndeborough = \$97,720,600
- Source: *Lyndeborough Assessing Department (2019)*

Step 5. Determine total loss from PGA (g) 0.25 Earthquake

- Total Loss from Earthquake = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Earthquake = \$97,720,600 * .01 * .046 = \$44,951.48
- Total Loss from Earthquake = \$97,720,600 * .05 * .046 = \$224,757.38
- **\$44,951.48 to \$224,757.38**

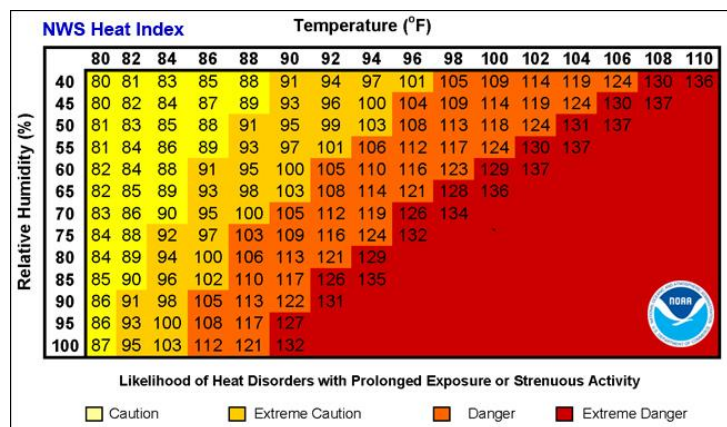
Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Earthquake Hazard Area	Percentage of this type of Critical Facilities in Earthquake Hazard Area
General Occupancy	16	16	100%
Essential Facilities	5	5	100%
Transportation	7	7	100%
Utility System	8	8	100%
High Potential Hazard	19	19	100%
Hazardous Materials	0	0	0%

Extreme Temperatures

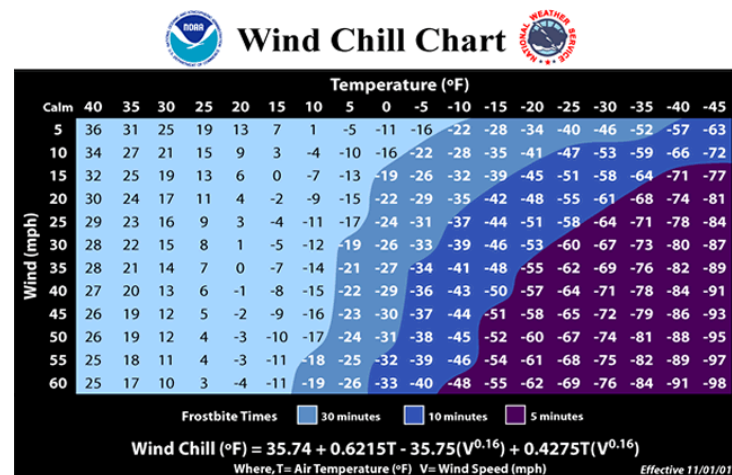
Extreme temperatures can be broken into both extreme heat and extreme cold. Though the hazards are different, the effects would be similar to vulnerable populations in Lyndeborough.

A heat wave can be defined as a prolonged period of excessive heat, often combined with excessive humidity. Heat kills by pushing the human body beyond its limits. The risk of heat-related illness increases as temperature and humidity levels rise. Extreme heat events can be defined as periods with temperatures of 90 degrees Fahrenheit or higher.

Extreme heat should not be confused with a drought (extended periods of negative departures from normal rainfall). Overburdened power networks may experience failures due to the impacts of extreme heat. The National Weather Service (above) illustrates the probability of heat disorders with prolonged exposure or strenuous activity.



Extreme cold is defined as an extended period where temperatures are at or below 0 degrees Fahrenheit. With the rising costs of heating fuel and electric heat, many low-income or homeless citizens are not able to adequately heat their homes, exposing themselves to cold related emergencies or death. Extremely cold winters can lead to shortages in heating fuels due to high demand. The National Weather Service Windchill Chart (right) depicts the dangers of freezing temperatures and winds.



Extreme Temperatures Hazard Loss Estimate

Because the impacts of extreme temperatures can result in the loss of life, it is beyond the scope of this Plan to estimate the dollar value of losses to Lyndeborough resulting from extreme temperatures. Though the entire Lyndeborough population may experience a thermal emergency, populations without adequate climate control are most at risk. Extreme temperatures are not likely to cause damage to structures, although pipes can burst in extreme cold conditions.

Flooding

Special flood areas are defined as the 100-year or 1% annual floodplain. These are areas with a 1% annual chance of flood or the probability of one flood every 100 years. Special flood areas also include the 500-year or 0.2% annual floodplain. In these areas there is a 0.2% annual chance of flood, or the probability of one flood every 500 years. Special flood areas are the most likely places to experience flooding in a municipality.

Localized Flooding

Localized flooding can result from even minor storms. Runoff overloads the drainage ways and flows into the streets and low-lying areas. Homes and businesses can be inundated, especially basements and the lower part of first floors. Localized flooding poses most of the same problems caused by larger floods, but because it typically has an impact on fewer people and affects small areas, it tends to bring less State or Federal involvement such as funding, technical help, or disaster assistance. As a result, the community and the affected residents or business owners are left to cope with the problems on their own. Finally, flooding of this type tends to recur; small impacts accumulated over time can become major problems.

Riverine Flooding

Riverine flooding involves the overflowing of normal flood channels, rivers or streams, generally as a result of prolonged rainfall or rapid thawing of snow cover. The lateral spread of floodwater is largely a function of the terrain, becoming greater in wide, flat areas, and affecting narrower areas in steep terrain. In the latter cases, riparian hillsides in combination with steep declines in riverbed elevation often force waters downstream rapidly, sometimes resulting in flash floods.

Floodplains cover approximately 1.86% of Lyndeborough; 1.76% of Lyndeborough is located in 1% annual floodplain and 0.1% of Lyndeborough is located in the 0.2% annual floodplain.

Dam Failure

The NH Department of Environmental Services indicates several failure modes for dams. Most typical include hydraulic failure or the uncontrolled overflowing of water, seepage, or leaking at the dam's foundation or gate; structural failure or rupture; general deterioration; and gate inoperability. These modes vary between dams depending on their construction type.

The State of New Hampshire uses a hazard potential classification to define the extent of a dam breach or failure. All class S (Significant) and H (High hazard) dams have the potential to cause damage if they breach or fail.

Class H—high hazard: dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probably 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 that is occupied under normal conditions; water levels rising above 1st floor elevation of a habitable residential structure or a commercial or industrial structure that is occupied under normal conditions when the rise due to dam failure is greater than 1 foot; structural damage to an interstate highway, which could render the roadway impassible or otherwise interrupt public safety services; release of a quantity and concentration of material that qualify as “hazardous waste” under RSA 147-A:2 VII; any other circumstance that would more likely than not cause one or more deaths.

Class S—significant hazard: dam has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: no probably loss of lives; major economic loss to structures or property; structural damage to a Class I or Class II road that would render the road impassable or otherwise interrupt public safety services; major environmental or public health losses.

Class L—low hazard: dam 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 impassible or otherwise interrupt public safety service; 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; reversible environmental losses to environmentally-sensitive sites.

Class NM—non-menace: 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 6 feet in height if it has a storage capacity greater than 50 acre-feet; or less than 25 feet in height if it has a storage capacity of 15-50 acre-feet.

Lyndeborough has 11 Class NM dams (Non-Menace), 6 Class L dams (Low hazard potential), 0 Class S dams (Significant hazard potential), and 2 Class H dams (High hazard potential).

Most of Lyndeborough’s Dams have either a non-menacing or low hazard classification, which means that they have a relatively low hazard potential because of their size and location. Failure or misoperation of any number of these dams would not result in an economic loss to structures and property and no probable loss of lives.

Two of Lyndeborough’s Dams have a high hazard classification, which could potentially result in loss of life in the case of structural failure or misoperation. However, to date there is no history of dam failure in Lyndeborough making it a rare occurrence and minimal risk.

