Town of Ashland, New Hampshire
Hazard Mitigation Plan Update, 2013

Prepared by the:

Ashland Hazard Mitigation Update Committee

House on Carr Ave Ashland NH damaged by flood
Credit: Melody ML Waring

month of final FEMA approval 2013

Town of Ashland, New Hampshire
Hazard Mitigation Plan Update

2006
Revised: 2013

With Assistance from:
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Month of Final FEMA approval 2013

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THE LAKES REGION PLANNING COMMISSION

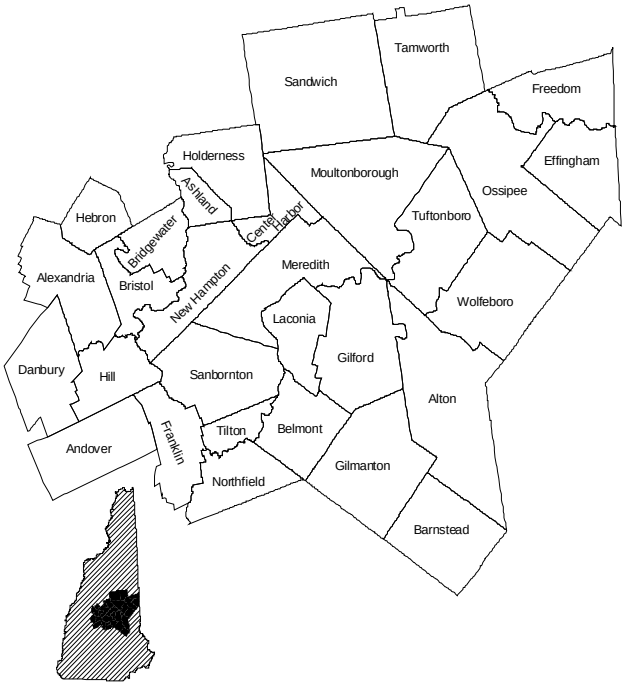

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

The *Ashland Hazard Mitigation Plan Update* (the Plan) serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Ashland Hazard Mitigation Planning Update Committee (the Committee) with assistance from the Lakes Region Planning Commission, and contains statements of policy adopted by the Board of Selectmen in Chapter VI.

After reviewing the various hazards that might impact Ashland, the Committee identified the following high- to medium-risk hazards, both natural and human-related to focus on.

Natural Hazards	Human-Related Hazards
Conflagration	Hazardous Materials in Transport
Lightning	Epidemic
Blizzard/Snow Storm/ Ice Storm	Drinking Water Contamination
Flooding	Bioterrorism
High Winds (Thunderstorm, Tornado/Downburst/Hurricane)	
Earthquake	

Ashland's Critical Facilities include the Fire Station/Emergency Operations Center, Elementary School/Emergency Shelter, Highway Department, and Town Hall, along with the town's infrastructure. The Committee identified numerous existing programs that serve to mitigate hazards including the following:

Existing Plans, Regulations and Practices Supporting Hazard Mitigation	
Ashland Hazard Mitigation Plan 2006	Ashland Subdivision Regulations
Code Enforcement	Ashland Site Plan Review Regulations
Ashland Zoning Ordinance	Ashland Master Plan
Flood Plain Ordinance	School Emergency Operation Plan
Emergency Power Generation	Capital Improvement Planning
Mutual Aid Agreements	Emergency Response Training and Drills

Many of the Actions from the 2006 Plan have either been completed or are no longer pertinent. In its effort to further reduce the vulnerability of the town to future hazards, the committee identified problems and developed a list of 21 general and hazard-specific mitigation actions. These actions were prioritized based on local criteria. Discussions were held regarding how implementation might occur over the next five years. The results of these discussions are summarized in Table 17: Implementation Schedule for Mitigation Actions.

CHAPTER I: PLANNING PROCESS

A. BACKGROUND

In order to be eligible to receive disaster related Federal Emergency Management Agency (FEMA) grant funding to be used for hazard mitigation projects and actions that will ultimately reduce and mitigate future losses from natural or human hazard events, FEMA has required that all communities within the state of New Hampshire establish local hazard mitigation plans. In response to this requirement, the NH Department of Safety's Division of Homeland Security and Emergency Management (HSEM) and the nine regional planning commissions in the state entered into agreements to aid communities with plan development and update. The plan development process followed the steps outlined in Southwest Regional Planning Commission's *Guide to Hazard Mitigation Planning for New Hampshire Communities.*

B. AUTHORITY

The town of Ashland Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning of the Robert T Stafford Disaster Relief and Emergency Assistance Act and Section 104 of the Disaster Mitigation Act (DMA) of 2000. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts.

C. FUNDING SOURCE

The New Hampshire Department of Safety's Homeland Security and Emergency Management (NH HSEM) funded the Plan with matching funds from the Lakes Region Planning Commission.

D. PURPOSE

The Ashland Hazard Mitigation Plan is a planning tool to be used by the town of Ashland, as well as other local, state, and federal government entities, in their efforts to reduce the effects from natural and human-related hazards. The Plan contains statements of policy as outlined in the Implementation Schedule for Mitigation Actions and in Chapter VI: Plan Adoption and Monitoring. All other sections of this plan are support and documentation for informational purposes only and are not included as a statement of policy.

E. SCOPE OF PLAN

The scope of this Plan includes the identification of natural hazards affecting the town of Ashland, as identified by the Committee. The hazards were reviewed under the following categories as outlined in New Hampshire's Natural Hazards Mitigation Plan:

I. **Flood, Wild Land Fire, Drought** (Flood, Dam Failure, Ice Jam, Wildfire, Drought)
II. **Geological Hazards** (Earthquake, Radon, Landslide)
III. **Severe Wind** (Tornado/Downburst, Hurricane, Thunderstorm/Lightning, Hail)
IV. **Winter Weather** (Blizzard/Snow Storm, Ice Storm, Nor'easter, Avalanche).
V. **Other Hazards** (Epidemic, Fire and Hazardous Materials, Terrorism)

F. METHODOLOGY

The Lakes Region Planning Commission (LRPC) met with the NH HSEM field representative for Grafton County and the Ashland Emergency Management Director (EMD) in December of 2011 to initiate the hazard mitigation update process in the town of Ashland. The EMD established the Ashland Hazard Mitigation Planning Update Committee in April 2011 for the purpose of updating a long-range plan for hazard mitigation. The Committee consisted of representatives from the departments of Police, Fire, Highway, Water and Sewer, Electric, the Planning Board, and Board of Selectmen as well as the public. All meetings were open to the public.

Using the *Guide to Hazard Mitigation Planning for New Hampshire Communities*, the Committee developed the content of the Plan by following the process set forth in the handbook, and by referring to FEMA's *Local Multi-Hazard Mitigation Planning Guidance*. The planner and the committee reviewed and referenced a variety of plans, studies, reports, and technical information during the development of this Plan Update; a list of these resources can be found in Appendix J.

The Committee held meetings from April through June, 2011 with additional meetings in June and July, 2012 and February, 2013 in order to review and update the existing plan. The following timeline shows the dates and corresponding Committee actions. The planning team reviewed each section of the plan and LRPC provided updated information on hazards in New Hampshire. Each section of the existing plan was revised and in some cases reformatted to develop a more comprehensive document. Meeting agendas are included in Appendix D. Data on property valuation was supplied by the Town Assessor.

Committee Meetings

April 18, 2011: *Introductory Committee Meeting*
Ashland Town Hall Meeting Room

- Step 1: Overview of update process and objectives
- Step 2: Review community goals and objectives
- Step 3: Locate critical facilities and hazards on map
- Step 4: Review development trends and hazard events since 2007

May 9, 2011: *Committee meeting:*
Ashland Town Hall Meeting Room

- Step 5: Identify all natural and human-related hazards that affect Ashland
- Step 6: Rate probability of occurrence and community vulnerability to hazards
- Step 7: Review Existing Mitigation Programs

May 23, 2011: *Committee meeting*
Ashland Town Hall Meeting Room

- Step 8: Review Status of 2006 Implementation Strategies
- Step 9: Discuss Gaps in Protection

June 13, 2011: *Committee meeting*
Ashland Town Hall Meeting Room

- Step 10: Brainstorm hazard mitigation strategies

June 15, 2012: *Committee meeting*
Town Hall Meeting Room
Review status, update development activity
Step 11: Prioritize Strategies (STAPLEE)

July 6, 2012: *Committee meeting*
Town Hall Meeting Room
Step 12: Discuss Implementation Strategy

April 8, 2013: *Committee meeting*
Town Hall Meeting Room
Review of the draft Plan and update on current status

Public Involvement
The Ashland EMD invited a wide variety of Hazard Mitigation Planning stakeholders to join the Hazard Mitigation Planning Committee. A letter soliciting input to the update process of the Plan was also sent to the Emergency Management Directors in the neighboring towns of Plymouth, Holderness, New Hampton, and Bridgewater. The Committee was well represented by municipal officials and had a citizen member. The Plymouth and New Hampton EMDs did attend some of the early meetings. Local businesses and members of the public were encouraged to attend all meetings through press releases and postings on the town and LRPC websites (Appendix C).

The Committee held a public comment period in order to obtain additional feedback on the draft document. The Plan (including comment instructions) was available for public review at the Ashland Town Hall, the Ashland Public Library, and at the Ashland town website from April 18 - 30, 2013. A press release was distributed to regional media announcing the public comment period (Appendix C). The neighboring towns were also notified of the review period. This provided an opportunity for local and regional businesses, organizations, agencies, educational and health institutions in Ashland and surrounding towns to review and comment on the plan update. Three residents submitted comments which dealt with the correction of a street name, status of local staffing level, and reference to an appendix. One comment related to whether the fire hazard was being appropriately addressed. The EMD, Fire Chief, and Town Administrator reviewed this and confirmed that the concern was properly addressed in the plan.

G. ACKNOWLEDGMENTS

Special thanks to those that assisted in the development of this Plan:

Jeanette Stewart	Ashland Selectmen and Planning Board member
Lee Nichols	Ashland Emergency Management Director and Superintendent of Ashland Electric
Stephen L. Heath	Chief, Ashland Fire Department
Anthony Randall	Chief, Ashland Police Department
Robert Boyle	Commissioner, Ashland Water and Sewer Department
Mark Ober	Ashland Highway Department
Joe Mazzone	Ashland Resident
Tim Paquette	Ashland Public Works Department
Paul Branscombe	Ashland Town Administrator
Pat Tucker	Ashland Town Clerk

Paul Hatch	Field Representative, NH Homeland Security and Emergency Management
Eric Senecal	Regional Planner, Lakes Region Planning Commission
David Jeffers	Regional Planner, Lakes Region Planning Commission

Additional information was provided by:

Philip Bodwell	Ashland Town Assessor
Jennifer Gilbert	Floodplain Management Coordinator, NH Office of Energy and Planning
Nancy McGrath	Programs Information Officer, NH Dam Bureau, NH Department of Environmental Services

Special appreciation is extended to Michael Drake, New Hampton Fire Chief and Emergency Management Director and Casino Clogston, Plymouth Fire Chief, who each attended a planning meeting.

CHAPTER II: COMMUNITY PROFILE

A. GEOGRAPHY

The town of Ashland is located in the geographic center of New Hampshire, in Grafton County, along the east bank of the Pemigewasset River, and at the outflow of the Squam Lake watershed, the second largest lake wholly within New Hampshire. Ashland consists of roughly 11 square miles of land area and half of a square mile of surface water. The town is bordered by Holderness to the north and east, New Hampton to the south, and Bridgewater and Plymouth to the west.

Along with Alexandria, Bridgewater, Hebron, and New Hampton, Ashland has some of the most steeply sloping terrain in the Lakes Region, with 48 percent of the land consisting of slopes of 15 percent or greater. The most developed area of town is located along the Squam River and near its confluence with Ames Brook, which drains Jackson Pond in New Hampton.

B. WEATHER CONDITIONS

Characteristic of the New England region, Ashland's temperatures and precipitation vary greatly. January temperatures range from an average high of 30 degrees Fahrenheit to an average low of 10 degrees Fahrenheit. In July, temperatures range from an average high of 82 degrees Fahrenheit to an average low of 60 degree Fahrenheit. Annual precipitation totals average 40.90 inches. Rainfall is fairly evenly distributed throughout the year. The wettest month of the year is July with an average rainfall of 4.18 inches. Ashland averages about 70-75 inches of snow per year.[1] New Hampshire is in a 160 mile per hour wind zone; the majority of the state (including all of Grafton County) is located in a hurricane susceptible region.

C. PUBLIC RESOURCES

The governing body of the town is an elected three-member Board of Selectmen assisted by a Town Administrator; this is a change from the five selectmen that the town had in 2006. Ashland does have town zoning, which is developed and implemented by the Planning Board and enforced by the Selectmen through the Building Inspector.

The water and sewer department, a town-owned entity which is operated by a private firm, Utility Partners, consists of a wastewater treatment facility, a wellhead area and the infrastructure that delivers water to customers and transports waste to the treatment facility. Generally, the treatment facility receives only sewage; municipal stormwater is captured and channeled separately. The wastewater treatment facility is located at 96 Collins Street. Currently, the facility receives septage from approximately 500 customers.

The wellhead area, where groundwater is drawn and minimally treated before conveyance as potable water to customers, is located at 72 Cedar Lane. Currently, the facility delivers water to approximately 500 customers.

[1] http://www.city-data.com/city/Ashland-New-Hampshire.html , 2012

In 1917, Ashland started its own Electric Department; it has grown into a reliable distribution system, serving nearly 100% of the Town of Ashland with over 1,550 customers. Currently, the Electric Department is not producing power, but instead securing favorable power purchase agreements. The department maintains the capacity to produce hydroelectric power but has not found it to be cost-effective in over 5 years.

The Public Works Department maintains town roads and sidewalks, manages the Transfer/Recycling Facility, provides municipal trash pick up, and maintains Ashland's stormwater infrastructure. The public works building (78 Depot Street), is an 3,900 square-foot facility where most of the department's equipment is stored and maintained. In addition to the full-time Public Works Director, the staff includes four full-time employees.[2]

Speare Memorial Hospital in Plymouth and Lakes Region General Hospital in Laconia serve most of the medical needs of the community. Emergency medical (ambulance) services are contracted out by the town. The town fire department has a part-time chief supported by 30 call firefighters. The town has a full-time police department with four full-time officers, one part-time officer, and two administrative staff. Ashland has an elementary school; middle and high school students attend school in Plymouth. The William J. Tirone Gymnasium at Ashland Elementary School serves as the primary emergency shelter. Plymouth State University serves as a secondary shelter.

Interstate 93 runs along the western edge of Ashland with Exit 24 serving as a major north-south gateway to the town. US Route 3/NH Route 25 provides east-west access to the downtown area from Holderness to Plymouth in the southern portion of town. NH Route 132 runs south from downtown into New Hampton. NH Route 175 runs across the northern tip of Ashland into Plymouth.

D. LAND USE AND DEVELOPMENT TRENDS

According to the US Census, Ashland has experienced slow to moderate growth since 1990, ranking in the lowest quartile in the Lakes Region for net and percent population change. However, Ashland is among the top ten most densely populated towns and among the top eight in housing density of the thirty Lakes Region municipalities, as it is one of smallest towns in the region. As can be seen in Table 1, the 1960s, '70s, and '40s were the periods of greatest growth, while the 1950s and '90s were periods of least growth.

In 2010, there were 1,355 housing units in Ashland, 72 percent occupied and 28 percent vacant. This represents an 18 percent increase in housing units in 2010 compared with 2000 (1,149 units).

Table I. Ashland, NH Population, from Census 1970 - 2010

Year	Population	% Changed
2010	2,076	5.6%
2000	1,965	2.5%
1990	1,917	6.1%
1980	1,807	13.0%
1970	1,599	----

[2] From the draft Ashland Master Plan chapter , *Community Facilities*, LRPC, 2012.

Table II. Ashland Residential Building Permits (2005-2011)[3]

Year	Residential Units
2011	7
2010	7
2009	8
2008	4
2007	37
2006	17
2005	13

There are thirteen locations around Ashland where seasonal traffic counters are placed periodically to track the flow of traffic around town. In all but one location, the volumes measured between 2008 and 2011 were down from the volumes of 2004 – 2006. The volume remained the same along I-93 between exits 23 and 24. The traffic on the Collins Street Bridge was only measured in 2008 and again in 2011; it showed an increase from 80 vehicles per day to 300.

Since the adoption of the 2006 hazard mitigation plan there have been a few changes in the town. There are now three Selectmen. There are 30 on-call firefighters, the same as in 2006; however, the fire chief is now part-time, not volunteer. Some of the development anticipated in the 2006 Plan occurred but much did not. Ashland Lumber did expand and a three-store retail building was constructed and occupied off of Main Street, west of School Street.

[3] *Development Activity in the Lakes Region: 2011 Annual Report,* Lakes Region Planning Commission, 2012 and NH Office of Energy and Planning Annual Survey.

CHAPTER III: RISK ASSESSMENT

A. IDENTIFYING HAZARDS

The town of Ashland is prone to a variety of natural and man-made hazards. The Committee reviewed all of the hazards identified in the 2006 Plan. This plan identified the following hazards events as the greatest threats to the town at that time (Table 3).

Table 3: Hazards identified in the 2006 Hazard Mitigation Plan

Hazard Event	Overall Risk
Flooding	High
Motor Vehicle Accident	High
Winter Weather (Blizzard, Snow Storm, Ice Storm, Nor'easter)	Moderate
Wildfire	Moderate
Earthquake	Moderate

The committee supplemented this by considering all of the hazards identified in the *2010 Multi-Hazard Mitigation Plan*, developed by the New Hampshire Department of Safety's Division of Homeland Security and Emergency Management, for additional hazards that might affect the town.[4] Table 4 provides a state-wide summary of the frequency and severity of these hazards.[5]

Table 4: New Hampshire Hazards Profile

Hazard	Frequency	Severity
Flooding	**High**	**High**
Coastal Flooding	Moderate	Moderate
Dam Failure	*Low*	Moderate
Drought	*Low*	Moderate
Wildfire	**High**	Moderate
Earthquake	*Low*	**High**
Landslide	*Low*	*Low*
Radon	Moderate	*Low*
Tornado/Downburst	Moderate	Moderate
Hurricane	Moderate	**High**
Lightning	Moderate	*Low*
Severe Winter Weather	**High**	**High**
Snow Avalanche	*Low*	*Low*
Epidemic	Moderate	**High**
Fire and Hazardous Materials	Moderate	Moderate
Terrorism	*Low*	Moderate

[4] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-4.pdf , visited April 27, 2011.
[5] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-3.pdf , visited April 27, 2011.

Due to geography, coastal flooding, landslide, and snow avalanche were not considered as locally pertinent. The Committee reviewed historical information from internet sources about past hazard events in and near Ashland. Members also considered the vulnerability of critical facilities and the various other structures in town (Appendix H and Chapter IV). Through this review of state-wide hazards, past regional and local events, and the various structures in town, the committee identified the hazards listed in Table 5 as the most important hazards to the town of Ashland. This list includes all of the elements from the 2006 HMP except for wildfire. Conflagration, epidemic, drinking water contamination, lightning, high winds, and bioterrorism were added to the list.

Table 5: Hazards of Concern: Ashland, NH

Natural Hazards	Human-Related Hazards
Conflagration	Hazardous Materials in Transport
Lightning	Epidemic
Blizzard/Snow Storm/Ice Storm	Drinking Water Contamination
Flooding	Bioterrorism
High Winds (Thunderstorm, Tornado/Downburst/Hurricane)	
Earthquake	

B. PROFILING HAZARD EVENTS

Each of the hazards that the Committee identified as likely affecting Ashland is profiled below. This section of the plan describes each of the hazards which the Committee felt might impact Ashland. It describes the likely location of each hazard, the extent of the hazard, and the probability of an occurrence in Ashland. The extent is a description of "how bad the hazard could get" and the probability of occurrence is based upon a review of occurrences since the 2006 Plan as well as earlier events. A list of events prior to 2006 is included in Appendix E. For more information on these hazards, see Appendix G. The Committee defined Probability of Occurrence as High (usually occurs at least once every two years), Moderate (likely to occur at least once every ten years), and Low (there is usually at least ten years between each occurrence).

CONFLAGRATION

Location: Downtown business and residential districts, including several historic structures.

Extent: Conflagration is an extensive, destructive fire in a populated area that endangers lives and affects multiple buildings. There are more than 180 lots, most with structures, in Ashland's village area (approximately 100 acres) including residential, commercial, and industrial properties. Most of these structures are more than fifty years old.

Many New Hampshire towns, including Ashland were settled in areas along waterways in order to power the mills. Often the town centers were at a low point in the topography, resulting in dense

residential development on the steeper surrounding hillsides. Hillsides provide a natural updraft that makes fire fighting more difficult. In particular, structural fires spread more readily in hillside developments because burning buildings pre-heat the structures that are situated above them. While not particularly steep, Ashland's downtown does have some slope and the buildings are relatively close together. In the lower part of town is a large, abandoned mill complex.

History:
The 1903 Great Lakeport Fire (Laconia) is considered one of the most devastating structural fires to occur in the state of New Hampshire. It consumed more than 100 homes; two churches, two factories, a large mill, a power plant, and a fire station. Wolfeboro's history includes a significant fire in the winter of 1956. This event is recognized as the last block fire in town and is considered a small conflagration. On April 12, 2009 the Alton Bay Christian Conference Center complex caught fire, resulting in an 11-alarm fire and destroying more that 40 structures.

While there is no recent history of conflagration, the committee felt that conditions exist in Ashland to warrant a moderate level of concern. With the age, construction type, and proximity of the structures in the village area, a conflagration could occur at any time.

Probability of Occurrence: Moderate

LIGHTNING
Location: Lightning can strike anywhere in town.

Extent: 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, resulting in thunder.[6] Thunderstorms occur mainly in the summertime; some can be anticipated and detected well in advance while others are "pop-up" storms that are limited in size and duration. Exactly where and when lightning will strike is unknown. Most thunderstorms do not last long in any one location but move through fairly quickly. These giant sparks of electricity can result in fire or electrical damage to property or electrocution of people.

History: No structural damage or deaths due to lightning have been reported for Ashland recently; however, the potential for damage or injury exist within any of the many thunderstorms that pass overhead each year. .

Probability of Occurrence: High.

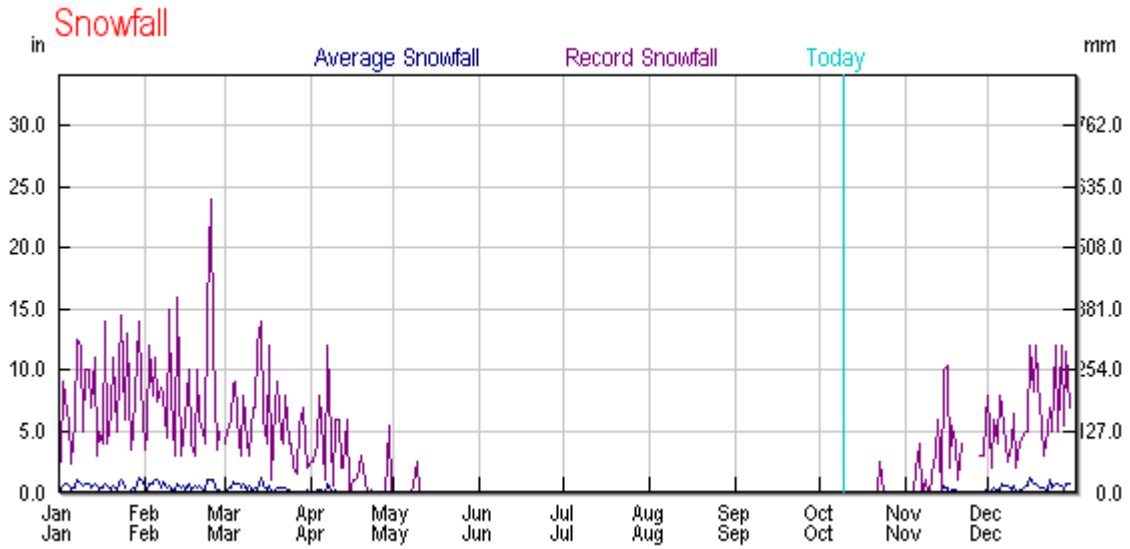
SEVERE WINTER WEATHER (SNOW STORMS, ICE STORMS)
Location: Snow and Ice Storms can affect the entire town. Severe winter weather occurs frequently in the northeast and the possibility exists for residents to have to withstand several days without power. No one area of the town and region is at greater risk than another, but there are segments of the population that are more at risk. These include the elderly, people that are in need of regular medical care, and young children. These weather events can vary greatly based on slight differences in

[6] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-3.pdf accessed September 16, 2013.

temperature, humidity, and elevation. Some events will produce a combination of winter weather types.

Extent:
A heavy snowstorm can be defined as one which deposits four or more inches of snow in a twelve hour period. The region typically receives greater than 66" of snow annually.[7] Records indicate that Ashland's average snowfall on any day from November through April is less than an inch. The record also shows that deposits of more than ten inches have happened in each of these months and in February the town has seen more than fifteen and even twenty inches of snow in one day.

Average and Record Snowfalls for Ashland, NH[8]



An ice storm coats trees, power lines, streets, vehicles, and roofs with a very slick and heavy coating of ice. In the winter of 1998, a major ice storm crippled much of New Hampshire, coating everything with as much as three inches of ice. The U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory estimates a 40 – 90 year return period for an event with a uniform ice thickness of between 0.75 and 1.25 inches. Ten years later (2008), however, New Hampshire was struck again by another severe ice storm.

New Hampshire generally experiences at least one or two nor'easters each year with varying degrees of severity. A nor'easter is defined as a large anticyclone weather system that resides near the New England region. These storms have the potential to inflict more damage than many hurricanes because high winds can last from twelve hours to three days, while the duration of hurricanes ranges from six to twelve hours. A nor'easter also has the potential to sustain hurricane force winds, produce torrential rain, and create blizzard conditions in winter months.

[7] *Northeast States Emergency Consortium,* http://www.nesec.org/, visited January 25, 2011.
[8] Weather Underground, Season Weather Averages http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KLCI&SafeCityName=Ashland&StateCode=NH&Units=none&IATA=LCI&MR=1.

In the winter months, the state may experience the additional coincidence of blizzard conditions with many of these events. A blizzard is characterized by sustained winds or frequent gusts to 35 miles per hour or greater and considerable amounts of falling or blowing snow that last for a duration of three hours or longer. The combination of winds and snow reduce visibility to less than a quarter mile.[9]

History:

Hazard	Date	Location	Remarks/Description	Source
Nor'easter	4/27/2007	Statewide	Nor'easter brought flooding and high winds with damages in excess of $25 million. Disaster Declaration DR-1695	FEMA
Ice Storm	12/11/2008	Statewide	State emergency declaration after major power and transportation disruption. Exceeding $15 million in damages. Over 400,000 without power, 2 fatalities due to carbon monoxide poisoning. Disaster Declaration DR-1812	NH HSEM
Nor'easters	Feb. 23 – March 3, 2010	Statewide	330,000 without power and $2 million in damages. Disaster Declaration DR-1892	FEMA
Ice Storm	3/6/2011	Statewide	$700,000 plus numerous power outages. Ice jams along the Pemigewasset River in Plymouth.	NOAA

Additionally, NOAA reported twenty-eight snow and ice storm events impacting southern Grafton County between 2007 and 2012; $384,000 in property damages were reported.

Probability of Occurrence: Snow storm – high, Ice storm - moderate

FLOODING

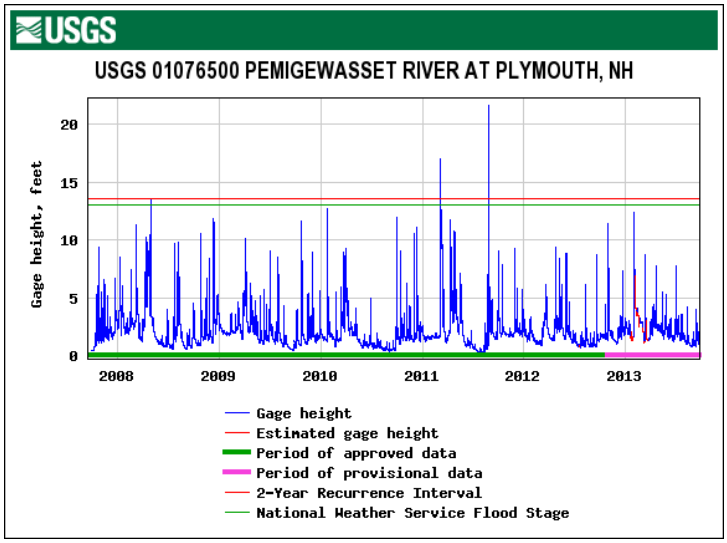
Location: There are a few road segments in Ashland that flood (Collins Street Bridge and Thompson Street). Grafton County Digital Flood Insurance Rate Maps (DFIRM) show the flood boundaries in the event of a 100-year flood, defined as a having a one percent chance of flooding each year. This identifies sections along the Squam River, Owl Brook, Ames Brook, (including some of the Village area) and large portion in the northwest corner of town along the Pemigewasset River. The hazards map indicates several downtown areas beyond the 1% floodplain where the committee indicated that riverine flooding has also occurred.

Extent: Flooding is defined as a temporary overflow of water onto lands that are not normally covered by water. It results from the overflow of rivers and tributaries or inadequate drainage. Flooding is most commonly associated with structures and properties located within the 1% annual floodplain. Stream gauges along the Pemigewasset and Squam Rivers can give an indication of the number of feet above flood stage at which each river is running[10].