Flood Hazard Loss Estimate

Step 1. Determine percent building damage to a 1 or 2 story building with basement

- 1-foot flood depth = 15% building damage
- 2-foot flood depth = 20% building damage
- 3-foot flood depth = 23% building damage
- 4-foot flood depth = 28% building damage
- *Source: FEMA Identifying Hazards and Estimating Losses, pg 4-13*

Step 2. Determine number of structures in Lyndeborough located in the floodplain

- 3 structures located in 1% floodplain
- 0 structures located in 0.2% floodplain
- *Source: Nashua Regional Planning Commission http://data-nashuarpc.opendata.arcgis.com/datasets/98afc8bbe9a14c5494c87cc92480b4b1_0*

Step 3. Determine total value of structures in Lyndeborough located in 1% floodplain

- Average assessed value of all structures in Lyndeborough = \$142,866
- Total number of structures in Lyndeborough located in 1% floodplain = 3
- Total assessed value of all structures in Lyndeborough in 1% floodplain = \$167,500
- *Source: Lyndeborough Hazard Mitigation Team calculations based on Lyndeborough Assessing data & NRPC GIS data*

Step 4. Determine total loss from flooding in 1% floodplain

- Total Loss from Flooding = Total Assessed Value of all structures in 1% Floodplain * Percent Building Damage Ratio
- Total Loss from 1-foot flood depth = \$167,500.00 * .15 = **\$25,125.00**
- Total Loss from 2-foot flood depth = \$167,500.00 * .20 = **\$33,500.00**
- Total Loss from 3-foot flood depth = \$167,500.00 * .23 = **\$38,525.00**
- Total Loss from 4-foot flood depth = \$167,500.00 * .28 = **\$46,900.00**

Step 5. Determine total value of structures in Lyndeborough located in 0.2% floodplain

- Average assessed value of all structures in Lyndeborough = \$0.00
- Total number of structures in Lyndeborough located in 0.2% floodplain = 0
- Total assessed value of all structures in Lyndeborough in 0.2% floodplain = \$0.00 * 0
- Total assessed value of all structures in Lyndeborough in 0.2% floodplain = \$0.00
- *Source: Lyndeborough Hazard Mitigation Team calculations based on Lyndeborough Assessing data & NRPC GIS data*

Step 6. Determine total loss from flooding in 0.2% floodplain

- Total Loss from Flooding = Total Assessed Value of all structures in 0.2% Floodplain * Percent Building Damage Ratio
- Total Loss from 1-foot flood depth = \$0.00 * .15 = **\$0.00**
- Total Loss from 2-foot flood depth = \$0.00 * .20 = **\$0.00**
- Total Loss from 3-foot flood depth = \$0.00 * .23 = **\$0.00**

- Total Loss from 4-foot flood depth = \$0.00 * .28 = **\$0.00**

Critical Facility Type	Total Number of this type of Critical Facility in Lyndeborough	Number of this type of Critical Facility vulnerable to flooding	Percentage of this type of Critical Facility vulnerable to flooding
General Occupancy	16	0	0%
Essential Facilities	5	0	0%
Transportation	7	7	100%
Utility System	8	1	13%
High Potential Hazard	19	19	100%
Hazardous Materials	0	0	0%

Severe Wind

The Atlantic hurricane season lasts from June 1 through November 30 and peaks in late August and September. The Saffir-Simpson Hurricane Wind Scale categorizes hurricanes from 1 to 5 based on sustained wind speed. The National Weather Service National Hurricane Center provides the following estimates of potential property damage based on hurricane wind speed

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

Category 1—sustained winds 74-95 mph. 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 likely will result in power outages that could last a few to several days.

Category 2—sustained winds 96-110 mph. 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—sustained winds 111-129 mph. 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 will be unavailable for several days to weeks after the storm passes.

Category 4—sustained winds 130-156 mph. 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—sustained winds 157 mph 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 possible months. Most of the area will be uninhabitable for weeks or months.

FEMA declared disasters in Hillsborough County during Hurricane Bob (1991) and Hurricane Floyd (1999). Though these were the only formally declared incidents, Lyndeborough has experienced strong remnants of numerous tropical cyclones including Hurricane Carol (1954), Donna (1960), Gloria (1985), Irene (2011), and Sandy (2012).

Severe Wind Hazard Loss Estimate

There are no standard loss estimation models or tables for wind damage (*Understanding Your Risks*, FEMA, pg 4-30). As such, the Hazard Mitigation Team used data from previous hurricane events to determine damage estimates. Historically, the strongest hurricane seen in NH was a Category 3, so loss estimates were calculated based on a hurricane of that strength. Hurricanes have primarily damaged road networks and infrastructure in NH. It is beyond the scope of this project to estimate the costs of repairing or replacing transportation and utility infrastructure damaged by a hurricane. The Hazard Mitigation Team used the following calculations to estimate loss to single family residential structures from a hurricane.

Step 1. Determine percent building damage ratio to single family residence from Category 3 hurricane

- Wood Frame Construction, Low general hurricane design level = 20% building damage
- *Source: Lyndeborough Hazard Mitigation Team*

Step 2. Determine percent of structures in Lyndeborough that would be damaged by Category 3 hurricane

- 5% of structures estimated to be damaged by Category 3 hurricane
- *Source: Lyndeborough Hazard Mitigation Team (no historical data on hurricane damage in Lyndeborough)*

Step 3. Determine total assessed value of structures in Lyndeborough

- Total Assessed Value of all Structures in Lyndeborough = \$97,720,600
- *Source: Lyndeborough Assessing Department (2019)*

Step 4. Determine total loss from Category 3 hurricane

- Total Loss from Hurricane = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Hurricane = \$97,720,600 * .05 * .2 = **\$977,206**

Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Severe Wind Hazard Area	Percentage of this type of Critical Facilities in Severe Wind Hazard Area
General Occupancy	16	16	100%

Essential Facilities	5	5	100%
Transportation	7	7	100%
Utility System	8	7	88%
High Potential Hazard	19	19	100%
Hazardous Materials	0	0	0%

Lightning

By definition, all thunderstorms contain 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. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction causes a shock wave that we hear as thunder.

Lightning is a major hazard to citizens involved in outdoor activities. A lightning strike at a densely attended special event has the potential to create a major mass casualty incident. Lightning also can create wildfires and structure fires and may cause power and/or communications outages.

The Lightning Activity Level (LAL) grid can be used to measure the extent of a lightning event.

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 or 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.	9-15

Lightning Hazard Loss Estimate

Losses from lightning would be on a small, localized scale. The Hazard Mitigation Team used the following calculations to estimate loss to single family residential structures from lightning.

Step 1. Determine percent building damage ratio to single family residence from lightning

- Wood Frame Construction = 5% building damage
- *Source: Lyndeborough Hazard Mitigation Team*

Step 2. Determine percent of structures in Lyndeborough that would be damaged by lightning

- 0.25% of structures estimated to be damaged by lightning
- *Source: Lyndeborough Hazard Mitigation Team (no historical data on lightning damage in Lyndeborough)*

Step 3. Determine total assessed value of structures in Lyndeborough

- Total Assessed Value of all Structures in Lyndeborough = \$97,720,600
- *Source: Lyndeborough Assessing Department (2019)*

Step 4. Determine total loss from lightning

- Total Loss from Lightning = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Severe Thunderstorm = \$97,720,600 * .0025 * .05 = **\$12,215.08**

Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Lightning Hazard Area	Percentage of this type of Critical Facilities in Lightning Hazard Area
General Occupancy	16	16	100%
Essential Facilities	5	5	100%
Transportation	7	3	43%
Utility System	8	7	88%
High Potential Hazard	19	0	0%
Hazardous Materials	0	0	0%

Severe Winter Weather

A heavy snowstorm is generally considered to be one that deposits two or more inches of snow per hour in a twelve-hour period. Heavy snow can immobilize a region, stranding commuters, closing businesses, and disrupting emergency services. Accumulating snow can collapse buildings and knock down trees and power lines. Snow removal from roadways, utility damage, and disruption to businesses can have a significant economic impact on municipalities and residents.

A blizzard is a violent snowstorm with winds blowing at a minimum speed of 35 miles per hour and visibility of less than one-quarter mile for three hours. A Nor'easter is a large weather system traveling from south to north, passing along the coast. As the storm's intensity increases, the resulting counterclockwise winds impact the coast and inland areas in a Northeasterly direction. Winds from a Nor'easter can meet or exceed hurricane force, knocking down trees, utility poles, and power lines.

Ice storms occur when a mass of warm, moist air collides with a mass of cold, arctic air. The less dense warm air rises and the moisture precipitates out in the form of rain. When this rain falls through the colder, more-dense air and comes in contact with cold surfaces, ice forms and can become several

inches thick. Heavy accumulations of ice can knock down trees, power lines, and communications for extended periods of time. Ice Storm extent can be defined by the Sperry-Piltz Ice Accumulation Index:

- 0—minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages
- 1—some isolated or localized utility interruptions are possible, typically lasting on a few hours. Roads and bridges may become slick and hazardous.
- 2—scattered utility interruptions expected, typically lasting 12-24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
- 3—numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1-5 days.
- 4—prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structures. Outages lasting 5-10 days.
- 5—catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed

In recent years, FEMA issued disaster declarations in Hillsborough County for severe winter weather in 1998, 2008, 2010, 2011, 2013, 2015, 2017 and 2018. Among these storms was a rare Nor'easter in late October of 2011 that caused major destruction in Hillsborough and Rockingham Counties. Heavy wet snow fell on trees that had much of their foliage remaining. Many trees could not withstand the extra weight of the snow and collapsed under the stress. Damage was very focused in the southern part of New Hampshire and caused nearly three times the amount of debris that the 2008 ice storm produced.