The US Geological Survey (USGS) graph on the next page of the Pemigewasset River at the stream gauge just upstream in Plymouth indicates that the height of the river varies a great deal throughout

[9] "Winter storm terms," http://www.fema.gov/hazard/winter/wi_terms.shtm, visited February 8, 2011.
[10] Pemi in Plymouth http://waterdata.usgs.gov/nh/nwis/uv/?site_no=01076500&PARAmeter_cd=00065,00060,72020, Squam River in Ashland http://www.americanwhitewater.org/content/Gauge2/detail/id/30652/.

the year from less than three feet to over ten feet.[11] In several of the years since 2006 the river reached flood stage of more than 13 feet. Flooding from Tropical Storm Irene (2011) forced the closure of Exit 24 of I-93 for several days.[12] The actual depth of water at individual locations can vary. Owl Brook and Ames Brook can be quite flashy due to the topography, with water levels rising quickly. While there is not a gauge on any of these brooks, in the August 4, 2008 rain event Ames Brook rose high enough to wash an SUV 100 yards downstream.



Dams in New Hampshire are classified by the New Hampshire Department of Environmental Services Dams Bureau. The four dam hazard classifications (High, Significant, Low, and Non-Menace) are based on the potential losses associated with a dam failure (See Appendix H for detailed descriptions). High (H) and Significant (S) Hazard dams have the highest potential for damage; this could include damage to state or municipal roadways as well as structures. There are eight active dams in Ashland (Table 8); two High Hazard, one Significant Hazard, two Low (L) Hazard, and three Non-Menace (NM) Hazard dams; the two High Hazard dams are in the Village area. There are two High Hazard dams in the Village area and the Sewage Lagoon near the Pemigewasset is rated as a Significant Hazard dam. Details on the dams in Ashland and the classification system are provided in greater detail in Appendix G (Tables G-1 and G-2).

History:

Hazard	Date	Location	Remarks/Description	Source
Flood	7/24/2008-8/14/2008	Grafton Co.	Damages of over $3 million Declared Disaster DR-1787	NOAA
Flood	4/26-30/2011	Grafton Co.	Damages of $1.8 million Declared Disaster DR-4006	NOAA
Flood	8/28/2011	Grafton County	Tropical Storm Irene caused the Pemigewasset River to crest at 21.7 feet in Plymouth, 8.7 feet above flood stage. Declared Disaster DR-2046	NOAA
Flood	10/26 – 11/6/2012	Grafton County	Declared Disaster DR-4095	NOAA

The NOAA database reports a total of 35 flooding events in southern Grafton County, resulting in $9.2 million in property damages.

[11] US Geological Survey, Current Water Data for New Hampshire http://waterdata.usgs.gov/nh/nwis/rt.
[12] New Hampshire Union Leader, Irene Blog, August 29, 2011 http://newhampshire.com/article/20110829/NEWS11/110829899/0/newhampshire.

On August 4, 2008 rain events caused substantial flash flooding and washouts in Ashland, New Hampton, Center Harbor, and Meredith. In addition to property damages, one young girl died in Ashland as a result of this storm[13].

Probability of Occurrence: Moderate

HIGH WINDS (THUNDERSTORM/TORNADO/DOWNBURST/HURRICANE)

Location: On average, six tornadoes touch down somewhere in New England each year. There is no way of knowing where or when the next damaging tornado will strike as they are among the most unpredictable weather phenomena. Downbursts are 10 times more likely to occur than tornadoes. All areas of town are susceptible to damage from high winds.

Extent: Tornadoes are violent rotating storms that extend to the ground with winds that can reach 300 miles per hour. They are produced from thunderstorms and can uproot trees and buildings.

According to the National Oceanic and Atmospheric Administration (NOAA) a downburst is a strong downdraft, rotational in nature, which causes damaging winds on or near the ground. Winds can exceed 130 mph.[14] Downbursts fall into two categories based on their size:

- microbursts, which cover an area less than 2.5 miles in diameter, and
- macrobursts, which cover an area at least 2.5 miles in diameter.

History:

Hazard	Date	Location	Remarks/Description	Source
High Winds	4/16/2007	Plymouth	Winds > 50 knots Roof and two skylights blown off of Plymouth Regional High School ($40,000)	NOAA
Tornado	7/24/2008	Southern Lakes Region	F2 Tornado 50-mile path Uprooted and snapped trees, damaged structures. Declared disaster DR-1782	NOAA
Tornado	8/21/2011	Grafton, Orange	F1 Tornado 2.7 miles long, 350 yds wide Damaged hundreds of trees and several buildings	NOAA
Tornado	7/17/2012	Bridgewater	F0 Waterspout on Newfound Lake No damages	NOAA
Microburst	10/31/2012	Franklin	Winds > 50 knots Downed numerous trees, destroying one house and damaging several others	NH Union Leader[15]

[13] USAToday http://usatoday30.usatoday.com/news/nation/2008-08-08-596728286_x.htm.
[14] *Weather Glossary*. National Oceanic and Atmospheric Administration, http://www.weather.gov/glossary/index.php?letter=d, visited March 8, 2011.
[15] http://www.unionleader.com/article/20121031/NEWS11/121039788

NOAA reported thirty-four thunderstorm/high wind events impacting southern Grafton County between 2007 and 2012; one injury was reported but no substantial damages.

Probability of Occurrence: High

EARTHQUAKE

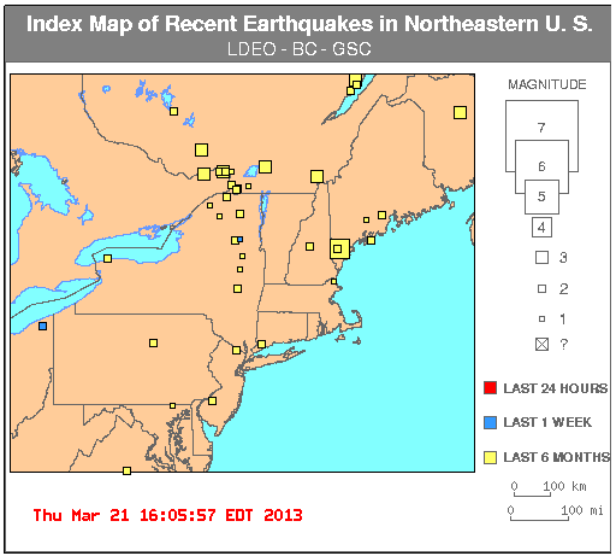
Location: An earthquake would affect all areas of Ashland. Due to the age and height of the buildings, the downtown area would likely sustain the most damage.

Extent: An earthquake is a series of vibrations induced in the Earth's crust by the abrupt rupture and rebound of rocks in which elastic strain has been slowly accumulating. Earthquakes are commonly measured using *magnitude*, or the amount of seismic energy released at the epicenter of the earthquake. The Richter magnitude scale is a mathematical device used to compare the size of earthquakes, shown in Table 7.[16]

Table 7: Richter Magnitude Scale

Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph.
2.5 to 5.4	Often felt, but only causes minor damage.
5.5 to 6.0	Slight damage to buildings and other structures.
6.1 to 6.9	May cause a lot of damage in very populated areas.
7.0 to 7.9	Major earthquake. Serious damage.
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.

New Hampshire is considered to be in an area of moderate seismic activity with respect to other regions of the country. This means the state could experience large (6.5-7.0 magnitude) earthquakes, but they are not likely to occur as frequently as in a high hazard area like the Pacific coast. There is the potential for nearby earthquakes to register 5.5 on the Richter Scale, causing slight damage to buildings and structures. Due to the unique geology of New Hampshire, earthquake propagation waves travel up to 40 times further than they do in the western United States, possibly enlarging the area of damage.[17] The strongest earthquakes to strike New Hampshire occurred December 20 and 24, 1940 in the town of Ossipee. Both earthquakes had a magnitude of 5.5 and were felt over an area of 400,000 square miles.



History: On average, every other year the Lakes Region experiences an earthquake, though these earthquakes are mild and go mostly undetected by people. Sanbornton (Gaza) and Tamworth are

[16] http://pubs.usgs.gov/gip/earthq4/severitygip.html, visited February 8, 2011.
[17] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html visited February 8, 2011.

identified as a major epicenters in the region.[18] A search of the USGS National Earthquake Information Center database shows that since 1977 there have been 13 earthquakes with a magnitude of at least 3.0 within a 100 km (62 mi.) radius of Ashland; the largest was magnitude 4.7.[19] Two such earthquakes have occurred since 2006; a 3.2 event in 2010 centered in Penacook, NH and a 4.0 quake centered in southern Maine shook the region on October 16, 2012. The image at right indicates earthquakes in the northeast during the past six months. [20]

Probability of Occurrence: Low (a slight to moderate [2.5 – 5.4] earthquake about every three years, a rather strong [5.5 – 6.0] event once in 30 years)

HAZARDOUS MATERIALS IN TRANSPORT

Location: Major roadways, especially in populated areas or near water bodies are areas of concern. The committee noted that US Route 3/NH Route 25 in the downtown area and along the Squam and Pemigewasset Rivers as areas of particular concern.

Extent: Oil spills along several of the routes in Ashland could result in the contamination of wells or waterbodies in the watershed. In addition to distributing fuel to central locations in the region, tankers travel throughout the area daily to deliver home heating fuel. Many oil tankers have the capacity to carry 10,000 gallons of home heating oil.

History: No local incidents were identified; however the volume of traffic and proximity to state roads to vulnerable water bodies led the Committee to consider a spill of hazardous materials while in transport a very likely event.

Probability of Occurrence: Moderate

EPIDEMIC/PANDEMIC

Location: An epidemic is an outbreak of a disease, generally isolated to one area. A pandemic is a widespread disease outbreak. The disease spreads easily person-to-person, can cause serious illness, and can sweep across the country and around the world in very short time.[21] An outbreak could impact anyone in town. Transmission of germs and diseases between people is accelerated in a close living and socializing environment. Schools, and congregate care centers for the elderly are good places for transmission to occur.

Extent: The New Hampshire Health and Human Services developed an epidemic and pandemic response plan in February 2007, so that communities can be prepared and respond to outbreaks.[22]

Over the past ten years, two strains of influenza viruses have become concerns across the country. The Lakes Region of New Hampshire has a large influx of seasonal visitors, which could make viral containment very difficult. Between 2005 and 2006, the Avian Influenza H5N1 virus infected 81 people and killed 52 in 10 countries in Asia and Africa**.** Most of the H5N1 cases were a result of

[18] http://des.nh.gov/organization/commissioner/pip/factsheets/geo/documents/geo-3.pdf , pg. 3, visited January 25, 2011.
[19] USGS. http://earthquake.usgs.gov/earthquakes/eqarchives/epic/, Accessed August 2, 2012
[20] Lamont-Doherty Cooperative Seismic Network http://www.ldeo.columbia.edu/LCSN/index.php, accessed March 27, 2013
[21] http://www.pandemicflu.gov/, visited February 8, 2011.
[22] http://www.dhhs.nh.gov/dphs/cdcs/avian/documents/pandemic-plan.pdf, visited February 8, 2011.

human contact with infected poultry and the spread of the virus has not continued beyond that person. Although no human-to-human cases have been reported, viruses have the ability to mutate. The significance of the H5N1 pandemic is that it brought local, state, and federal attention to the need for pandemic emergency preparedness plans.

In 2009, the WHO declared a global H1N1 pandemic.[23] H1N1 is an influenza virus that can spread "human to human" through respiratory droplets from coughs or sneezes.[24] Many of the planning systems developed out of the H5N1 pandemic were useful during this pandemic.[25]

History: While there certainly have been minor outbreaks of flu in Ashland, no major outbreaks of this or any other infectious disease was identified during this process. The 2012-13 flu season has been much more severe in New Hampshire than in the past several years.; 35 deaths have occurred statewide, the most since 1997.[26]

Probability of Occurrence: Moderate. Epidemics do occur in Ashland and other Lakes Region communities from time to time.

DRINKING WATER CONTAMINATION
Location: Town water system – wells, pipes, pumping stations

Extent: Contamination of the drinking water supply or infrastructure could cause sickness or death. NH Department of Environmental Services has identified more than a dozen potential sources of contamination for community water sources throughout the state.[27]

History: While no incidents of drinking water contamination have been reported, the committee felt that the location and exposure of the town wells and infrastructure make this quite vulnerable to accidental or intentional disruption.

Probability of Occurrence: Moderate

BIOTERRORISM
Location: Ashland Elementary School is a potential target for bioterrorism.

Extent: Bioterrorism is the use or threat to use chemical, biological, radiological, nuclear, or explosive devices as weapons. Events of this nature could be large or small.

History: Although no local incidences of bioterrorism have been reported in Ashland, the Committee felt that the Elementary School was particularly vulnerable to such activity.

Probability of Occurrence: Low

[23] http://c3ph.org/Files/vaccine_fact.pdf, visited February 15, 2011.
[24] http://c3ph.org/Files/H1N1FAQ.pdf, visited February 15, 2011.
[25] http://www.cdc.gov/h1n1flu/cdcresponse.htm, visited February 8, 2011.
[26] NH Department of Health and Human Services http://www.dhhs.nh.gov/media/pr/2013/01-jan/01112013flu.htm, visited January 17, 2013.
[27] http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-12-6.pdf, accessed January 18, 2013 and http://www.dhhs.nh.gov/media/pr/2013/01-jan/01292013flu.htm accessed January 29, 2013.

Summary

High winds, snowstorms, and lightning are the most commonly occurring hazard events in Ashland.

It is cost prohibitive to make the built environment resistant to the most devastating natural hazards that could occur, though reasonable measures can be taken to minimize loss of life and property damage. Ashland may be affected by an unavoidable extraordinary circumstance such as a violent earthquake, but historically, events of this magnitude have been infrequent. Those natural events that are common to the northeast also have common elements of concern for public safety. These include the potential for long-term power outages, the potential need for short-term sheltering facilities, and the availability of equipment and trained personnel. Key to loss prevention in these relatively common event scenarios is pre-event planning that critically assesses communications within the community, mutual aid resources regionally, public awareness and education, and emergency response training.

CHAPTER IV: VULNERABILITY ASSESSMENT

A. INVENTORY ASSETS

The list of critical infrastructure for the town of Ashland was updated by the Committee and the values updated by the Town Assessor (Table 9). The critical infrastructure list is divided into three categories, 1) Essential Services; 2) Populations to Protect, and 3) Structures and Services. The first category contains facilities and services essential in a hazard event. The second contains populations that the Committee wished to protect in the event of a disaster The third category includes structures that have been identified by the Committee as facilities to protect in order to minimize additional risk to hazards (dams). The 2011 assessment values for each of these structures (not including contents) are included.

Table 9: Critical Facilities

CLASSIFICATION	TYPE	NAME	ADDRESS	VALUE
Essential Services	Town Hall	Ashland Town Hall (houses Town Offices & Police)	20 Highland Street	$395,900
Essential Services	School / Emergency Shelter	Ashland Elementary School	16 Education Drive	$4,233,600
Essential Services	Fire station/ Emergency Operations Center	Ashland Fire Station	9 Main Street	$577,200
Essential Services	Utility	Ashland Well Head	Cedar Lane	$25,500
Essential Services	Utility	Ashland Water Tower	Harold Avery Street	$666,400
Essential Services	Utility	Ashland Waste Water Treatment Facility	137 Collins Street	$8,755,200
Essential Services	Utility	Pumping Station	Riverside Drive	$127,000
Essential Services	Utility	Pumping Station	(148) River Street	$123,000
Essential Services	Utility	Pumping Station	242 River Street	$123,000
Essential Services	Electric Dept	Ashland Electric Department	6 Collins Street	$428,800 together
Essential Services	Highway Dept	Ashland Highway Department	Depot Street	
Essential Services	Cell Tower	Verizon Wireless	Collins Street	$235,600
Essential Services	Repeater	Radio Repeater	Off Peppercorn	$6,000
Populations to Protect	Elderly Housing	Highland Apartments	White Mountain Court	$932,500
Populations to Protect	Elderly Housing	Common Man Commons (40 Units)	46 West Street	$1,697,100
Structures & Service	Dam	Squam Lake Dam		
Structures & Service	Dam	Squam River Hydro	Lanes	
Structures & Service	Dam	Squam River Power	Packard Mills	
Structures & Service	Dam	French River Basin	Mill Dana Lane	
Structures & Service	Dam	Jackson Pond Dam	Jackson Pond	

The *Potential Hazards and Critical Facilities Map* (Appendix F) identifies the location of the critical facilities in relation to mapped hazard areas.

B. IMPACT OF HAZARDS

The impact of a hazard is the potential degree of damage that could occur in Ashland. This incorporates the assessed value of each critical facility and the vulnerability of these facilities and various populations and places to protect. To rate the impact of a hazard, committee members considered the damages and consequences that might result from an event, as defined below:

- Low: limited structural damage, the town's ability to respond is not compromised, local residents can handle the hazard event without help from outside sources
- Moderate: some structural damage, the town's ability to respond is compromised, regional or county assistance is needed to survive and/or recover
- Severe: substantial structural damage, the town's ability to respond is greatly compromised, state or federal assistance is necessary to survive and/or recover

Conflagration

A conflagration results in numerous homes or businesses suffering from fire damage, many completely lost. This sort of a blaze engulfs multiple structures, moving quickly from one to another. These swift-moving events also endanger many residents and workers.

Conflagration at the Alton Bay Christian Conference Center, 2009

Not all of Ashland's critical facilities are in this downtown area but some are (Ashland Town Hall & Police Station, Ashland Fire Department, and Ashland Elementary School). The impact to the whole town is viewed as severe.

Hazardous Materials in Transport

The release of hazardous materials along one of the roadways in Ashland has the capacity to cause substantial damage in the town; there are many variables that could affect the degree of impact. Variables include the nature of the material, the location of the accident and its proximity to surface and groundwater, as well as structures. An oil spill along a remote section of NH Route 175 is quite different from a chemical spill along US Route 3/NH Route 25 in the center of town near numerous businesses and residences. Impact to the town would likely be severe.

Epidemic

The concerns associated with an epidemic include the Ashland Elementary School and local capacity to respond to the needs of residents. The community does partner with the Public Health Network of Central New Hampshire for resources and training. The impact of an epidemic on the town would be moderate.

Drinking Water Contamination

Contamination of the municipal water system could impact 500 businesses and households in the downtown area. Not only could this impact the health of residents but also visitors and the local capacity to respond. This could also impact local businesses. The potential for impact to the town is severe.

Lightning

All thunderstorms contain lightning, which can cause death, injury, and property damage and have great potential to cause structure and wildfires. New Hampshire ranks 16th among the fifty states in terms of the rate of casualties resulting from lightning strikes each year.[28] Although the numbers have trended downward in recent decades, during the last half of the twentieth century more people were killed in the United States each year by lightning than by any other weather event. It can also wreak havoc with electrical and communications systems.

Power outages, whether associated with natural or man-made hazards have the potential to cause great disruption to residents and the functioning of the town. There is back-up power for most municipal facilities. The elderly and disabled who rely on powered medical devices are at risk. With more and more of the communication, coordination, and security functions of the town's departments and facilities relying on electronic systems, there is a high potential for lightning to have a direct impact on the town's critical facilities, especially the Town Hall. The potential for impact to the town is moderate.

Winter Weather (Snow Storms/Ice Storms)

Heavy snows can cause damage to property, disrupt services, and make for unsafe travel, even for emergency responders. Due to poor road conditions, residents may be stranded for several days. Extra pressure is placed on road crews and emergency services under these conditions.

The major threats to a community due to ice storms include structural damage due to heavy loads on roofs, interruptions of services such as electricity, fuel, water, and communications, as well as hazardous road conditions. It is not uncommon in New Hampshire to experience mixes of winter precipitation as temperatures fluctuate above and below the freezing mark. While not widespread, instances of collapsed roofs are not uncommon.

Downed limbs and wires and unplowed or untreated roads can severely limit emergency access to many residences. The potential for very cold temperatures and loss of power can quickly compound the issue.

The 1998 ice storm was the most costly FEMA/Presidential Declared disaster in New Hampshire's history. The ice load bent trees and power lines and led to massive power outages throughout the state. The December 2008 ice storm caused even more damage. The President declared this storm as a major disaster and the state received $15 million in federal aid for recovery.[29]

Major roads, Populations to Protect, Emergency Response Facilities, Essential Services, and flat-roofed buildings are all susceptible to damage from one of these storms. While the town is accustomed to periodic heavy snowfall, any particularly severe event with significant accumulations, especially combined with severe cold can be a burden. These events often lead to ice accumulation, and power loss, significantly increasing the vulnerability of populations and facilities. The potential for impact to the town is moderate.

[28] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html, accessed November 28, 2012
[29] http://www.fema.gov/news/newsrelease.fema?id=48384, visited January 25, 2011

Flooding
The town of Ashland actively participates in the National Flood Insurance Program through the administration of its floodplain ordinance. By actively maintaining an up-to-date floodplain ordinance property owners are able to purchase flood insurance through the FEMA program.

The Digital Flood Insurance Rate Maps (DFIRM) for Grafton County were released in 2008. The town's Floodplain Ordinance was revised to reflect the new boundaries. The Code Enforcement Officer is responsible for maintaining floodproofing and elevation certificates. The floodplains in Ashland follow the two rivers (Pemigewasset and Squam) as well as Owl and Ames Brooks. A Flood Insurance Study was conducted for Ashland by FEMA in 2008[30].

The only critical facility that is flood-prone is the Ashland Sewage Treatment Plant located at the confluence of the Pemigewasset and Squam Rivers. The primary impacts of flooding events would be on residential and some commercial properties. Additional damage may be incurred on Thompson Street and at the Collins Street Bridge.

Potential impact to the town due to flooding/erosion/washout is moderate.

High Winds (Thunderstorm/Tornado, Downburst, Hurricane)
Tornados and downbursts could strike anywhere in town with little, if any warning. While individual events may be small and rare, their impacts could be devastating. All structures, especially older ones, which are not necessarily built to the current building code standards, could be at risk.


Tuftonboro - September, 2011

Damage can occur to most structures in town as a result of downed trees in any high wind event, including the commonly occurring thunderstorms. These winds can bring down limbs and trees, causing damage to structures as well as pulling down power and telephone lines and blocking roads. Downed limbs and trees can make roads impassable and bring down power and telephone wires. In Ashland, the major damage from downbursts or tornados comes from falling trees, which may take down power lines, block roads, or damage structures and vehicles. The potential for impact to the town is moderate.

Bioterrorism
It is not likely that a bioterrorism event would result in much damage to structures. The primary impact would be to residents and possibly visitors. The ability of emergency response personnel to respond might be impacted. The Ashland Elementary School was considered particularly vulnerable.

Earthquake
Damage from an earthquake generally falls into two types; Structural and Nonstructural.

- Structural Damage is considered any damage to the load bearing components of a building or other structure.

[30] J. Gilbert, NH Floodplain Management Coordinator, April 11, 2013.

- Nonstructural Damage is considered any portion not connected to the superstructure. This includes anything added after the frame is complete.

According to the NH Division of Homeland Security and Emergency Management, some of the issues likely to be encountered after a damaging earthquake could be:

- Total or partial collapse of buildings, especially un-reinforced masonry structures and those not built to seismic codes.
- Damage to roads and bridges from ground settlement and structural damage.
- Mass Causalities.
- Loss of electric power.
- Loss of telecommunication systems.
- Fires from gas line ruptures and chimney failures.
- Total or partial loss of potable and fire fighting water systems from pipe ruptures.
- Hazardous Material incidences.
- Loss of critical capabilities from structural and nonstructural damages.
- Lack of mutual aid support.

The NH HSEM also notes that a "cascade of disasters" typically occurs after a damaging earthquake. For example:

- Damage to gas lines and chimneys result in fires that are difficult to extinguish due to damage to the road, water systems, fire and police stations.
- Structural and Nonstructural damage cause many injuries, but because of damage to health care facilities and emergency response facilities, there is a slow or nonexistent response.
- Responders are slowed in their response because of Hazardous Material incidents.
- Flooding due to dam failures.

According to the US Geologic Survey, the overall earthquake risk to the state is high due to the built environment; which means that many structures in the state are old or not built to withstand an earthquake. Damage from the 1940 earthquakes in Ossipee included some damage to most of the chimneys in the epicenter region of Ossipee, ranging from cosmetic cracks to total collapse. Sections of several foundations collapsed and at least one house rotated on its foundation. In the town of Conway, 15 miles from the epicenter, one house was lost to fire when sparks in a cracked chimney started the blaze. Splits found in the rafters and trusses temporarily closed Ossipee High School. No damages were associated with the October 2012 earthquake but the potential does exist for some damages to occur.[31]

There are numerous three stories buildings in Ashland, especially in the village area. Minor to slight damage could occur. A relatively large earthquake in all likelihood would impact the bridges, limiting the ability of emergency services to be rendered. The fire department would have some response problems if the bridges were impacted, although in most cases there are alternate options, requiring redeployment of apparatus and people.

The likely impact of an earthquake on the town would be high.

[31] USGS http://earthquake.usgs.gov/earthquakes/eventpage/usb000d75b#pager, accessed October 17, 2012.

C. ESTIMATING POTENTIAL LOSSES

The 2011 assessed value of the critical facilities identified in Table 9 totals $18,326,800. This does not; however, include the contents of the building and does not necessarily reflect the cost of full replacement. Also not reflected in this assessment is the value of built infrastructure such as streets, bridges, curbs, sidewalks, drainage, and utility transmission lines. These values can also be used to determine potential loss estimates in the event that a natural or manmade hazard damages a part of or an entire facility. Some of the facilities listed here are privately owned but represent service that the Committee considered to be essential in terms of mitigating vulnerability to hazards.

The value of all of the structures in Ashland is $192,718,700 and there is a total of 1,540 structures in town, resulting in an overall average value of $125,142. The value of the 1,376 residential structures in town totals $142,583,300. The value of the 96 commercial and industrial structures (including utilities) in Ashland is $26,305,400 and the value of the 68 tax-exempt structures (including structures such as the Fire Station and Town Hall) is $23,830,000. Using these figures and acknowledging that there is wide variation between the value of individual structures throughout town, the average value of residential structures in Ashland is $103,621, of commercial/industrial buildings is $274,015, and of exempt buildings is $350,441.

Conflagration
Due to the relatively close proximity and nature of construction of buildings in the village area, a fire here could become a conflagration, spreading quickly from one building to another. There are approximately 184 lots with structures in the village area, with a mix of residential, commercial/industrial, and tax-exempt properties. With an average value of $125,142, this indicates that there is $23,026,128 worth of structures at risk to conflagration. Assuming a 1% chance of conflagration, each year conflagration could result in $230,261 in damages due to conflagration.

Hazardous Materials in Transport
A hazardous materials accident would not likely impact structures; rather the impact would be environmental. A 2007 report from NH Department of Environmental Services found that a reduction in water quality could lead to $25 million of lost income to the Lakes Region (30 communities).[32]

Epidemic
An epidemic would not impact structures; rather the impact would be on people and the public safety system.

Drinking Water Contamination
Five hundred commercial and residential units are served by the Ashland Water and Sewer Department. The health of residents, workers, and patrons could be compromised. Damage to structures and infrastructure would be minimal.

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Lightning All structures in Ashland are susceptible to damage by lightning and resulting fires. The town's computer and communication systems could also be impacted by lightning. Assuming 1% town-wide damage to buildings, each year lightning could result in $1,927,187 in damages.

[32] http://des.nh.gov/organization///commissioner/pip/publications/wd/documents/whats_our_water_worth.pdf.

Winter Weather
All structures in Ashland are susceptible to damage by winter weather events, whether through ice storms, blizzards, or the heavy, wet snow often associated with a nor'easter. Assuming 1% to 5% town-wide damage to buildings, winter weather could result in $1,927,187 to $9,635,935 in damages annually.

Flood
In 2009 the town of Ashland reported to FEMA that there were an estimated 71 structures in the Flood Hazard Area housing 170 people.

There are twenty-one structures in Ashland that carry flood insurance; seventeen are residential properties. Four non-residential properties are covered by flood insurance (representing $140,400 in insured value). Sixteen of the insured properties are in the A-Zone (1% chance of an annual flood), the remaining properties are in the B, C, and X Zones (less than 1% chance of an annual flood - Moderate to Low Risk Areas).[33]). Thus only 23% of the structures estimated to be in the floodplain carry flood insurance.

The insured value of the twenty-one structures with National Flood Insurance Program (NFIP) policies is $2,760,500, yielding in an average insured value of $131,452. With 71 structures in the flood hazard area and with an average value of $103,621 for a residential structure in Ashland, there is the likelihood that $7,357,091 in structural value is at risk due to flooding, leaving an estimated $4,596,591 worth of structural value uninsured.

Since 1986 there have been three losses paid out for a total of $34,295; all on residential properties, all in the B, C, or X Zones. Two of these losses occurred on one structure; this is referred to as a "repetitive loss"; at this point in time, no mitigation has occurred regarding this structure.[34]

Approximately 170 people could be at risk due to flooding. If there is a 1% chance of each of these properties flooding each year, then there is the potential that flooding could result in $73,571 in damages and put 2 people at risk each year.

High Winds
All structures in Ashland are susceptible to damage by high wind events, whether through thunderstorms, downburst, tornado, or hurricane. Assuming 1% to 5% town-wide damage to buildings, high winds could result in $1,927,187 to $9,635,935 in damages.

Bioterrorism
An act of bioterrorism would not directly impact structures; rather the impact would be on people and the public safety system. Some structures or infrastructure might be contaminated depending upon the nature of the event.

Earthquake– emphasis on downtown
All structures in Ashland are susceptible to damage by an earthquake Assuming 1% town-wide damage to buildings, an earthquake could result in $1,927,187 in damages any given year.

[33] FEMA definitions,https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%20Flood%20Zone%20Designations.
[34] NFIP State Coordinator, NH Office of Energy and Planning, January, 2013.

D. SUMMARY OF RISK

A matrix was created to determine an overall hazard risk assessment rating. Each criterion (probability of occurrence and impact) was given a rating to show which hazards are the greatest threat to the community, based on: historic events and local knowledge, danger/destruction, the town's ability to respond, and economic, and environmental issues. These ratings were transformed into numerical values 3, 2, and 1, with 3 as high and 1 as low.