Severe Winter Weather Hazard Loss Estimate

Severe Winter Weather events have primarily damaged road networks and infrastructure in NH. It is beyond the scope of this project to estimate the costs of repairing or replacing transportation and utility infrastructure damaged by severe winter weather. The Hazard Mitigation Team used the following calculations to estimate loss to single family residential structures from severe winter weather.

Step 1. Determine percent building damage ratio to single family residence from severe winter weather

- Wood Frame Construction, no additional provisions for roof snow loads = 5% building damage
- *Source: Lyndeborough Hazard Mitigation Team*

Step 2. Determine percent of structures in Lyndeborough that would be damaged by severe winter weather

- 1% of structures estimated to be damaged by severe winter weather
- *Source: Lyndeborough Hazard Mitigation Team*

Step 3. Determine total assessed value of structures in Lyndeborough

- Total Assessed Value of all Structures in Lyndeborough = \$97,720,600
- *Source: Lyndeborough Assessing Department (2019)*

Step 4. Determine total loss from Severe Winter Weather

- Total Loss from Severe Winter Weather = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Severe Winter Weather = \$97,720,600 * .01 * .05 = **\$48,860.30**

Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Severe Winter Weather Hazard Area	Percentage of this type of Critical Facilities in Severe Winter Weather Hazard Area
General Occupancy	16	16	100%
Essential Facilities	5	5	100%
Transportation	7	7	100%
Utility System	8	7	88%
High Potential Hazard	19	19	100%
Hazardous Materials	0	0	0%

Tornado/Downburst

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more.

Damage paths can be in excess of 1 mile wide and 50 miles long. Tornadoes are created when cold air overrides warm air, causing the warm air to rise rapidly.

A downburst is a severe localized wind blasting down from a thunderstorm. These 'straight line' winds are distinguishable from tornadic activity by their pattern of destruction and debris. Depending on the size and location of these events, the destruction to property may be devastating. Downbursts fall into two categories. Microbursts cover an area less than 2.5 miles in diameter and macrobursts cover an area at least 2.5 miles in diameter.

Hillsborough County has a higher risk of tornado activity compared to the rest of the State. Between 1961 and 1998 there were 15 known tornadoes in Hillsborough County. The most recent downburst activity occurred on July 6, 1999 in the form of a macroburst in Merrimack, Grafton and Hillsborough Counties. There were two fatalities as well as roof damage, widespread power outages, and downed trees, utility poles and wires.

Tornado Hazard Loss Estimate

There are no standard loss estimation models or tables for tornadoes (*Understanding Your Risks*, FEMA, pg 4-27). As such, the Hazard Mitigation Team used data from previous tornado events to determine damage estimates. Historically, the strongest tornado seen in Hillsborough County was a F2, so loss estimates were calculated based on a tornado of that strength.

Step 1. Determine percent building damage ratio to single family residence from F2 tornado

- Wood Frame Construction, Low general tornado design level = 50% building damage

- *Source: Lyndeborough Hazard Mitigation Team*

Step 2. Determine percent of structures in Lyndeborough that would be damaged by F2 tornado

- 1% of structures estimated to be damaged by F2 tornado
- *Source: Lyndeborough Hazard Mitigation Team (no historical data on tornado damage in Lyndeborough)*

Step 3. Determine total assessed value of structures in Lyndeborough

- Total Assessed Value of all Structures in Lyndeborough = \$97,720,600
- *Source: Lyndeborough Assessing Department (2019)*

Step 4. Determine total loss from F2 Tornado

- Total Loss from Tornado = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Tornado = \$97,720,600 * .01 * .5 = **\$488,603.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Tornado Hazard Area	Percentage of this type of Critical Facilities in Tornado Hazard Area
General Occupancy	16	16	100%
Essential Facilities	5	5	100%
Transportation	7	7	100%
Utility System	8	7	88%
High Potential Hazard	19	19	100%
Hazardous Materials	0	0	0%

Wildfire

Wildfires are fires ignited in grassy or wooded areas. They may be ignited intentionally by humans, naturally through lightning, or accidentally due to spark ignition from sources such as power lines or fireworks. The interface between forested lands and developed lands poses an ongoing threat to property from wildfires. Potential wildfire areas outside of the recommended response time radius from the fire station may pose a higher risk to structures and residents than those located closer to the fire station.

Wildfire Hazard Loss Estimate

Step 1. Determine percent building damage ratio to single family residence from wildfire

- Wood Frame Construction, combustible siding and decking = 20% building damage
- *Source: Lyndeborough Hazard Mitigation Team*

Step 2. Determine percent of structures in Lyndeborough that would be damaged by wildfire

- 0.5% of structures estimated to be damaged by wildfire
- *Source: Lyndeborough Hazard Mitigation Team*

Step 3. Determine total assessed value of structures in Lyndeborough

- Total Assessed Value of all Structures in Lyndeborough = \$97,720,600
- *Source: Lyndeborough Assessing Department (2019)*

Step 4. Determine total loss from Wildfire

- Total Loss from Wildfire = Total Assessed Value of all Structures *Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Wildfire = \$97,720,600 * .005 * .2 = **\$97,720.60**

Critical Facility Type	Total Number of this type of Critical Facilities in Lyndeborough	Number of this type of Critical Facilities in Wildfire Hazard Area	Percentage of this type of Critical Facilities in Wildfire Hazard Area
General Occupancy	16	16	100%
Essential Facilities	5	5	100%
Transportation	7	0	0%
Utility System	8	7	88%
High Potential Hazard	19	0	0%
Hazardous Materials	0	0	0%

Section 3.6 ~ Overall Summary of Vulnerability

This section summarizes the Town of Lyndeborough's vulnerability by hazard and by facility type. The Town of Lyndeborough acknowledges that they are equally at risk to and should address all hazards discussed throughout this chapter and listed below.

Table 7.1—Overall Summary of Vulnerability by Hazard

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
Climate Change	<ul style="list-style-type: none"> General Occupancy Essential Facilities Transportation Utility Systems High Potential Hazard Hazardous Materials Agricultural Land 	See Impacts related to Drought, Extreme Temperatures, and Flooding below.	See Critical Facilities calculations for Drought, Extreme Temperatures, and Flooding below.	See damage estimates for Drought, Extreme Temperature, and Flooding below.	Calculating \$ value of losses is beyond the scope of this Plan (see Section 3.5 Climate Change for explanation)
Drought	<p>Agricultural land.</p> <p>Not likely to have a significant impact on structures themselves, but can have significant impact on people's ability to utilize them.</p>	<p>Loss of crops.</p> <p>Inadequate quantity of drinking water—0% of Lyndeborough population on public drinking water, 100% of Lyndeborough population on private well water.</p> <p>Loss of water for fire protection.</p> <p>Increased risk of fire.</p>	<p>General Occupancy = 100%</p> <p>Essential Facilities = 100%</p> <p>Transportation = 0%</p> <p>Utility Systems = 12.5%</p> <p>High Potential Hazard = 0%</p> <p>Hazardous Materials = 0%</p>	1,152 acres of agricultural land (5.9% of total land area)	Calculating \$ value of losses is beyond the scope of this Plan (see Section 3.5 Drought for explanation)
Earthquake	<ul style="list-style-type: none"> General Occupancy Essential Facilities Transportation Utility Systems High Potential Hazard 	<p>Structural damage or collapse of buildings.</p> <p>Damage or loss of infrastructure, including roads, bridges,</p>	<p>General Occupancy = 100%</p> <p>Essential Facilities = 100%</p>	1-5%	\$44,951.48 to \$224,757.38

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
	<ul style="list-style-type: none"> Hazardous Materials 	railroads, power and phone lines, municipal communications, radio system. Loss of water for fire protection. Risk to life, medical surge.	Transportation = 100% Utility Systems = 100% High Potential Hazard = 100% Hazardous Materials = 0%		
Extreme Temperatures	Not likely to have a significant impact on structures.	Overburdened power networks. Heating fuel shortages. Risk to life from prolonged exposure.	General Occupancy = 0% Essential Facilities = 0% Transportation = 0% Utility Systems = 0% High Potential Hazard = 0% Hazardous Materials = 0%	0%	\$0
Flooding	<ul style="list-style-type: none"> General Occupancy Transportation High Potential Hazard Hazardous Materials 	Water damage to structures and their contents. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, radio system. Environmental hazards resulting from damage.	General Occupancy = 0% in floodplain Essential Facilities = 0% in floodplain Transportation = 100% susceptible to flooding Utility Systems = 13% susceptible to flooding	3 structures in 1% annual floodplain 0 structures in 0.2% annual floodplain	Loss in 1% floodplain: 1-foot flood = \$25,125.00 2-foot flood = \$33,500.00 3-foot flood = \$38,525.00 4-foot flood = \$46,900.00 Loss in 0.2% floodplain: 1-foot flood = \$0.00