The overall risk rating associated with each hazard was determined by multiplying the two factors. This resulted in risk ratings ranging from 1 to 9; 1, 2 = low risk, 3, 4 = moderate risk, 6, 9 = high risk. This Plan will focus on those events that pose at least a moderate risk to the town of Ashland as determined by the Committee (Table 10).

Table 10: Risk Assessment

Ashland	Risk Assessment												
	Geographic Area					Specific Areas of Concern	Probability of Occurrence			Vulnerability			Risk Rating
Hazard Type	Localized	Town-wide	Regional	State-wide	Other (explain)	Describe potential impact areas (critical facilities, floodplain, etc)	High	Moderate	Low	High	Moderate	Low	Probability * Vulnerability
Flood, Drought, Extreme Heat & Wildfire													
Flood (precipitation/snowmelt)	✓					Floodplain		2			2		**4**
Dam Failure (flooding)	✓								1		2		**2**
Drought				✓					1			1	**1**
Conflagration	✓					Village structures		2		3			**6**
Extreme Heat				✓				2				1	**2**
Wildfire			✓						1		2		**2**
Geologic Hazards													
Earthquake			✓			Structures in the village			1	3			**3**
Severe Wind Hazards													
Thunder Storm/Lightning			✓			Any structure in town	3				2		**6**
Hurricane			✓			Wind – entire town, Flooding - floodplain			1		2		**2**
Tornado/Downburst	✓					Could strike anywhere		2		3			**6**
Hail			✓						1		2		**2**
Winter Weather Hazards													
Blizzard/Snow Storm			✓			Roadways, structures with low pitched roofs	3				2		**6**
Ice Storm			✓			Higher elevations, power lines, roadways		2			2		**4**
Cold Snap				✓				2				1	**2**
Human-Related Events													
MV Accident involving Hazardous Materials	✓							2		3			**6**
Epidemic					✓	Ashland Elementary School		2		3			**6**
Other													
Drinking Water Contamination	✓					500 units on Ashland Water and Sewer, including Town Hall and school		2		3			**6**
Bioterrorism			✓			Ashland Elementary School			1	3			**3**
Town-wide Power Loss		✓				All areas. This is a secondary hazard, resulting from some other event.			1	3			**3**

It should be noted that the ranking of individual hazards for the purposes of planning discussion should not in any way diminish the potential severity of the impacts of a given hazard event. Further, hazards ranked as low risk may have the impact of increasing the risk of other hazards when they occur. For example, in the event of a drought, the risk of woodland fire may be greater. In combination, hazard events may have the impact of overwhelming existing emergency response systems.

CHAPTER V: MITIGATION STRATEGIES

A. CURRENT PLANS, POLICIES, AND REGULATIONS

The planning decisions that affect community growth patterns have evolved over the years as the population and demographics in Ashland have grown and changed. Many local programs have the effect of mitigating disasters; some of these have been in effect for years, others have been implemented as a result of the 2006 Hazard Mitigation Plan. A review of existing mitigation strategies was conducted and included review of pertinent documents including the zoning ordinance, subdivision regulations, site plan regulations, and discussion with Committee members. The following strategies detail existing plans and regulations related to hazard mitigation.

Table 11: Existing Protections and Policies

Existing Protection	Description	Area Covered	Responsible Party
Zoning Ordinance	Floodplain Development limitations	Town	Planning Board
	Participate in NFIP (emergency entry June 1975, regular entry April 1986)		
	FIRM maps are developed		
	River and lakefront overlay districts to reduce pollution and erosion		
	Soils-based lot sizing		
	Have some regulation of development on steep slopes		
Subdivision Regulations	Have floodplan development regulations	Town	Planning Board
	Fire Department review of Subdivision applications		
	Have some erosion control requirements		
Sewer/Water Service	Ashland Water & Sewer Department	Village District (about 500 homes & businesses)	Ashland Water & Sewer, Selectmen
Fire Department	Participate in Lakes Region Mutual Aid.	Town/Region	Fire Chief
	The F.D. reviews site plans and performs final inspections for oil burners, wood stoves, and fireplaces.		
	Conducts capacity evaluations, wood stoves & oil burners		
Dry Hydrants	Do have a system of dry hydrants	Town	Fire Chief
Police Department	Full-time PD Chief	Town	Police Chief
Highway Department	Full-time Public Works Director	Town	Public Works Director
Emergency Operations Plan	Updated in 2010.	Town	Emergency Management Director
Building Codes and Inspector	Inspects state and local projects	Town	Code Enforcement Officer
	Adopted state building codes		
Power	Back-up power at: Ashland Fire Station. Do have portable generator for the Ashland Elementary School.		N/A
	Scheduled tree-trimming protects the power lines		
	The downtown power lines are of a higher grade to prevent breakage		

Existing Protection	Description	Area Covered	Responsible Party
	Residents on oxygen are registered with the electric department which gives them priority for reconnecting lost power:		
Shelters	Ashland Elementary School (primary) - Red Cross certified	Town	Emergency Management Director
	Plymouth State University (secondary)		
	Have developed a Pet Shelter policy		
Dams	Inspected regularly by NH Department of Environmental Services		
Emergency Operations Center (EOC)	Fire Station serves as the EOC.		
Communications	Have instituted a Code Red system for communicating with members of the public.		

Table 12: Changes in Protections since 2006

Protection Type	Description
Planning	Updated Building Code to the International Building Code, including seismic protection (2012). Updated Floodplain Ordinance.
Infrastructure	River Street Bridge improvement was completed. Collins Street Bridge was rebuilt in 2012 (but this did not address flooding issues)
Shelter	Ashland Elementary School is a Red Cross certified shelter
	There is a pet shelter plan in place
Communication	Now have Code Red system through Grafton County
	There is a MACE Center for public health emergencies at the Ashland Fire Station.
Emergency Event	There are half a dozen local vendors who can supply emergency fuel.
Coordination/Communication	The Ashland Fire Station is the Emergency Operations Center.
	EOP updated in 2010
	All pumping stations now have unique 911 addresses.
Emergency Event	There are back-up generators at the Ashland Fire Station and Ashland Elementary School (portable).
Infrastructure	There is now a regular road maintenance plan.
	All pumping stations now have a unique 911 address.
Fire Education & Outreach	Home fire prevention information is distributed through the Ashland Elementary School.
Flood Education & Outreach	Home owners that are within the flood inundation pathway are notified. Digital FIRMs became available in 2008. A Community Assistance Contact was conducted in 9/2008.
Epidemic	The town actively participates in the Central NH Public Health Network

B. STATUS OF 2006 ACTIONS

The committee noted that most of the mitigation strategies from the 2006 Hazard Mitigation Plan have either been completed or are no longer applicable due to changes in local circumstances. The status of the mitigation actions recommended in the 2006 plan is indicated in Table 13 as either, Completed, Deleted, or Deferred. Some of the deleted Actions are now listed above as "Current Plans, Policies, and Regulations". Deferred Actions (or deferred portions of Actions) were carried forward to be considered as new Mitigation Actions (Table 14).

Table 13: Status of Mitigation Actions from the 2006 Hazard Mitigation Plan

ID	MITIGATION ACTION	Status	Comment
a	Set up a communications center in the fire station and provide space for all departments	Completed	---
b	Communicate with the identified secondary shelters for their cooperation	Completed	Plymouth State University
c	Maintain road maintenance for safe driving.	Delete	This is now a policy, see Table 13.
d	Distribute information on how to protect homes from fires	Delete	This is now a policy in conjunction with the school, see Table 13.
e	Inform residents that are within the inundation pathway	Delete	This is now a policy, see Table 13.
f	Survey trucks with hazardous material placards driving on I-93	Delete	This is no longer viewed as a task that is useful for mitigating the hazard.
g	Send fire prevention info home with kids through the electric department workshops	Delete	This is now a policy, see Table 13.
h	Include information on what to do during an earthquake in the town report	Delete	This is no longer viewed as an appropriate method for addressing the need.
i	Contact the Freudenberg Plant for staffing the volunteers of the fire department	Delete	This is no longer viewed as an appropriate method for addressing the need.
j	Contact local Women's clubs for staffing/location volunteers of the fire department	Delete	This is no longer viewed as an appropriate method for addressing the need.
k	Contact the Rochester Shoe Tree for staffing the volunteers of the fire department	Delete	This is no longer viewed as an appropriate method for addressing the need.
l	Assess all dams and dismantle those which are not of high use	Delete	This is now a policy, see Table 13.
m	Add more sandbags to town supply for flooding	Defer	Insufficient funding
n	Provide information on what to do in the event of a power outage	Defer	This will be incorporated into an All-Hazards outreach effort.
o	Include the Hazard Mitigation Plan information in the town report	Defer	This will be incorporated into an All-Hazards outreach effort.
p	Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2.	Defer	The master Plan is undergoing an update and is due to be adopted in late 2013.

ID	MITIGATION ACTION	Status	Comment
q	Distribute earthquake emergency information to local residents through electric bill	Defer	This will be incorporated into an All-Hazards outreach effort.
r	Incorporate impervious surface regulations in local ordinances as outlined in RSA 675:6	Defer	Political will.

C. MITIGATION GOALS AND TYPES OF ACTIONS

The State of New Hampshire Natural Hazard Mitigation Plan is prepared and maintained by the New Hampshire Homeland Security and Emergency Management (NH HSEM). The 2010 version of the plan sets forth seven overall hazard mitigation goals for the State of New Hampshire[35]:

No particular goals were identified in the 2006 Ashland Hazard Mitigation Plan, mitigation actions were simply divided into short- and long-term actions.

The current committee utilized the four major goals commonly used in local hazard mitigation plans described below (Goals I – IV). These were then made more specific as problem statements were developed on which the recommended mitigation actions are based (Table 15).

Goal I: Community and Resource Protection
Reduce the potential impact of natural and manmade disasters on the town's residents and visitors, as well as its critical facilities, property, economy, and natural resources, while improving the emergency communication, alert, and response systems.

Goal II: Outreach and Education
Improve public awareness of the impacts of potential hazards and hazard preparedness, while increasing the public's involvement in emergency response and recovery.

Goal III: Coordination and Communication
Ensure plans are in place to address various emergency situations and that regular communication occurs between various departments and with local, regional, and state officials; thereby ensuring that those involved are aware of their responsibilities.

Goal IV: Damage Prevention
Minimize the damage and public expense which might be caused to public and private buildings and infrastructure due to natural and manmade hazards.

There are a number of types of actions that communities may take to reduce the likelihood that a hazard might impact the community. These include:

[35] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-7.pdf, pages VII-1&2, accessed July 25, 2012.

1. **Actions that will keep things from getting worse - Prevention**
    a. Zoning – floodplain and steep slope overlays
    b. Open space preservation
    c. Subdivision and Site Plan Review
        i. Impervious surface limits
        ii. Stormwater management
    d. Capital Improvements Plan – limiting the extension of public infrastructure into hazard areas
    e. Building and Fire codes

2. **Actions that address individual buildings - Property Protection**
    a. Flood-proofing existing buildings
    b. Retrofitting existing buildings to reduce damage
    c. Relocating structures from hazard-prone areas
    d. Public procurement and management of land vulnerable to hazard damage

3. **Actions that will inform the public - Public education and awareness**
    a. Make hazard information and maps available to residents and visitors.
        i. Paper or electronic
        ii. Targeted at residents and businesses in hazard-prone areas
        iii. Set up displays in public areas, or homeowners associations.
        iv. Give educational programs in schools.
        v. Make information available through newspapers, radio, TV.
    b. Ask businesses to provide hazard information to employees.
    c. Adopt a real estate disclosure requirement so that potential owners are informed of risks prior to purchase.

4. **Actions that will protect natural resources**
    a. Erosion and sediment control programs
    b. Wetlands protection programs
    c. Expand public open space
    d. Environmental restoration programs

5. **Actions that will protect emergency services before, during, and immediately after an event (long-term continuity)**
    a. Protect warning system capability
    b. Protection or hardening of critical facilities such as fire stations or hospitals
    c. Protection of infrastructure, such as roads that are needed in emergency response

6. **Actions that will control the hazard – Structural projects**
    a. Diversion of stormwater away from developed areas
    b. Reservoirs to store drinking water

D. POTENTIAL ACTIONS

Through a review of the risk assessment and local vulnerabilities, a number of Problem Statements were identified and refined by the Ashland Hazard Mitigation Committee. Multiple brainstorming sessions yielded an updated list of mitigation strategies to address these current problems. Table 14 lists the problems and actions sorted out by the hazard(s) that they address and notes whether the action addresses existing structures/infrastructure or future (new) structures/infrastructure as well as which overall goal(s) they address and the type of mitigation action each represents.

Overall Goal Key: CRP – Community and Resources Protection OE – Outreach & Education
CC – Coordination & Communication DP – Damage Prevention

Table 14: Mitigation Actions by Hazard Type – Structure, Goal, Type

Hazard	Problem	Recommended Action	New/Existing Structures	Goal	Type
All	There are a number of hazards that could impact any building in Ashland at any time. Residents should be aware of how to protect their property and themselves.	Purchase and distribute an emergency preparedness guide for all hazards.	n/a	OE	Public Education & Awareness
All	All residents should be more aware of the HMP.	Further educate the public regarding the Hazard Mitigation Plan through town communications such as the website and town bulletin.	n/a	OE	Public Education & Awareness
All	The HMP can be better utilized as a planning tool by the Planning Board, Budget Committee, and Selectmen.	Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2	n/a	CC	Public Education & Awareness
All	The four existing CERT members are heavily burdened	Expand the local CERT team	n/a	OE	n/a

Hazard	Problem	Recommended Action	New/Existing Structures	Goal	Type
All	Residents and visitors should be aware of how to protect their property and themselves.	Provide education on all hazards via the town website	E	OE	Public Education & Awareness
All	The town needs better communications interoperability.	Upgrade Highway, Electric, and Water/Sewer departments to narrow band radios	n/a	CRP	Long-term Continuity
All	All residents should be more aware of the HMP.	Include Hazard Mitigation Plan information in the Town Report	n/a	OE	Public Education & Awareness
All	Need a backup shelter	Establish secondary shelter arrangements at the American Legion building	n/a	CRP	n/a
All	If power is lost at the Police Station/Town Office, the continuity of government and emergency response is jeopardized.	Install backup power at the police station/town office	E	CRP	Long-term Continuity
All	Without a repeater, communications signals can be weak in certain areas of town. If power goes out, the Peppercorn Road repeater will fail.	Install generator at repeater on Peppercorn Road	E	CRP	Long-term Continuity
All	If power is lost at the Town Garage, the continuity of emergency response is jeopardized.	Install generator at Town Garage.	E	CRP	Long-term Continuity

Hazard	Problem	Recommended Action	New/Existing Structures	Goal	Type
Flooding	The Squam River overflows its banks flooding downtown	Add more regular sized sandbags to the town's supply for flooding	E	DP	Property Protection
Flooding	It is difficult to readily locate the various Dam Emergency Action Plans for Ashland.	Coordinate the storage and availability of Dam Emergency Action Plan files together so they can be accessed at the EOC.	E	CC	n/a
Flooding	Along the Squam River there is not a threshold for flood elevations, which is important for insurance and evacuation purposes.	Determine the base flood elevation on the Squam River	E	CC	Public Education & Awareness
Flooding	There is concern regarding flooding and spillage at the Sewer Lagoon.	Update and coordinate with the Sewer Commission regarding flood exposure at sewer lagoons from flooding and spillage on the Squam and Pemigewasset Rivers.	E	CRP	Property Protection
Flooding	The Collins Street bridge floods each spring making it impassable.	Address flooding concerns on the Collins Street Bridge to mitigate flood hazard	E	CRP	Property Protection
Flooding	Drainage along Thompson Street is poor.	Address Thompson Street drainage through ditching, catch basins, and increased driveway culvert sizes.	E	CRP	Property Protection

The Committee identified the various costs and benefits associated with each action. The estimated cost represents what the town estimates it will take in terms of dollars or staff hours to implement each action. Table 15 shows the costs as well as the various benefits (Pros) and costs (Cons) associated with each action.