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
		Isolation of neighborhoods resulting from flooding.	High Potential Hazard = 100% susceptible to flooding Hazardous Materials = 0% in 1 floodplain		2-foot flood = \$0.00 3-foot flood = \$0.00 4-foot flood = \$0.00
Severe Wind	<ul style="list-style-type: none"> General Occupancy Essential Facilities Transportation Utility Systems High Potential Hazard Hazardous Materials 	<p>Wind damage to structures and trees.</p> <p>Water damage to structures and their contents.</p> <p>Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, radio system.</p> <p>Environmental hazards resulting from damage.</p> <p>Isolation of neighborhoods resulting from flooding.</p>	<p>General Occupancy = 100%</p> <p>Essential Facilities = 100%</p> <p>Transportation = 100%</p> <p>Utility Systems = 88%</p> <p>High Potential Hazard = 100%</p> <p>Hazardous Materials = 0%</p>	5%	\$977,206
Lightning	<ul style="list-style-type: none"> General Occupancy Essential Facilities Transportation Utility System High Potential Hazard Hazardous Materials 	<p>Smoke and fire damage to structures.</p> <p>Disruption to power lines and municipal communications.</p> <p>Damage to critical electronic equipment.</p>	<p>General Occupancy = 100%</p> <p>Essential Facilities = 100%</p> <p>Transportation = 43%</p> <p>Utility Systems = 88%</p>	0.5%	\$12,215.08

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
		Injury or death to people involved in outdoor activity.	High Potential Hazard = 0% Hazardous Materials = 0%		
Severe Winter Weather	<ul style="list-style-type: none"> General Occupancy Essential Facilities Transportation Utility High Potential Hazard Hazardous Materials 	<p>Disruption to road network.</p> <p>Damage to trees and power lines, communications.</p> <p>Structural damage to roofs/collapse.</p> <p>Increase in CO, other hazards.</p>	<p>General Occupancy = 100%</p> <p>Essential Facilities = 100%</p> <p>Transportation = 100%</p> <p>Utility Systems = 88%</p> <p>High Potential Hazard = 100%</p> <p>Hazardous Materials = 0%</p>	1%	\$48,860.30
Tornado/Downburst	<ul style="list-style-type: none"> General Occupancy Essential Facilities Transportation Utility System High Potential Hazard Hazardous Materials 	<p>Wind damage to structures and trees.</p> <p>Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, radio system.</p> <p>Environmental hazards resulting from damage.</p> <p>Medical surge.</p>	<p>General Occupancy = 100%</p> <p>Essential Facilities = 100%</p> <p>Transportation = 100%</p> <p>Utility Systems = 88%</p> <p>High Potential Hazard = 100%</p> <p>Hazardous Materials = 0%</p>	1%	\$488,603.00
Wildfire	<ul style="list-style-type: none"> General Occupancy Essential Facilities 	Smoke and fire damage to structures in	General Occupancy = 100%	0.5%	\$97,720.60

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
	<ul style="list-style-type: none"> Utility System High Potential Hazard Hazardous Materials 	<p>wild land/urban interface.</p> <p>Damage to habitat.</p> <p>Impacts to air quality.</p> <p>Loss of natural resources.</p>	<p>Essential Facilities = 100%</p> <p>Transportation = 0%</p> <p>Utility Systems = 88%</p> <p>High Potential Hazard = 0%</p> <p>Hazardous Materials = 0%</p>		

Table 7.2—Overall Summary of Vulnerability by Facility Type

Note that Climate Change is not included as a hazard in this analysis because its effects on critical facilities are included under the hazards of Drought, Extreme Temperatures, and Flooding.

Facility Type	Total # of facilities	# susceptible to Drought	# susceptible to Earthquake	# susceptible to Extreme Temperatures	# susceptible to Flooding	# susceptible to Severe Wind	# susceptible to Lightning	# susceptible to Severe Winter Weather	# susceptible to Tornado/Downburst	# susceptible to Wildfire
General Occupancy	16	16	16	0	0	16	16	16	16	16
Essential Facilities	5	5	5	0	0	5	5	5	5	5
Transportation	7	0	7	0	7	7	3	7	7	0
Utility	8	1	8	0	1	7	7	7	7	7
High Hazard	19	0	19	0	19	19	0	19	19	0
Hazardous Materials	0	0	0	0	0	0	0	0	0	0

Section 3.7 ~ National Flood Insurance Program

The Town of Lyndeborough participates in the National Flood Insurance Program (NFIP). This provides full insurance coverage based on risk as shown on detailed Flood Insurance Rate Maps (FIRMs).

Lyndeborough joined the NFIP on February 21, 1975. The Town's initial Flood Hazard Boundary Map was also identified on September 25, 2009 as well as its initial Flood Insurance Rate Map. The current effective map date is also September 25, 2009.

Lyndeborough has 0 NFIP policies in force and \$0 of insurance in force. There have been 0 paid losses totaling \$0. Lyndeborough has no repetitive loss properties.

As a participant in the NFIP, communities must agree to adopt a floodplain management ordinance and enforce the regulations found in the ordinance. Lyndeborough has adopted the “Floodplain Management Ordinance,” which establishes a permit system and review procedure for development activities in the designated flood hazard areas of the Town. The regulations in this ordinance overlay and supplement the regulations in the Town of Lyndeborough Zoning Ordinance, Building Code, and Subdivision Regulations and are considered part of the Zoning Ordinance, Building Code, and Subdivision Regulations for purposes of administration and appeals under state law. If any provision of this ordinance differs or appears to conflict with any provision of the Zoning Ordinance or Building Code or other ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall be controlling. This ordinance is part of the site plan review process for all applications before the Town of Lyndeborough. The regulations in this ordinance apply only to lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its “Flood Insurance Study for the County of Hillsborough, N.H.” dated September 25, 2009 or as amended, together with the associated Flood Insurance Rate Maps dated September 25, 2009 or as amended.

The ordinance includes the following sections: Purpose (§I), Establishment (§II), Permits (§III), Construction Requirements (§IV), Water and Sewer Systems (§V), Certification (§VI), Other Permits (§VII), Watercourses (§VIII), Special Flood Hazard Areas (§IX), Variances (§X), and Definitions (§XI).

To demonstrate the Lyndeborough’s continued compliance with NFIP requirements, the Hazard Mitigation Team identified the follow mitigation actions as part of its comprehensive mitigation strategy. These actions also appear in Section 4.2, Table 9—Mitigation Actions.

Table 8—National Flood Insurance Program Mitigation Actions

National Flood Insurance Program Mitigation Actions			
Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
Prepare, distribute, and make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	<ul style="list-style-type: none"> Public Information 	<ul style="list-style-type: none"> Flooding 	<ul style="list-style-type: none"> General Occupancy Essential Facilities
Enhance local officials, builders, developers, local citizens and other stakeholders’ knowledge of how to read and interpret the FIRM.	<ul style="list-style-type: none"> Public Information 	<ul style="list-style-type: none"> Flooding 	<ul style="list-style-type: none"> General Occupancy Essential Facilities

CHAPTER 4 MITIGATION STRATEGY

Section 4.1 ~ Goals and Objectives to Reduce Vulnerabilities to Hazards

The first step in developing a mitigation strategy is to establish goals that reflect what the municipality wishes to achieve through the implementation of its Hazard Mitigation Plan. The Lyndeborough Hazard Mitigation Team established the following goals and objectives, based on its desire to protect the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property. These goals provided the basis for identifying and prioritizing mitigation actions.

Goal 1—Prevent the impacts of natural hazards on the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property whenever possible.

- Objective 1.1—Manage development in known hazard areas to avoid the risks associated with natural hazards.
- Objective 1.2—Plan to incorporate hazard mitigation into capital improvements and other future initiatives.
- Objective 1.3—Ensure building codes and other standards include requirements that make new construction more disaster resistant.
- Objective 1.4—Support the maintenance of this hazard mitigation plan.

Goal 2—Protect the Town's existing critical facilities, infrastructure, and private property from the impacts of natural hazards through cost effective mitigation activities.

- Objective 2.1—Modify existing structures to reduce damage from future natural hazard events.
- Objective 2.2—Perform cost effective flood hazard mitigation measures to protect private property.

Goal 3—Educate and inform the Town's residents to help them become more resilient to natural hazards impacting the community.