Table 15: Mitigation Actions by Hazard Type – Estimated Cost & Pros/Cons

Hazard	Problem	Recommended Action	Estimated Cost	Pros	Cons
All	There are a number of hazards that could impact any building in Ashland at any time. Residents should be aware of how to protect their property and themselves.	Purchase and distribute an emergency preparedness guide for all hazards.	$1,500	This may reduce the number of unnecessary calls for assistance.	None
All	All residents should be more aware of the HMP.	Further educate the public regarding the Hazard Mitigation Plan through town communications such as the website and town bulletin.	< $1,500	Raises awareness of hazard planning and the steps that the town is taking	None
All	The HMP can be better utilized as a planning tool by the Planning Board, Budget Committee, and Selectmen.	Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2	$0 - Staff Time <10 hours	Can improve local planning efforts	None
All	The four existing CERT members are heavily burdened	Expand the local CERT team	$0 - Staff and volunteer 50 hours	May enable to the Team to be more productive and reduce the likelihood of burnout.	Many people are already serving on multiple committees
All	Residents and visitors should be aware of how to protect their property and themselves.	Provide education on all hazards via the town website	Staff time - 10 hours	Another method of reaching people.	None
All	The town needs better communications interoperability.	Upgrade Highway, Electric, and Water/Sewer departments to narrow band radios	$40,000	Better coordination	Cost

Hazard	Problem	Recommended Action	Estimated Cost	Pros	Cons
All	All residents should be more aware of the HMP.	Include Hazard Mitigation Plan information in the Town Report	$0 - Staff Time <10 hours	Raises awareness of hazard planning and the steps that the town is taking	None
All	Need a backup shelter	Establish secondary shelter arrangements at the American Legion building	Staff time 10 hours	Provides some flexibility in dealing with an event.	The American Legion Building has a limited capacity.
All	If power is lost at the Police Station/Town Office, the continuity of government and emergency response is jeopardized.	Install backup power at the police station/town office	$30,000	Maintains communications and continuity	Cost
All	Without a repeater, communications signals can be weak in certain areas of town. If power goes out, the Peppercorn Road repeater will fail.	Install generator at repeater on Peppercorn Road	$10,000	Better coordination	Cost
All	If power is lost at the Town Garage, the continuity of emergency response is jeopardized.	Install generator at Town Garage.	$40,000	Better coordination	Cost
Flooding	The Squam River overflows its banks flooding downtown	Add more regular sized sandbags to the town's supply for flooding	$1,500	Easily transportable, readily deployed	These do take some time to fill

Hazard	Problem	Recommended Action	Estimated Cost	Pros	Cons
Flooding	It is difficult to readily locate the various Dam Emergency Action Plans for Ashland.	Coordinate the storage and availability of Dam Emergency Action Plan files together so they can be accessed at the EOC.	Staff time 150 hours	Leads to greater coordination	Requires time
Flooding	Along the Squam River there is not a threshold for flood elevations, which is important for insurance and evacuation purposes.	Determine the base flood elevation on the Squam River	Staff time 10 hours & $5,000	Establishes a standard threshold	Cost as this requires additional engineering
Flooding	There is concern regarding flooding and spillage at the Sewer Lagoon.	Update and coordinate with the Sewer Commission regarding flood exposure at sewer lagoons from flooding and spillage on the Squam and Pemigewasset Rivers.	Staff time 20 hours	Better coordination	None
Flooding	The Collins Street bridge floods each spring making it impassable.	Address flooding concerns on the Collins Street Bridge to mitigate flood hazard	>$1 million	Protects infrastructure and enables continuous traffic flow	Cost
Flooding	Drainage along Thompson Street is poor.	Address Thompson Street drainage through ditching, catch basins, and increased driveway culvert sizes.	$1 million	Protects infrastructure and enables continuous traffic flow	Cost

E. PRIORITIZATION OF ACTIONS

After considering the Pros and Cons of each project, the Committee began to prioritize the various projects which had been identified. The standard method of prioritization is the STAPLEE method, which enables committee members to evaluate each action based on seven separate criteria. Committee members agreed to adapt the standard prioritization tool to better reflect the costs and benefits involved by scoring the benefit to the community and the costs involved separately. The benefit (PRO) score could range from 0 to 21 while the costs (CON) score could range from 0 to -21. The two scores were added to get a total score. Table 16 shows the Actions in order by their overall score. The total scores ranged from 21 to 13. For more detailed information about the STAPLEE scoring method and the detailed committee scores, see Appendix I).

Table 16: Recommended Mitigation Actions by Hazard and in Ranked Order

			STAPLEE		
Hazard	**Problem**	**Recommended Action**	**PRO**	**CON**	**TOTAL**
All	All residents should be more aware of the HMP.	Further educate the public regarding the Hazard Mitigation Plan through town communications such as the website and town bulletin.	21	0	**21**
All	The four existing CERT members are heavily burdened	Expand the local CERT team	21	0	**21**
Flooding	Along the Squam River there is not a threshold for flood elevations, which is important for insurance and evacuation purposes.	Determine the base flood elevation on the Squam River	21	0	**21**
All	The HMP can be better utilized as a planning tool by the Planning Board, Budget Committee, and Selectmen.	Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2	21	0	**21**
Flooding	There is concern regarding flooding and spillage at the Sewer Lagoon.	Update and coordinate with the Sewer Commission regarding flood exposure at sewer lagoons from flooding and spillage on the Squam and Pemigewasset Rivers.	21	0	**21**
All	There are a number of hazards that could impact any building in Ashland at any time. Residents should be aware of how to protect their property and themselves.	Purchase and distribute an emergency preparedness guide for all hazards.	21	-1	**20**
All	All residents should be more aware of the HMP.	Include Hazard Mitigation Plan information in the Town Report	21	-1	**20**
All	Need a backup shelter	Establish secondary shelter arrangements at the American Legion building	21	-1	**20**

			STAPLEE		
Hazard	**Problem**	**Recommended Action**	**PRO**	**CON**	**TOTAL**
Flooding	It is difficult to readily locate the various Dam Emergency Action Plans for Ashland.	Coordinate the storage and availability of Dam Emergency Action Plan files together so they can be accessed at the EOC.	21	-1	**20**
All	The town needs better communications interoperability.	Upgrade Highway, Electric, and Water/Sewer departments to narrow band radios	21	-2	**19**
All	Residents and visitors should be aware of how to protect their property and themselves.	Provide education on all hazards via the town website	21	-2	**19**
All	Without a repeater, communications signals can be weak in certain areas of town. If power goes out, the Peppercorn Road repeater will fail.	Install generator at repeater on Peppercorn Road	21	-3	**18**
All	If power is lost at the Police Station/Town Office, the continuity of government and emergency response is jeopardized.	Install backup power at the police station/town office	20	-5	**15**
Flooding	The Squam River overflows its banks flooding downtown	Add more regular sized sandbags to the town's supply for flooding	21	-6	**15**
All	If power is lost at the Town Garage, the continuity of emergency response is jeopardized.	Install generator at Town Garage.	20	-5	**15**
Flooding	The Collins Street bridge floods each spring making it impassable.	Address flooding concerns on the Collins Street Bridge to mitigate flood hazard	21	-8	**13**
Flooding	Drainage along Thompson Street is poor.	Address Thompson Street drainage through ditching, catch basins, and increased driveway culvert sizes.	21	-8	**13**

F. IMPLEMENTATION OF MITIGATION ACTIONS

There are many factors that influence how a town chooses to spend its energy and resources in implementing recommended actions. Factors include:

- Urgency
- How quickly an action could be implemented
- Likelihood that the action will reduce future emergencies
- Regulations required to implement the action
- Administrative burdens
- Time (both paid and volunteer)
- Funding availability
- Political acceptability of the action.

In the context of these factors, the Committee discussed the mitigation actions and utilized the STAPLEE method (Appendix I) as a guide to reach consensus regarding their relative level of priority, recognizing that some actions are of greater priority to different town departments. This implementation schedule contains a matrix (Table 17) indicating the estimated cost of implementation, potential funding sources, the parties responsible for bringing about these actions, and implementation time frame. Although a number of recommended mitigation actions received high scores, the time frame for which the actions are executed depend upon staff time and budgetary limitations.

During discussions about implementation, the Committee recognized that two actions needed to be added to the list (Action ID - H and O) and one action should be split into three separate actions (Action ID – F, G, and T). Action H addresses existing structures, the Community and Resource Protection goal, and long-term continuity. Action O addresses an existing structure, the Damage Prevention goal, and property protection. Actions F, G, and T were identified as separate actions to address to two related but somewhat different problems. Locally, engineering work has begun on addressing the road elevation near the Squam River which can address evacuation; this work actually has begun and should be completed within a year. A related concern expressed by a resident was over the fact that there is no base flood elevation determination in Ashland for the Squam River and the impact that may have on flood insurance policies. This work would have to be conducted by FEMA and the US Army Corps of Engineers. The first step is to get on their list of waterbodies to evaluate, the second step is the actual engineering and analysis, the timing of which would depend on federal priorities and funding.

These are listed in order of their Time Frame. To keep the plan current, the implementation schedule should be updated and re-evaluated on a regular basis as outlined in the monitoring section of this plan and progress tracked using the tools in Appendix K.

Table 17: Implementation Schedule for Mitigation Actions

Action ID	Hazard	Problem	Recommended Action	Estimated Cost	Potential Funding	Lead Party	Time Frame
A	All	All residents should be more aware of the HMP.	Further educate the public regarding the Hazard Mitigation Plan through town communications such as the website and town bulletin.	< $1,500	Operating Budget	Town Administrator, Selectmen	2013
B	All	The HMP can be better utilized as a planning tool by the Planning Board, Budget Committee, and Selectmen.	Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2	$0 - Staff Time <10 hours	Operating Budget	Town Administrator, Selectmen	2013
C	All	The four existing CERT members are heavily burdened	Expand the local CERT team	$0 - Staff and volunteer 50 hours	EMD Budget	EMD	2013
D	All	There are a number of hazards that could impact any building in Ashland at any time. Residents should be aware of how to protect their property and themselves.	Purchase and distribute an emergency preparedness guide for all hazards.	$1,500	EMD budget	EMD	2013
E	All	Residents and visitors should be aware of how to protect their property and themselves.	Provide education on all hazards via the town website	Staff time 10 hours	Operating Budget	EMD, Town Admin.	2013
F	Flooding	Along the Squam River there is not a threshold for flood elevations, which is important for evacuation purposes.	Conduct engineering study of the river side of River Street.	$5,000	Operating Budget	Ashland Electric Department	2013
G	Flooding	Along the Squam River there is not a threshold for flood elevations, which is important for insurance and evacuation purposes.	Get on the FEMA and US Army Corps of Engineers list for determining the base flood elevation on the Squam River.	Staff time 10 hours	Operating Budget	EMD, Town Administrator	2013

Action ID	Hazard	Problem	Recommended Action	Estimated Cost	Potential Funding	Lead Party	Time Frame
H	Terrorism, All Hazards	There is not direct communication between Emergency Services and the Ashland Elementary School.	Install narrow band digital radio communications in the Ashland Elementary School.	$10,000	Ashland Electric Department (noted in CIP)	EMD, Ashland Electric Department	2014
I	Flooding	There is concern regarding flooding and spillage at the Sewer Lagoon.	Update and coordinate with the Sewer Commission regarding flood exposure at sewer lagoons from flooding and spillage on the Squam and Pemigewasset Rivers.	Staff time 20 hours	Operating Budget	EMD	2014
J	Flooding	The Squam River overflows its banks flooding downtown	Add more regular sized sandbags to the town's supply for flooding	$1,500	Operating Budget	EMD	2014
K	Flooding	It is difficult to readily locate the various Dam Emergency Action Plans for Ashland.	Coordinate the storage and availability of Dam Emergency Action Plan files together so they can be accessed at the EOC.	Staff time 150 hours	Operating Budget, Grant	EMD	2014
L	All	All residents should be more aware of the HMP.	Include Hazard Mitigation Plan information in the Town Report	$0 - Staff Time <10 hours	Operating Budget	Town Administrator, Selectmen	2014
M	All	Need a backup shelter	Establish secondary shelter arrangements at the American Legion building	Staff time 10 hours	Operating Budget	EMD	2014
N	All	The town needs better communications interoperability.	Upgrade Highway, Electric, and Water/Sewer departments to narrow band radios	$40,000	Grant, Operating Budget	EMD	2014

Action ID	Hazard	Problem	Recommended Action	Estimated Cost	Potential Funding	Lead Party	Time Frame
O	Flooding	No mitigation has occurred to the one structure in town that has filed a repetitive loss.	Work with the owner of the repetitive loss property to mitigate future flood damage.	Staff time 20 hours	Operating Budget	EMD, Code Enforcement	2014
P	All	Without a repeater, communications signals can be weak in certain areas of town. If power goes out, the Peppercorn Road repeater will fail.	Install generator at repeater on Peppercorn Road	$10,000	Grant, Operating Budget	EMD	2015
Q	All	If power is lost at the Police Station/Town Office, the continuity of government and emergency response is jeopardized.	Install backup power at the police station/town office	$30,000	EMPG	Budget Comm., Town Admin., Select	2015
R	All	If power is lost at the Town Garage, the continuity of emergency response is jeopardized.	Install generator at Town Garage.	$40,000	Grant, Operating Budget	EMD	2017
S	Flooding	Drainage along Thompson Street is poor.	Address Thompson Street drainage through ditching, catch basins, and increased driveway culvert sizes.	$1 million	Operating Budget, HMPG	Town Administrator, PWD	2017
T	Flooding	Along the Squam River there is not a threshold for flood elevations, which is important for insurance and evacuation purposes.	Coordinate with FEMA and US Army Corps of Engineers to determine the base flood elevation on the Squam River	Staff time 10 hours (for local coordination)	Federal	EMD	2018
U	Flooding	The Collins Street bridge floods each spring making it impassable.	Address flooding concerns on the Collins Street Bridge to mitigate flood hazard	>$1 million	Operating Budget, HMPG, Sewer	Town Administrator, PWD	2018

CHAPTER VI: PLAN ADOPTION AND MONITORING

A. IMPLEMENTATION

The Ashland Hazard Mitigation Plan Update Committee, established by the EMD and Board of Selectmen, will meet annually to review the Plan and provide a mechanism for ensuring that an attempt is made to incorporate the actions identified in the plan into ongoing town planning activities. Essential elements of implementation require that all responsible parties for the various recommendations understand what is expected of them, and that they are willing to fulfill their role in implementation. It is therefore important to have the responsible parties clearly identified when the town adopts the final plan. Where appropriate it would be helpful to have any hazard mitigation activities identified in job descriptions.