- Objective 3.1—Utilize educational methods to change the perception from "disaster losses are acceptable" to "many disaster losses are preventable if mitigation practices are followed."
- Objective 3.2—provide educational opportunities across all age ranges.
- Objective 3.3—Develop and distribute public awareness materials regarding the relative risk of natural hazards and practical mitigation measures to reduce damages and injuries.

Goal 4—become more resilient to the impacts that climate change has on the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property.

- Objective 4.1—Utilize existing documents, including the Nashua Regional Water Resiliency Action Plan (NRPC, 2016) and "Climate Change in Southern New Hampshire" (Sustainability Institute, University of New Hampshire, 2014) to better understand predicted changes in the region's climate.
- Objective 4.2—Conduct a town-specific vulnerability assessment to better understand the municipality's strengths and weaknesses with respect to climate change readiness.

- Objective 4.3—Prioritize which climate change impacts to address and when. Prioritization could be based on vulnerability assessment results, current needs, upcoming plans, feasibility, or budget considerations.
- Objective 4.4—Develop an adaptation strategy, including potential mitigation measures, timelines, responsible parties, and available funding sources.
- Objective 4.5—Implement the adaptation strategy and incorporate finding into hazard mitigation plan updates.
- Objective 4.6—Track progress and monitor results to determine where improvements can be made. Adjust the implementation strategy as necessary.

Goal 5—Address the challenges of natural resource degradation and the associated increased risk from hazards.

- Objective 5.1—Ensure development in hazard areas does not destroy natural barriers to damage, such as floodplains and vegetation.
- Objective 5.2—Protect or recreate environmental assets to help safeguard the built environment.

Goal 6—Protect emergency services, critical facilities, and other critical capabilities from hazard damage in order for them to remain operational.

- Objective 6.1—Identify critical facilities, infrastructure, and emergency services and their vulnerabilities to natural hazards.
- Objective 6.2— Develop and implement programs to promote hazard mitigation actions that protect the provision of emergency services in Town.
- Objective 6.3—Identify, maintain, and protect evacuation routes from hazard damage so they are usable when needed.

Section 4.2 ~ Mitigation Actions

After establishing goals and objectives to reduce vulnerabilities to each hazard type, the Hazard Mitigation Team identified mitigation actions to achieve these goals. The resulting mitigation actions appear in Table 9 below.

Table 9—Mitigation Actions

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
MITIGATION ACTIONS FROM 2015 PLAN			
Review and update Building Codes, Floodplain Ordinance, and Zoning Regulations. Proactively enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.	<ul style="list-style-type: none"> • Prevention • Property Protection 	<ul style="list-style-type: none"> • Earthquake • Flooding • Severe Wind • Severe Winter Weather • Tornado 	<ul style="list-style-type: none"> • General Occupancy • Essential Facilities
Reduce impacts to roadways during severe winter weather events. Consider widening roadways where possible to allow safe passage of snowplows and vehicles. Continue to work with Eversource to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	<ul style="list-style-type: none"> • Prevention 	<ul style="list-style-type: none"> • Severe Winter Weather • Severe Wind 	<ul style="list-style-type: none"> • Transportation Systems • Utility Systems
NATIONAL FLOOD INSURANCE PROGRAM MITIGATION ACTIONS			
Prepare, distribute, and make available NFIP, insurance, and building codes explanatory pamphlets or booklets by updating with current best practices and floodplain information.	<ul style="list-style-type: none"> • Public Information 	<ul style="list-style-type: none"> • Flooding 	<ul style="list-style-type: none"> • General Occupancy • Essential Facilities
Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM by holding a series of workshops and information sessions.	<ul style="list-style-type: none"> • Public Information 	<ul style="list-style-type: none"> • Flooding 	<ul style="list-style-type: none"> • General Occupancy • Essential Facilities
ADDITIONAL MITIGATION ACTIONS			
Work with Town residents to increase public awareness of methods to reduce water consumption during drought conditions. Utilize innovative outreach methods including the Lyndeborough	<ul style="list-style-type: none"> • Public Education & Awareness 	<ul style="list-style-type: none"> • Drought 	<ul style="list-style-type: none"> • General Occupancy • Essential Facilities

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
Town website, social media accounts, local cable, and local newspapers.			
Inventory of town-wide special needs and at-risk populations for mitigation planning as well as town-wide questionnaire to identify privately maintained social and physical resources available to town officials during an emergency response.	<ul style="list-style-type: none"> • Prevention • Public Information 	<ul style="list-style-type: none"> • Extreme Temperatures • Severe Winter Weather 	<ul style="list-style-type: none"> • Human lives
Educate homeowners of the importance of installing carbon monoxide monitors and alarms.	<ul style="list-style-type: none"> • Prevention • Public Information 	<ul style="list-style-type: none"> • Severe Winter Weather 	<ul style="list-style-type: none"> • Human lives
Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling and warming stations at community centers. Develop targeted outreach methods, including notifying occupants of senior housing facilities.	<ul style="list-style-type: none"> • Prevention • Public Information 	<ul style="list-style-type: none"> • Extreme Temperatures • Severe Winter Weather 	<ul style="list-style-type: none"> • Human lives
Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station.	<ul style="list-style-type: none"> • Property Protection • Emergency Services Protection 	<ul style="list-style-type: none"> • Lightning 	<ul style="list-style-type: none"> • Essential Facilities • Utility System
Sponsor local "slash and clean-up days" to reduce fuel loads along the wildland-urban interface.	<ul style="list-style-type: none"> • Prevention • Property Protection 	<ul style="list-style-type: none"> • Wildfire 	<ul style="list-style-type: none"> • General Occupancy • Essential Facilities

Section 4.3 ~ Prioritizing Mitigation Actions

After identifying mitigation actions to address each hazard, the Team then began a two-step process to prioritize them. The first step was to conduct a benefit cost review. Benefit cost reviews provide a comprehensive overview of the monetary and non-monetary costs and benefits associated with each action. During this process, the Hazard Mitigation Team asked a variety of questions such as, “How beneficial is this action to the entire Town?” “How many people will benefit from this action?” “How large of an area is impacted by this project?” “How costly is this project?”

Table 10—Benefit Cost Review

Mitigation Action	Likely Benefits	Likely Costs
Review and update Building Codes, Floodplain Ordinance, and Zoning Regulations. Proactively enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.	<ul style="list-style-type: none"> This action would be effective at avoiding and reducing future losses. This action is beneficial to all applicable buildings across the entire Town. 	<ul style="list-style-type: none"> This action may not benefit older structures not subject to newer building codes. \$0 additional costs, percentage of existing Code Enforcement budget (source: 2021 Lyndeborough Town budget item)
Inventory of town-wide special needs and at-risk populations for mitigation planning as well as town-wide questionnaire to identify privately maintained social and physical resources available to town officials during an emergency response.	<ul style="list-style-type: none"> Helps vulnerable populations Voluntary participation 	<ul style="list-style-type: none"> May be difficult to get personal contact information Voluntary participation means not everyone would be covered \$750 annually (source: Lyndeborough Operating Budget, Emergency Management appropriation)
Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling and warming stations at community centers. Develop targeted outreach methods, including notifying occupants of senior housing facilities.	<ul style="list-style-type: none"> This action would benefit the entire Town and particularly the most at risk and needy populations. This action has broad social benefits for the community. 	<ul style="list-style-type: none"> \$0 additional costs, percentage of existing Emergency Management budget (source: 2021 Lyndeborough Town budget item)
Educate homeowners of the importance of installing carbon monoxide monitors and alarms.	<ul style="list-style-type: none"> Protects human life during severe winter weather Voluntary participation 	<ul style="list-style-type: none"> Minimal, part of normal Fire Department operations (all volunteer)

Mitigation Action	Likely Benefits	Likely Costs
Work with town residents to increase public awareness of methods to reduce water consumption during drought conditions. Utilize innovative outreach methods including the Lyndeborough Town website, social media accounts, local cable, and local newspapers.	<ul style="list-style-type: none"> This action has environmental benefits if residents comply with reduced water consumption measures 	<ul style="list-style-type: none"> Minimal, part of normal town operations
Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station.	<ul style="list-style-type: none"> Reduced inconvenience and loss associated with a shutdown of critical facilities due to lightning damage. 	<ul style="list-style-type: none"> \$1,000-\$5,000 per critical facility for lightning protection devices (source: Lyndeborough Town General Government Building budget item)
Reduce impacts to roadways during severe winter weather events. Consider widening roadways where possible to allow safe passage of snowplows and vehicles. Continue to work with Eversource to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	<ul style="list-style-type: none"> Trimming trees near power lines would reduce the risk of outages. Fewer trees directly along road would also reduce root systems in roadways, allow more sunlight for better snowmelt, and improve overall road conditions. 	<ul style="list-style-type: none"> Removal of trees along designated scenic roads requires Planning Board approval Tree removal may be incompatible with local aesthetics Burying power lines may be cost prohibitive \$1,200-\$1,500 per large tree for removal (source: 2021 Lyndeborough Town Road Maintenance budget item)
Enhance local officials, builders, developers, local citizens, and other stakeholders' knowledge of how to read and interpret the FIRM by holding a series of workshops and information sessions.	<ul style="list-style-type: none"> Educate residents, builders, and other professionals about NFIP Reduce property loss costs 	<ul style="list-style-type: none"> Minimal, part of normal town operations \$0 additional costs, percentage of existing Code Enforcement budget (source: 2021 Lyndeborough Town budget item)
Sponsor local "slash and clean-up days" to reduce fuel loads along the wildland-urban interface.	<ul style="list-style-type: none"> This action would result in reduced fire-fighting costs. This action would be most beneficial to portions of Town near wooded areas. 	<ul style="list-style-type: none"> Large scale wildfires are relatively rare in Lyndeborough and therefore the costs of implementing this action may outweigh the benefits

Mitigation Action	Likely Benefits	Likely Costs
	<ul style="list-style-type: none"> This action would also be beneficial to mitigate man-made fire related hazards. 	<ul style="list-style-type: none"> of reduced property damage. \$0 additional costs, percentage of existing Fire Dept. and Public Works operational budget (source: 2021 Lyndeborough Town budget item)
Prepare, distribute, and make available NFIP, insurance, and building codes explanatory pamphlets or booklets by updating with current best practices and floodplain information.	<ul style="list-style-type: none"> Educate residents, builders, and other professionals about NFIP Reduce property loss costs associated with flooding 	<ul style="list-style-type: none"> Minimal, part of normal town operations \$500 annually; part of existing Code Enforcement budget (source: 2021 Lyndeborough Town budget item)

After completing a Benefit Cost review for each action, the Hazard Mitigation Team then prioritized the actions by conducting a STAPLEE Analysis, which stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental factors. For each mitigation action, the Team asked the following questions:

- Social— Will the action unfairly affect any one segment of the population? Will it disrupt established neighborhoods? Is it compatible with present and future community values? Will it adversely affect cultural resources?
- Technical—How effective is the action in avoiding or reducing future losses? Will it create more problems than it solves? What are some secondary impacts? Does it solve a problem or only a symptom?
- Administrative— Does the community have the capability to implement the action? Can the community provide the necessary maintenance? Can it be accomplished in a timely manner?
- Political— Is there public support both to implement and maintain the action? Is the political leadership willing to support it? Does it present a financial burden to stakeholders?
- Legal— Does the community have the authority to implement the action? Is enabling legislation necessary? What are the legal side effects? Will the community be liable for the actions, support of actions, or lack of actions?
- Economic— What are the costs of this action? How will the costs be borne? Are state/federal grant programs applicable? Does the action fit into existing capital improvements or economic development budgets?

- **Environmental**— How will this action affect the environment? Does it comply with local, state, and federal environmental regulations? Is it consistent with community environmental goals? Are endangered or threatened species likely to be affected?

The cost and benefit of each mitigation action were then evaluated and assigned a quantitative score based on the STAPLEE criteria.

Benefit Score Range: 0 = Not Beneficial, 1 = Somewhat Beneficial, 2 = Beneficial, 3 = Very Beneficial

Cost Score Range: 0 = Not Costly, -1 = Somewhat Costly, -2 = Costly, -3 = Very Costly

Next, the scores for each action were added to determine priority. Finally, the Hazard Mitigation Team reviewed the scores and resulting prioritization to make sure it was consistent with historical risks, anticipated future risks, current emergency management priorities, and the Town's goals and Master Plan. The STAPLEE analysis and prioritized mitigation actions appear in Table 11 below.

Table 11—STAPLEE Analysis

Mitigation Action: Review and update Building Codes, Floodplain Ordinance, and Zoning Regulations. Proactively enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.			
Criteria	Evaluation	Cost	Benefit
Social	There are not social impacts associated with this action. Enforcement would apply evenly across all applicable buildings, including new construction, major renovations, and changes of use.	0	3
Technical	This action is effective at avoiding and reducing future losses and it mitigates the impacts of these hazards.	0	3
Administrative (including responsible party)	Lyndeborough has the capability to implement this action. Responsibility would fall under the Lyndeborough Building Inspector.	0	3
Political	There is public support for this action. Concerns may exist among some property owners who would be directly impacted.	-1	2
Legal	Lyndeborough has adopted these codes and has the legal authority to enforce them.	0	2
Economic (including direct cost)	There would be no additional costs associated with enforcing building codes, as it falls under the existing Building Inspection budget. This action could have a positive economic impact by reducing the number of emergency response calls.	0	2
Environmental	This action is environmentally beneficial if residents pay attention to and comply with reduced water consumption measures.	0	2
Subtotal	This action has the potential to reduce property damage and subsequent environmental impacts.	-1	17

Total		16
Priority		1

Mitigation Action: Inventory of town-wide special needs and at-risk populations for mitigation planning as well as town-wide questionnaire to identify privately maintained social and physical resources available to town officials during an emergency response.			
Criteria	Evaluation	Cost	Benefit
Social	This is a voluntary program, so it would not affect any one segment of the population. Helping vulnerable populations is compatible with community values.	0	3
Technical	This action is only effective at avoiding or reducing future losses if residents voluntarily participate in it.	0	2
Administrative (including responsible party)	The Town has the capability to implement this action if information is voluntarily provided by residents. The Lyndeborough Fire Chief is responsible for implementing this action.	0	3
Political	There is political support for this action.	0	2
Legal	The Town has the authority to implement this action and no enabling legislation is necessary. Participation in this program is entirely voluntary.	0	2
Economic (including direct cost)	This action would cost roughly \$750 annually. It is consistent with normal town operations and does not impose additional economic costs.	0	3
Environmental	This action would not impact the environment.	0	0
Subtotal		0	15
Total		15	
Priority		2	

Mitigation Action: Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling and warming stations at community centers. Develop targeted outreach methods, including notifying occupants of senior housing facilities.			
Criteria	Evaluation	Cost	Benefit
Social	This action primarily benefits Lyndeborough's most vulnerable residents. It is compatible with present and future community values.	0	2
Technical	This action does not solve the problem of extreme temperatures, but it does solve the symptom of exposure. Extreme temperatures are very likely to occur in Lyndeborough, so mitigation measures are important.	0	2
Administrative (including responsible party)	Lyndeborough has the capability to implement this action. The Lyndeborough Fire Chief is responsible for it and it falls under ongoing emergency management operations. This action can be implemented in a very timely manner.	0	2
Political	There is public support to implement and maintain this action.	0	2
Legal	Lyndeborough has the legal authority to implement this action.	0	2
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs	0	2
Environmental	There are no environmental impacts associated with this action.	0	2
Subtotal		0	14
Total			14
Priority			3

Mitigation Action: Educate homeowners of the importance of installing carbon monoxide monitors and alarms.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	1
Technical	This action does not solve the problem of severe winter weather, but it does solve the symptom of carbon monoxide poisonings and protects human life.	0	3
Administrative (including responsible party)	The Town has the capability to implement this action if information is voluntarily provided by residents. The Lyndeborough Fire Chief is responsible for implementing this action.	0	2
Political	There is political support for this action.	0	2
Legal	There are no legal issues associated with this action.	0	2
Economic (including direct cost)	This action is consistent with normal Fire Department operations and does not impose additional economic costs.	0	3
Environmental	This action would not impact the environment.	0	0
Subtotal		0	13
Total			13
Priority			4

Mitigation Action: Work with town residents to increase public awareness of methods to reduce water consumption during drought conditions. Utilize innovative outreach methods including the Lyndeborough Town website, social media accounts, local cable, and local newspapers.			
Criteria	Evaluation	Cost	Benefit
Social	There are no known social issues associated with this action.	0	2
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to drought rather than the underlying problem itself. It will not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	The administrative difficulty is finding the right forum to distribute the info. The Health Dept. and Welfare Department are the responsible parties.	0	2
Political	Lyndeborough has strictly private wells, which makes enforcement difficult. There would likely be political resistance if the Town started enforcement.	-2	2
Legal	There are no legal issues associated with this action.	0	2
Economic (including direct cost)	This action is consistent with normal Town Health Department operations and does not impose additional economic costs.	0	2
Environmental	This action is environmentally beneficial if residents pay attention to and comply with reduced water consumption measures.	0	2
Subtotal		-2	14
Total			12
Priority			5