As indicated in Section V.A., there are a variety of local planning mechanisms that the town can utilize to incorporate information or actions from the hazard mitigation plan including the Ashland Master Plan, Zoning Ordinance, Regulations, and the recently developed Capital Improvements Plan (CIP).

While most of these planning mechanisms fall under the purview of the town's planning board, the process of incorporation varies between the documents. Adoption of and amendments to the master plan, zoning ordinance, and regulations are addressed in NH RSA 675:1-7. The CIP is being developed by a committee authorized by the selectmen as indicated in NH RSA 674:5-8.

NH RSA 674:2 II(e) makes the recommendation that a natural hazard section may be included in the town master plan. Inclusion of this document as a section of the Ashland Master Plan, following the process set forth in RSA 675:6, provides an opportunity for issues addressed in this plan to be taken into consideration when planning for development within the community. The Ashland Hazard Mitigation Plan Committee recommended that this action be taken (Action ID - B) in conjunction with the Master Plan update that is currently in progress.

Incorporation of the HMP as a chapter of the Master Plan was a recommendation made as part of the last HMP; however, the Master Plan update was not completed prior to the update of this plan. Since the last HMP, the town has updated its building code and floodplain ordinance to better address Damage Prevention and Community and Resource Protection (Table 12).

Many of the actions in this plan rely on the town's operating budget along with grant funds available through FEMA and other sources such as those listed in Appendix B. The Emergency Management Director will coordinate with the Town Administrator, department heads, Budget Committee, and Selectmen to ensure that funds and staff time for these projects are maintained. The EMD will also coordinate with the NH HSEM Field Representative to ensure that the town applies for appropriate grant funds.

When appropriate, an effort will be made to incorporate this plan into the Emergency Operations Plan. Within a year after the town officially adopts the 2013 update to the Hazard Mitigation Plan, an attempt will be made to have hazard mitigation strategies integrated into these existing mechanisms and into all other ongoing town planning activities. In 2012 the town of Ashland

established a Capital Improvement Plan Committee to address long term (ten-year) budgeting issues for projects costing at least $5,000. It is to be updated annually. One of the recommended projects (Action ID - H) is specifically identified in the current version of the CIP. There are half a dozen other projects recommended in this plan that are not currently included in the CIP. The EMD and Town Administrator will work with department heads and the CIP Committee to determine whether these projects should be considered in future updates to the CIP.

B. PLAN MAINTENANCE & PUBLIC INVOLVEMENT

The Ashland Hazard Mitigation Planning Committee and the Selectboard, in order to track progress and update the mitigation strategies identified in Chapter V - D & E, will review the Ashland Hazard Mitigation Plan every year or after a hazard event. Town of Ashland Emergency Management Director is responsible for initiating this review and needs to consult with members of the Ashland Committee identified in this Plan. Changes will be made to the Plan to accommodate projects that have failed, are no longer consistent with the timeframe identified, are no longer consistent with the community's priorities, or lack funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, will be reviewed during the monitoring and update of this Plan to determine feasibility of future implementation. In keeping with the process of adopting the Plan, a public hearing will be held to receive public comment on the Plan.

Maintenance and updating will be held during the annual review period and the final product adopted by the Selectboard. The Committee will meet annually as part of this plan maintenance. The Emergency Management Director is also responsible for updating and resubmitting the plan to FEMA to be re-approved every five years. The EMD will convene a plan update committee in early 2017 to begin updating this plan before it expires.

On behalf of the Hazard Mitigation Committee, the Emergency Management Director, under direction of the Selectboard, will be responsible for ensuring that town's departments and the public have adequate opportunity to participate in the planning process during the Plan's annual review and during any Hazard Mitigation Committee meetings. Administrative staff may be utilized to assist with the public involvement process.

For each committee meeting, and the annual update process, techniques that will be utilized for public involvement include:

- Provide invitations to Budget Committee members;
- Provide invitations to municipal department heads;
- Post notices of meetings at the Town Hall, Fire Station, Library, and on the town website;
- Submit press releases for publication in the *Plymouth Record-Enterprise* and other appropriate newspapers or media outlets.

Entities to invite to future Hazard Mitigation plan updates include the Emergency Management Directors of the neighboring communities of Holderness, New Hampton, Bridgewater, and Plymouth.

C. **SIGNED CERTIFICATE OF ADOPTION**

(Note: To be replaced with signed copy upon completion.)

Certificate of Adoption – Town of Ashland

A resolution adopting the Ashland Hazard Mitigation Plan Update 2013

Plan dated: 2013
Conditionally approved: _____

WHEREAS, the town of Ashland received funding from the NH Office of Homeland Security and Emergency Management under a Flood Mitigation Project Assistance Grant and assistance from the Lakes Region Planning Commission for the preparation of the Ashland Hazard Mitigation Plan Update 2013; and

WHEREAS, several public planning meetings were held between April 2011 and January 2013 regarding the development and review of the Ashland Hazard Mitigation Plan Update 2013; and

WHEREAS, the Ashland Hazard Mitigation Plan Update 2013 contains several potential future projects to mitigate hazard damage in the town of Ashland and,

WHEREAS, a duly noticed public meeting was held by the Selectmen on _____ 2013 to formally approve and adopt the Ashland Hazard Mitigation Plan Update 2013.

NOW, THEREFORE BE IT RESOLVED that the Ashland Board of Selectmen adopts the Ashland Hazard Mitigation Plan Update, 2013.

ADOPTED AND SIGNED this day of _____ 2013.

ASHLAND BOARD OF SELECTMEN

_____
Jeanette I. Stewart, Chair

_____
Philip Preston, Vice Chair

_____
Norman DeWolfe, Selectman

Town Seal or Notary

_____

Date: _____

APPENDIX A: TECHNICAL RESOURCES

NH Homeland Security and Emergency Management 271-2231
http://www.nh.gov/safety/divisions/HSEM/
Hazard Mitigation Section 271-2231
http://www.nh.gov/safety/divisions/hsem/HazardMitigation/index.html

Federal Emergency Management Agency ..... (617) 223-4175
http://www.fema.gov/
FEMA, National Flood Insurance Program, Community Status Book
http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book

NH Regional Planning Commissions:
Central NH Regional Planning Commission 796-2129
http://www.cnhrpc.org/
Lakes Region Regional Planning Commission 279-8171
http://www.lakesrpc.org/
Nashua Regional Planning Commission 883-0366
http://www.nashuarpc.org/
North Country Council 444-6303
http://www.nccouncil.org/
Rockingham Regional Planning Commission 778-0885
http://www.rpc-nh.org/
Southern New Hampshire Regional Planning Commission 669-4664
http://www.snhpc.org/
Southwest Regional Planning Commission 357-0557
http://www.swrpc.org/
Strafford Regional Planning Commission 742-2523
http://www.strafford.org/
Upper Valley Lake Sunapee Regional Planning Commission 448-1680
http://www.uvlsrpc.org/

NH Governor's Office of Energy and Planning 271-2155
http://www.nh.gov/oep/index.htm
New Hampshire Floodplain Management Program
http://www.nh.gov/oep/programs/floodplainmanagement/index.htm

NH Department of Transportation 271-3734
http://www.nh.gov/dot/index.htm

NH Department of Cultural Affairs 271-2540
http://www.nh.gov/nhculture/
Division of Historical Resources 271-3483
http://www.nh.gov/nhdhr/

NH Department of Environmental Services 271-3503
http://www.des.state.nh.us/
Dam Bureau 271-3406
http://www.des.state.nh.us/organization/divisions/water/dam/index.htm

NH Municipal Association 224-7447
http://www.nhmunicipal.org/LGCWebsite/index.asp

NH Fish and Game Department 271-3421
http://www.wildlife.state.nh.us/

NH Department of Resources and Economic Development 271-2411
http://www.dred.state.nh.us/
Division of Forests and Lands 271-2214
http://www.nhdfl.org/
Natural Heritage Inventory 271-2215
http://www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
Division of Parks and Recreation 271-3255
http://www.nhstateparks.org/

NH Department of Health and Human Services 271-9389
http://www.dhhs.state.nh.us/

Northeast States Emergency Consortium, Inc. (NESEC) ..... (781) 224-9876
http://www.nesec.org/

US Department of Commerce ..... (202) 482-2000
http://www.commerce.gov/
National Oceanic and Atmospheric Administration ..... (202) 482-6090
http://www.noaa.gov/
National Weather Service, Eastern Region Headquarters
http://www.erh.noaa.gov/
National Weather Service, Tauton, Massachusetts ..... (508) 824-5116
http://www.erh.noaa.gov/er/box/
National Weather Service, Gray, Maine ..... (207) 688-3216
http://www.erh.noaa.gov/er/gyx/

US Department of the Interior
http://www.doi.gov/
US Fish and Wildlife Service 225-1411
http://www.fws.gov/
US Geological Survey 225-4681
http://www.usgs.gov/
US Geological Survey Real Time Hydrologic Data
http://waterdata.usgs.gov/nwis/rt
US Army Corps of Engineers ..... (978) 318-8087
http://www.usace.army.mil/

US Department of Agriculture
http://www.usda.gov/wps/portal/usdahome
US Forest Service ..... (202) 205-8333
http://www.fs.fed.us/

New Hampshire Electrical Cooperative ..... (800) 698-2007
http://www.nhec.com/

Cold Region Research Laboratory 646-4187
http://www.crrel.usace.army.mil/

National Emergency Management Association ..... (859) 244-8000
http://nemaweb.org

National Aeronautics and Space Administration
http://www.nasa.gov/
NASA Optical Transient Detector – Lightning and Atmospheric Research
http://thunder.msfc.nasa.gov/

National Lightning Safety Institute
http://lightningsafety.com/

The Tornado Project Online
http://www.tornadoproject.com/

National Severe Storms Laboratory
http://www.nssl.noaa.gov/

Plymouth State University Weather Center
http://vortex.plymouth.edu/

APPENDIX B: MITIGATION FUNDING RESOURCES

There are numerous potential sources of funding to assist with the implementation of mitigation efforts. Two lists of state and federal resources are provided on this and the following pages. Some of these may not apply or be appropriate for Ashland. The NH Homeland Security and Emergency Management Field Representative for Grafton County can provide assistance.

404 Hazard Mitigation Grant Program (HMGP) ..... NH Homeland Security and Emergency Management

406 Public Assistance and Hazard Mitigation..... NH Homeland Security and Emergency Management

Community Development Block Grant (CDBG) ..... NH HSEM, NH OEP, also refer to RPC

Dam Safety Program ..... NH Department of Environmental Services

Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service

Flood Mitigation Assistance Program (FMAP) ..... NH Homeland Security and Emergency Management

Highway Safety Improvement Program……. NH Department of Transportation

Mitigation Assistance Planning (MAP)..... NH Homeland Security and Emergency Management

Mutual Aid for Public Works.....NH Municipal Association

National Flood Insurance Program (NFIP) .....NH Office of Energy & Planning

Project Impact ..... NH Homeland Security and Emergency Management

Roadway Repair & Maintenance Program(s) .....NH Department of Transportation

Shoreline Protection Program..... NH Department of Environmental Services

Various Forest and Lands Program(s).....NH Department of Resources & Economic Development

Wetlands Programs..... NH Department of Environmental Services

Federal Mitigation Funding Sources

Federal Emergency Management Agency

Program	Details	Notes
Flood Mitigation Assistance Program (FMA)	Provides funding to implement measures to reduce or eliminate the long-term risk of flood damage http://www.fema.gov/government/grant/fma/index.shtm	States and localities
Hazard Mitigation Grant Program (HMGP)	Provides grants to implement long-term hazard mitigation measures after a major disaster declaration http://www.fema.gov/government/grant/hmgp/index.shtm	Open
National Flood Insurance Program (NFIP)	Enables property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages http://www.fema.gov/business/nfip/	States, localities, and individuals
Pre-Disaster Mitigation Program (PDM)	Provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event http://www.fema.gov/government/grant/pdm/index.shtm	States, localities and tribal governments

Environmental Protection Agency

The EPA makes available funds for water management and wetlands protection programs that help mitigate against future costs associated with hazard damage.

Mitigation Funding Sources Program	Details	Notes
Clean Water Act Section 319 Grants	Grants for water source management programs including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and regulation. http://www.epa.gov/OWOW/NPS/cwact.html	Funds are provided only to designated state and tribal agencies
Clean Water State Revolving Funds	State grants to capitalize loan funds. States make loans to communities, individuals, and others for high-priority water-quality activities. http://www.epa.gov/owow/wetlands/initiative/srf.html	States and Puerto Rico
Wetland Program Development Grants	Funds for projects that promote research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. http://www.epa.gov/owow/wetlands/initiative/#financial	See website

National Oceanic and Atmosphere Administration (NOAA)

NOAA is the major source for mitigation funding related to coastal zone management and other coastal protection projects.

Mitigation Funding Sources Program	Details	Notes
Coastal Services Center Cooperative Agreements	Funds for coastal wetlands management and protection, natural hazards management, public access improvement, reduction of marine debris, special area management planning, and ocean resource planning. http://www.csc.noaa.gov/funding/	May only be used to implement and enhance the states' approved Coastal Zone Management programs
Coastal Services Center Grant Opportunities	Formula and program enhancement grants for implementing and enhancing Coastal Zone Management programs that have been approved by the Secretary of Commerce. http://www.csc.noaa.gov/funding/	Formula grants require non-federal match
Coastal Zone Management Program	The Office of Ocean and Coastal Resource Management (OCRM) provides federal funding and technical assistance to better manage our coastal resources. http://coastalmanagement.noaa.gov/funding/welcome.html	Funding is reserved for the nation's 34 state and territory Coastal Zone Management Programs
Marine and Coastal Habitat Restoration	Funding for habitat restoration, including wetland restoration and dam removal. http://www.nmfs.noaa.gov/habitat/recovery/	Funding available for state, local and tribal governments and for- and non-profit organizations.

Floodplain, Wetland and Watershed Protection Programs

USACE and the U.S. Fish and Wildlife Service offer funding and technical support for programs designed to protect floodplains, wetlands, and watersheds.