Mitigation Action: Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	1
Technical	This action is effective in avoiding or reducing future losses. It would not create more problems than it solves. It would improve safety for municipal staff and reduce the inconvenience from a shutdown of critical facilities resulting from power outages. However, incidents related to lightning are very rare in Lyndeborough.	0	3
Administrative (including responsible party)	Lyndeborough has the capacity to implement this action. Each critical facility department head is responsible for implementing the installation of lightning protection devices.	0	1
Political	There is political support to implement and maintain this action.	0	1
Legal	Lyndeborough has the authority to implement this action.	0	3
Economic (including direct cost)	The cost of \$1,000-\$5,000 per critical facility for lightning protection devices would come out of the Lyndeborough Operating Budget.	-2	1
Environmental	This action would not impact the environment.	0	2
Subtotal		-2	12
Total			10
Priority			6

Mitigation Action: Reduce impacts to roadways during severe winter weather events. Consider widening roadways where possible to allow safe passage of snowplows and vehicles. Continue to work with Eversource to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population or disrupt established neighborhoods. It is compatible with community values that understand trees need to be trimmed for road maintenance and public safety	0	2
Technical	This action would be effective in avoiding or reducing future losses. It is very likely that a severe winter storm or severe wind event will occur and impact power lines. It would not create more problems than it solves, and it solves the problem rather than only a symptom. Fewer trees directly along the road would also improve drainage, reduce road systems in the roadway, and allow more sunlight to melt the snow, all resulting in better road conditions.	0	2
Administrative (including responsible party)	Lyndeborough has the capacity to implement this action. The Highway Department and Eversource would be the responsible parties.	0	1
Political	In general, there is political support for this action, although there may be some opposition to tree trimming along designated scenic roads.	-1	2
Legal	The Town does not have the authority to trim trees along scenic roads without first receiving approval from the Planning Board. The Board of Selectmen has the legal authority to declare dead trees along a scenic road a public hazard and therefore allow them to be removed.	-2	3
Economic (including direct cost)	Some costs associated with this action would be borne by Eversource. The remaining costs would be borne by the Town. The removal of large trees would cost an estimated \$1,200-\$1,500 per large tree and would be performed by a hired contractor. The removal of small trees would be performed by the Road Agent. The benefits of a more resilient electrical infrastructure far outweigh the costs of this action.	-2	3
Environmental	This action would positively impact the environment by improving road drainage and decreasing the need to use ice melting agents.	0	1
Subtotal		-5	14
Total			9
Priority			7

Mitigation Action: Enhance local officials, builders, developers, local citizens, and other stakeholders' knowledge of how to read and interpret the FIRM by holding a series of workshops and information sessions.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	1
Technical	This action would help to avoid or reduce future losses. It would not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	The Town has the capacity to administer this action. The Lyndeborough Building Inspector is the responsible party.	0	1
Political	There are no political issues associated with this action.	0	1
Legal	There are no legal issues associated with this action.	0	1
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs	0	1
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts only if the specified parties understand and correctly utilize the FIRM.	0	1
Subtotal		0	8
Total		8	
Priority		8	

Mitigation Action: Sponsor local “slash and clean-up days” to reduce fuel loads along the wildland-urban interface.			
Criteria	Evaluation	Cost	Benefit
Social	This action does not unfairly impact any segment of the population and it is compatible with present and future community values. It is most valuable to portions of town near wooded areas.	0	2
Technical	This action helps to avoid or reduce future losses. It has the potential to solve the underlying problem of wildfires by removing the fuel source. It will not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	Lyndeborough has the capability to implement this action, although it poses an additional burden on the Fire Dept. Eversource is responsible for removing underbrush and standing deadwood under power lines.	-1	1
Political	There is public and political support for this action.	0	1
Legal	Lyndeborough has the legal authority to implement this action.	0	1
Economic (including direct cost)	The benefits of reduced fire-fighting costs and potential decrease in property damage could exceed the costs of implementing this action. At the same time, large scale wildfires are relatively rare in Lyndeborough and therefore the costs of implementing this action may outweigh the benefits. It is part of the existing Fire Department budget. Eversource would be responsible for the direct costs of brush removal under power lines.	-1	2
Environmental	Fire is a natural part of the ecosystem and suppressing it may have negative consequences. On the other hand, large-scale, man-made fires can have a detrimental impact on the environment.	0	0
Subtotal		-2	9
Total			7
Priority			9

Mitigation Action: Prepare, distribute, and make available NFIP, insurance, and building codes explanatory pamphlets or booklets by updating with current best practices and floodplain information.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	0
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to flooding than the underlying problem itself. It would not create additional problems or cause secondary impacts. Given that flooding is relatively rare in Lyndeborough, this action would likely have minimal impact.	0	1
Administrative (including responsible party)	Lyndeborough has the capability to implement this action. The Lyndeborough Building Inspector would be responsible for it. It can be accomplished in a timely manner.	0	1
Political	There is public support to implement and maintain this action	0	1
Legal	Lyndeborough has the legal authority to implement this action. The Town's role is only to provide and distribute the materials, not to make actual insurance determinations.	0	0
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs. It would cost \$500 per year to implement and would come out of the Building Inspection budget.	0	0
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts only if the recommendations in the literature are implemented.	0	1
Subtotal		0	4
Total			4
Priority			10

Section 4.4 ~ Implementing and Administering Mitigation Actions

The Town of Lyndeborough has integrated its 2015 Hazard Mitigation Plan into a variety of other planning mechanisms, including the Lyndeborough Emergency Response Plan and Capital Improvements Plan. Updates to Lyndeborough's Capital Improvement Plan will include any applicable mitigation projects identified in the 2021 Hazard Mitigation Plan. In addition, the Town of Lyndeborough has incorporated and will continue to integrate requirements of the Lyndeborough Hazard Mitigation Plan Update 2021 into other planning mechanisms. For example, the next update to the Town's Master Plan will incorporate elements of the Hazard Mitigation Plan where applicable.

The Lyndeborough Hazard Mitigation Team will be responsible for helping Town boards and departments to integrate the Hazard Mitigation Plan into their own planning mechanisms. The Hazard Mitigation Team developed Table 12, which is an action plan that outlines who is responsible for

implementing the prioritized mitigation actions, how they will be funded, and when they will be completed.

Timeframe	
Short Term	1 year or less, or ongoing*
Medium Term	2 -3 years
Long Term	4-5 years

**Ongoing indicates that the action will be completed on an ongoing basis throughout the life of the Plan.*

Table 12—Implementation and Administration

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
1	Review and update Building Codes, Floodplain Ordinance, and Zoning Regulations. Proactively enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.	Building Inspector, Planning Board	Cost = \$0 additional costs, percentage of existing Building Inspector budget Funding Source: Lyndeborough Town budget item	Short Term/Ongoing
2	Inventory of town-wide special needs and at-risk populations for mitigation planning as well as town-wide questionnaire to identify privately maintained social and physical resources available to town officials during an emergency response.	Fire Chief/Emergency Management Director	Cost = This action would cost roughly \$750 annually but is consistent with normal town operations and does not impose additional economic costs. Funding Source: Lyndeborough Town Budget	Short Term
3	Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling and warming stations at community centers. Develop targeted outreach methods, including notifying occupants of senior housing facilities.	Fire Chief/Emergency Management Director	Cost = \$0 additional costs, this action falls under Lyndeborough's existing Fire Department budget Funding Source: Lyndeborough Town budget	Short Term/Ongoing
4	Educate homeowners of the importance of installing carbon monoxide monitors and alarms.	Fire Chief	Cost = \$0 additional costs, this action falls under Lyndeborough's existing Fire Department budget	Short Term

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
			Funding Source: Lyndeborough Town budget	
5	Work with town residents to increase public awareness of methods to reduce water consumption during drought conditions. Utilize innovative outreach methods including the Lyndeborough Town website, social media accounts, local cable, and local newspapers.	Health Department, Welfare Department	Cost = \$0 additional costs, this action falls under Lyndeborough's existing Health and Welfare department budgets Funding Source: Lyndeborough Town Road Maintenance budget	Short Term
6	Protect critical facilities and equipment from lightning damage. Install lightning protection devices at the School. Install and maintain surge protection on critical electronic equipment at Citizens' Hall and Fire Station.	Each Critical Facility Department Head	Cost = \$1,000- \$5,000 per critical facility for lightning protection devices Funding Source: Lyndeborough Town Gen. Gov. Buildings budget item	Short Term/Ongoing
7	Reduce impacts to roadways during severe winter weather events. Consider widening roadways where possible to allow safe passage of snowplows and vehicles. Continue to work with Eversource to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	Highway Department	Cost = \$1,200- \$1,500 per large tree for removal Funding Source: Lyndeborough Town budget item – Highway Town Maintenance	Short Term/Ongoing
8	Enhance local officials, builders, developers, local citizens, and other stakeholders' knowledge of how to read and interpret the FIRM by holding a series of workshops and information sessions.	Building Inspector	Cost = \$0 additional costs, percentage of existing Code Enforcement budget Funding Source: Lyndeborough Town Code Enforcement Budget	Short Term
9	Sponsor local "slash and clean-up days" to reduce fuel loads along the wildland-urban interface.	Fire Department, Highway Department	Cost = \$0 additional costs, percentage of existing Town Budget	Short Term/Ongoing

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
			Funding Source: Lyndeborough Town Budget	
10	Prepare, distribute, and make available NFIP, insurance, and building codes explanatory pamphlets or booklets by updating with current best practices and floodplain information.	Building Inspector	Cost = \$0 additional costs, percentage of existing Code Enforcement budget Funding Source: Lyndeborough Town Code Enforcement Budget	Short Term

CHAPTER 5. PLAN ADOPTION

Section 5.1 ~ Formal Adoption by Governing Body

CERTIFICATE OF ADOPTION

TOWN OF LYNDEBOROUGH, NH BOARD OF SELECMEN

A RESOLUTION ADOPTING THE TOWN OF LYNDEBOROUGH, NH HAZARD MITIGATION PLAN UPDATE 2021

WHEREAS, the Town of Lyndeborough has historically experienced damage from natural hazards and it continues to be vulnerable to the effects of climate change, drought, earthquake, extreme temperatures, flooding, severe wind, lightning, severe winter weather, tornado, and wildfire, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Lyndeborough has developed and received conditional approval from NH Homeland Security & Emergency Management (HSEM) for its Hazard Mitigation Plan Update 2021 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between August 17, 2020 and September 28, 2020 regarding the development and review of the Hazard Mitigation Plan Update 2021; and

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

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

RESOLVED by the Lyndeborough Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Lyndeborough
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.

4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by the Lyndeborough Hazard Mitigation Team.

Adopted this day, the 24 of February, 2021.

Mark A. Chamberlain

Mark Chamberlain, Chairman, Lyndeborough Board of Selectmen

Fred Douglas via phone vote

Fred G. Douglas, Lyndeborough Board of Selectmen

Rick McQuade

Rick McQuade, Lyndeborough Board of Selectmen

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Lyndeborough the 24th of February, 2021.

Rick B. Douglas T/A

Witness

Section 5.2 ~ FEMA Approval Letter



FEMA

March 9, 2021

Meghan Wells, State Hazard Mitigation Planner
New Hampshire Department of Safety, Homeland Security and Emergency Management
33 Hazen Drive
Concord, New Hampshire 03303

Dear Ms. Wells:

As outlined in the FEMA-State Agreement for FEMA-DR-4457, 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 Town of Lyndeborough, New Hampshire Hazard Mitigation Plan Update 2021 and approved it effective **March 8, 2021** through **March 7, 2026** 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 funding will be evaluated according to the eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in this 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 commitment and dedication to risk reduction 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.

Sincerely,

Paul F. Ford
Acting Regional Administrator
DHS, FEMA Region I

PFF:ms

cc: Fallon Reed, Chief of Planning, New Hampshire

Town of Lyndeborough, New Hampshire

Hazard Mitigation Plan Update 2021

Appendix

Hazard Mitigation Team Meeting Agendas & Sign-in Sheets

Notification Letter

Hazard Mitigation Plan Update Website Screen Shot

Hazard Mitigation Team Meeting Agendas & Sign-in Sheets

Lyndeborough Hazard Mitigation Meeting ~ August 17, 2020

Name	Title	Agency	Email
Russ Boland	Town Administrator	Town of Lyndeborough	RBoland@lyndeborough.nh.us
Mark Chamberlain	BOS Chair	"	civilmac@tds.net
Mark Chase	Res Agent	"	M.Chase@lyndeborough.nh.us
Brian Smith	Fire Chief / EMD	"	Bfsmith@tds.net
Ramsford Deware	Police Chief	"	rdeware@lyndeborough.nh.us
Donald Cole	E health officer	"	fire-cole82@hotmail.com

Lyndeborough Hazard Mitigation Meeting ~ August 31, 2020

Name	Title	Agency	Email
Chief Rance Deware	Chief of Police	LPD	rdeware@lyndeboroughnh.us
Mark Chase	Road Agent	LHD	M.Chase@LyndeboroughNH.us
Brian Smith	Fire chief	LFD	ffrsmithevt82@tds.net
Mark Chamberlain	BOS chair	Town	mchamberlain civilmac@tds.net

Lyndeborough Hazard Mitigation Meeting ~ September 14, 2020

Name	Title	Agency	Email
Russ Boland	T/A	Lyndeborough	rboland@lyndeboroughnh.us
Mark Chase	Road Agent	Lyndeborough	mlchase@lyndeboroughnh.us
Brian Smith	Fire Chief	Lyndeborough	bfrsmith@em182.com.net
Ramsford (Rance) Deware	Police Chief	LPD	rdeware@lyndeboroughnh.us
Mark Chamberlain	Bos Chair	Lyndeborough	civilmace@tds.net

Lyndeborough Hazard Mitigation Meeting ~ September 28, 2020

Name	Title	Agency	Email
Russ Boland	T/A	Lyndeborough	rboland@lyndeboroughnh.us
Mark Chamberlain	BoS Chair	"	civilmac@tels.net
Mark Chase	Row Agent	Lyndeborough	M.Chase@LyndeboroughNH.us
Barnsford Deware	Police chief	Lyndeborough	rdeware@lyndeboroughnh.us
Brian Smith	Fire Chief	Lyndeborough	frsmithemt82@tels.net

Notification Letter



August 24, 2020

Eversource
780 N Commercial Street
Manchester, NH 03101

Subject: Town of Lyndeborough NH, Hazard Mitigation Plan Update

Dear Sir or Madam,

The Town of Lyndeborough, NH, in conjunction with the Nashua Regional Planning Commission, is in the process of updating its Hazard Mitigation Plan. All residents, members of the business community, and other interested individuals are welcome to participate in the Plan update process.

The Lyndeborough Hazard Mitigation Plan Update will assess natural hazards that could impact the municipality and will document natural hazards that have occurred since the previous Plan was written. It will also identify critical facilities and infrastructure that are vulnerable to natural hazards and prioritize mitigation actions to protect these critical facilities and infrastructure. In addition, the Plan aims to enhance communication and coordination among municipal departments and to raise awareness of the potential and proactive measures that can be taken to mitigate against natural disasters.

We invite you to follow the Lyndeborough Hazard Mitigation Plan Update process at <http://www.nashuarpc.org/energy-environmental-planning/hazard-mitigation-planning/>. For additional information or to participate in the Plan update, please contact me at cassiem@nashuarpc.org or 603-417-6570 x6578.

Sincerely,

NASHUA REGIONAL PLANNING COMMISSION

Cassie Mullen
Regional Planner II

Hazard Mitigation Plan Update Website Screen Shot



Nashua Regional Planning Comm


+

← → ↺

nashuarpc.org/energy-environmental-planning/hazard-mitigation-planning/

🔍 ☆ 👤 ⋮

NEWSLETTER | CALENDAR | CONTACT |  



NRPC

Nashua Regional Planning Commission

30 Temple Street, Suite 310
Nashua, NH 03060
Phone: 603.417.6570

Value yesterday. Enhance tomorrow. Plan today.

About NRPC | MPO & Transportation Planning | Land Use Planning | Economic Development | GIS & Mapping | Energy & Environmental Planning

Hazard Mitigation Planning

Planning for natural disasters can reduce loss of life, injuries, and property damage. Hazard Mitigation Plans identify critical facilities and areas of concern throughout a municipality, analyze potential natural hazards and risks to these facilities, and prioritize mitigation measures to address the hazards. Municipalities must update their Hazard Mitigation Plans every five years in order to maintain eligibility for federal mitigation grants.

Potential natural hazards in the NRPC region include drought, earthquake, extreme temperatures, flooding, fluvial erosion, hurricane, severe thunderstorm, severe winter weather, tornado, and wildfire.

NRPC is currently working with Lyndeborough, Merrimack, Mont Vernon, and Wilton to update each town's Hazard Mitigation Plan.

▲ Lyndeborough

Meetings

Meeting 1
Date & Time: August 17, 2020 at 7:00pm
Location: Citizen's Hall
[Agenda](#)

Meeting 2
Date & Time: August 31, 2020 at 7:00pm
Location: Citizen's Hall
[Agenda](#)

Meeting 3
Date & Time: September 14, 2020 at 7:00pm
Location: Citizen's Hall
[Agenda](#)

Meeting 4
Date & Time: September 28, 2020 at 7:00pm
Location: Citizen's Hall
[Agenda](#)

▼ Merrimack

▼ Mont Vernon

▼ Wilton