Funding and Technical Assistance for Wetlands and Floodplains Program	Details	Notes
USACE Planning Assistance to States (PAS)	Fund plans for the development and conservation of water resources, dam safety, flood damage reduction and floodplain management. http://www.lre.usace.army.mil/planning/assist.html	50 percent non-federal match
USACE Flood Plain Management Services (FPMS)	Technical support for effective floodplain management. http://www.lrl.usace.army.mil/p3md-o/article.asp?id=9&MyCategory=126	See website
USACE Environmental Laboratory	Guidance for implementing environmental programs such as ecosystem restoration and reuse of dredged materials. http://el.erdc.usace.army.mil/index.cfm	See website
U.S. Fish & Wildlife Service Coastal Wetlands Conservation Grant Program	Matching grants to states for acquisition, restoration, management or enhancement of coastal wetlands. http://ecos.fws.gov/coastal_grants/viewContent.do?viewPage=home	States only. 50 percent federal share
U.S. Fish & Wildlife Service Partners for Fish and Wildlife Program	Program that provides financial and technical assistance to private landowners interested in restoring degraded wildlife habitat. http://ecos.fws.gov/partners/viewContent.do?viewPage=home	Funding for volunteer-based programs

Housing and Urban Development

The Community Development Block Grants (CDBG) administered by HUD can be used to fund hazard mitigation projects.

Mitigation Funding Sources Program	Details	Notes
Community Development Block Grants (CDBG)	Grants to develop viable communities, principally for low and moderate income persons. CDBG funds available through Disaster Recovery Initiative. http://www.hud.gov/offices/cpd/communitydevelopment/programs/	Disaster funds contingent upon Presidential disaster declaration
Disaster Recovery Assistance	Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of impacted homes. http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/assistance.cfm	Individuals
Neighborhood Stabilization Program	Funding for the purchase and rehabilitation of foreclosed and vacant property in order to renew neighborhoods devastated by the economic crisis. http://www.hud.gov/offices/cpd/communitydevelopment/programs/neighborhoodspg/	State and local governments and non-profits

Bureau of Land Management

The Bureau of Land Management (BLM) has two technical assistance programs focused on fire mitigation strategies at the community level.

Mitigation Funding Sources Program	Details	Notes
Community Assistance and Protection Program	Focuses on mitigation/prevention, education, and outreach. National Fire Prevention and Education teams are sent to areas across the country at-risk for wildland fire to work with local residents. http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html	See website
Firewise Communities Program	Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts. http://www.firewise.org/	See website

U.S. Department of Agriculture

There are multiple mitigation funding and technical assistance opportunities available from the USDA and its various sub-agencies: the Farm Service Agency, Forest Service, and Natural Resources Conservation Service.

Mitigation Funding Sources Agency Program	Details	Notes
USDA Smith-Lever Special Needs Funding	Grants to State Extension Services at 1862 Land-Grant Institutions to support education-based approaches to addressing emergency preparedness and disasters. http://www.csrees.usda.gov/funding/rfas/smith_lever.html	Population under 20,000
USDA Community Facilities Guaranteed Loan Program	This program provides an incentive for commercial lending that will develop essential community facilities, such as fire stations, police stations, and other public buildings. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population under 20,000
USDA Community Facilities Direct Loans	Loans for essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Community Facilities Direct Grants	Grants to develop essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Farm Service Agency Disaster Assistance Programs	Emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland and livestock damaged by natural disasters. http://www.fsa.usda.gov/	Farmers and ranchers
USDA Forest Service National Fire Plan	Funding for organizing, training, and equipping fire districts through Volunteer, State and Rural Fire Assistance programs. Technical assistance for fire related mitigation. http://www.forestsandrangelands.gov/	See website
USDA Forest Service Economic Action Program	Funds for preparation of Fire Safe plans to reduce fire hazards and utilize byproducts of fuels management activities in a value-added fashion. http://www.fs.fed.us/spf/coop/programs/eap/	80% of total cost of project may be covered
USDA Natural Resources Conservation Service Emergency Watershed Protection Support Services	Funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster. http://www.nrcs.usda.gov/programs/ewp/	See website
USDA Natural Resources Conservation Service Watershed Protection and Flood Prevention	Funds for soil conservation; flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land. http://www.nrcs.usda.gov/programs/watershed/index.html	See website

Health and Economic Agencies

Alternative mitigation programs can be found through health and economic agencies that provide loans and grants aimed primarily at disaster relief.

Federal Loans and Grants for Disaster Relief Agency Program	Details	Notes
Department of Health & Human Services Disaster Assistance for State Units on Aging (SUAs)	Provide disaster relief funds to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. http://www.aoa.gov/doingbus/fundopp/fundopp.asp	Areas designated in a Disaster Declaration issued by the President
Economic Development Administration (EDA) Economic Development Administration Investment Programs	Grants that support public works, economic adjustment assistance, and planning. Certain funds allocated for locations recently hit by major disasters. http://www.eda.gov/AboutEDA/Programs.xml	The maximum investment rate shall not exceed 50 percent of the project cost
U.S. Small Business Administration Small Business Administration Loan Program	Low-interest, fixed rate loans to small businesses for the purpose of implementing mitigation measures. Also available for disaster damaged property. http://www.sba.gov/services/financialassistance/index.html	Must meet SBA approved credit rating

Research Grants

The United States Geological Survey (USGS) and the National Science Foundation (NSF) provide grant money for hazard mitigation-related research efforts.

Hazard Mitigation Research Grants Agency Program	Details	Notes
National Science Foundation (NSF) Decision, Risk, and Management Sciences Program (DRMS)	Grants for small-scale, exploratory, high-risk research having a severe urgency with regard to natural or anthropogenic disasters and similar unanticipated events. http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423&org=SES	See website
U.S. Geological Survey (USGS) National Earthquake Hazards Reduction Program	The purpose of NEHRP is to provide products for earthquake loss reduction to the public and private sectors by carrying out research on earthquake occurrence and effects. http://www.usgs.gov/contracts/nehrp/	Community with a population under 20,000

APPENDIX C: PUBLICITY AND INFORMATION

Committee meetings were announced on the town of Ashland webpage calendar. Press releases similar to the one below were sent to the daily *Laconia Citizen* and weekly *Plymouth Record Enterprise* newspapers prior to the Committee meetings. Letters such as the one shown on page 59 were sent to the EMDs and LRPC Commissioners in each of the adjacent communities along with the Town Planner in Plymouth. The handout at the end of this appendix was used to introduce the committee to the plan update process.

LAKES REGION PLANNING COMMISSION
103 Main Street, Suite #3
Meredith, NH 03253
tel (603) 279-8171
fax (603) 279-0200
www.lakesrpc.org

June 29, 2012

For Immediate Release

Contact: David Jeffers, 279-8171, djeffers@lakesrpc.org

Town of Ashland Hazard Mitigation Plan Meeting

The Ashland Hazard Mitigation Plan Committee is in the process of updating its 2006 Hazard Mitigation Plan. The committee, which is represented by a variety of local interests, is focused on the natural and manmade hazards that put Ashland at risk as well as the development of recommendations to protect the safety and well being of town residents. The committee will hold its six meeting on July 6, 2012 at the Ashland Town Hall Meeting Room (20 Highland Street) starting at 8:00 AM. Residents of Ashland and representatives from neighboring communities are encouraged to attend and provide input.

At this upcoming meeting the committee will discuss a variety of proposed mitigation actions, discuss the benefits and costs of these actions, and methods of implementing these actions.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Ashland is being determined as a result of this process. With the update to the Hazard Mitigation Plan, community leaders will be able to prioritize actions to reduce the impacts of these and other hazards. Community leaders want the town to be a disaster resistant community and believe that updating the Hazard Mitigation Plan will bring Ashland one step closer to that goal.

For more information please call Lee V. Nichols, Emergency Management Director at 968-3083 or David Jeffers, Regional Planner, Lakes Region Planning Commission at 279-8171.

LAKES REGION PLANNING COMMISSION
103 Main Street, Suite 3
Meredith, NH 03253
Tel (603) 279-8171
Fax (603) 279-0200
www.lakesrpc.org

April 29, 2011

Chief Drake
6 Pinnacle Hill Road
New Hampton, NH 03256

Dear Chief Drake,

The Ashland Hazard Mitigation Plan Committee has begun to update their 2006 Hazard Mitigation Plan. The committee is represented by a variety of local interests including the Emergency Management Director, Police Chief, Road Agent, Water and Sewer departments, Town Administrator, Administrative Assistant, a representative from NH DHSEM, and a regional planner from the Lakes Region Planning Commission. The committee's focus will be on the natural and manmade hazards that put Ashland at risk, and the development of recommendations to protect the safety and well being of town residents. The committee will hold their second meeting on May 9 from 10:00am - 12:00am at the Ashland Town Offices, and will meet in the future on May 23 and June 13 at the same time. Representatives from neighboring communities are encouraged to attend and provide input, especially as it relates to regional or multi jurisdictional mitigation opportunities.

Hazard Mitigation Planning is important to reducing disaster losses, as are appropriate regulations and land use ordinances. The most significant areas of concern for Ashland will be determined as a result of this process. With the update to the Hazard Mitigation Plan, community leaders will be able to prioritize actions to reduce the impacts of these and other hazards. Community leaders want the town to be a disaster resistant community and believe that updating the Hazard Mitigation Plan will bring Ashland one step closer to that goal.

For more information please call the Lakes Region Planning Commission at 279-8171.

Regards,

Eric Senecal
Regional Planner

cc: Kimon Koulet, Executive Director, LRPC
Paul Branscombe, Town Administrator, Ashland
LRPC Commissioners – Ashland – Gordon McCormack, Jr. – Holderness – Todd Elgin and Robert Snelling – New Hampton – George Luciano
Bridgewater EMS Director, M. Tapio Mayo
Holderness Chief, Eleanor Mardin
Plymouth Planner, Sharron Penney
Plymouth Fire Chief, Casino Clogston

Local Hazard Mitigation Planning

Hazard Mitigation:

"Hazard Mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards"

Questions to address:

- Where are potential hazards?
- What are the risks?
- What are we already doing?
- Where are the gaps?
- What actions can be taken?
- What actions are feasible?
- What are our priorities?
- How will these actions be implemented?
- How will the plan be monitored?

What is a Hazard Mitigation Plan?

In cooperation with the NH Bureau of Emergency Management (BEM), the Lakes Region Planning Commission (LRPC) is working with several of its member communities each year to develop local Hazard Mitigation Plans.

The Hazard Mitigation Plans are designed to address each particular community's vulnerability to natural and man-made hazards. The local plan serves as a means to reduce future losses from hazard events before they occur. This local initiative is guided by a community-based Hazard Mitigation Planning Committee, with the LRPC providing technical support. The structure for plan development is provided through the *Guide to Hazard Mitigation Planning for New Hampshire Communities* which ensures that the community has considered the content of the State of New Hampshire Hazard Mitigation (409) Plan.

MITIGATION PROCESS

- IDENTIFY HAZARDS
- PROFILE HAZARD EVENTS
- INVENTORY ASSETS
- ESTIMATE LOSSES
- PRIORITIZE ACTION STEPS
- ADOPT THE PLAN
- IMPLEMENTATION

Why create a plan?

Development of a local Hazard Mitigation Plan is a chance for the community to assess the hazards that have the potential to threaten residents and their property. It also gives the community an opportunity to identify at-risk populations as well as resources within the community that might be at risk. The committee can then explore a variety of steps that might be put into place to help the community reduce damage and loss.

Having a Hazard Mitigation Plan in place, enables many communities to allocate their resources more effectively. It can also be a useful tool for leveraging additional sources of funding in the event of a disaster.

Federal Emergency Management Agency (FEMA) Requirement:

In order for communities to be eligible for the full spectrum of mitigation program funding, local hazard mitigation plans must be approved by FEMA. The staff of LRPC attend semi-annual hazard mitigation meetings and training programs that are designed to expedite the approval process.

Lakes Region Planning Commission
103 N. Main St., Suite #3
Meredith, NH 03253

(603) 279-8171 - phone
(603) 279-0200 - fax

L · R · P · C

Frequently asked questions

- **What will a Hazard Mitigation Plan cost?**

Since this project is funded by the NH Bureau of Emergency Management, the only cost to the community is the dedication of committee members' time and energy.

- **How is a Hazard Mitigation Plan different from an Emergency Action Plan?**

Although there is some overlap, these are different plans, each serving a different function in helping a community to minimize the potential for damage and loss in a community.

Emergency Action Plans (EAP) identifies potential hazard events and the resources available to address them; it also addresses how a community responds to an emergency.

A Hazard Mitigation Plan (HMP) also identifies potential hazard events and community resources. However, an HMP looks at the situation in terms of prevention instead of response. Gaps in coverage, programs, and structural needs are analyzed and specific mitigation steps are recommended and potential funding sources are identified.

- **Is this a community plan, a state plan, or a federal plan?**

The state of New Hampshire does require that each community develop an HMP. Once a plan is approved by FEMA and adopted by the community, should there be a need for Federal Mitigation money, more funding would be available. However, local public involvement is required. The local Emergency Management Director or a committee of citizens should help in plan development; there should also be several public presentations where citizens can make recommendations, provide input, and participate in development of the plan. In the end, the Board of Selectmen need to approve the plan.

Alton dam breach, 1996

The Essentials

At a minimum, each local Hazard Mitigation Plan should contain the following sections:

- An evaluation of the potential hazards within the community
- A description and analysis of local, state, and federal hazard mitigation policies, programs, and capabilities to mitigate the identified hazards in the area
- Goals, objectives, strategies and actions to reduce long-term vulnerability to hazards
- An evaluation of the costs and benefits of the recommended mitigation projects.

APPENDIX D: MEETING AGENDAS AND COMMITTEE PARTICIPATION

This section contains copies of the Committee meeting agendas and a summary of participation. All Committee meetings were held in the Ashland Town Office. Agendas were developed by the LRPC planner and meetings were chaired by the Emergency Management Director.

Ashland Hazard Mitigation Plan Update
Town Office - 10:00am – April 18, 2011

AGENDA

1. Introduction
2. What is Hazard Mitigation Planning?

   a. Mitigation planning vs. emergency response planning
3. Purpose of Committee
4. Set schedule for future meetings
5. Discussion on Development Trends in Ashland
6. Identify Critical Facilities on base map
7. Identify all hazards (past & potential) in Ashland and mark on map

   a. What are the hazards?
   b. What is at risk from those hazards?
8. Goals for next meeting:

   a. Risk Assessment
   b. Man-made hazards
   c. Hazards to Critical Facilities

Ashland Hazard Mitigation Plan Update
Town Office - 10:00am – May 9, 2011

AGENDA

1. Sign-in and Introductions
2. Review List of Critical Facilities
3. Review Risk Assessment Matrix
4. Discuss Existing Plans and Policies
5. Discuss Gaps in Protection
6. Adjourn

Ashland Hazard Mitigation Plan Update Committee
Town Office - 10:00am – May 23. 2011

AGENDA

1. Sign-in
2. Review Plans/policies/operations
3. Discuss roads/culverts
4. Review Gaps in Protection
5. Discuss STAPLEE and Brainstorm New Mitigation Strategies
6. Adjourn

Ashland Hazard Mitigation Plan Update Committee
Town Office - 10:00am – June 13. 2011

AGENDA

1. Sign-in
2. Review NFIP Compliance
3. Discuss roads/culverts
4. Evaluate mitigation strategies with STAPPLE worksheet

Ashland Hazard Mitigation Plan Update Committee

Ashland Town Office – June 15, 2012 – 9:00 AM

AGENDA

1. Introductions – people and the update process
2. Review and update of existing materials
    d. Community Profile *(attachments)*
    e. Development Trends *(attachments)*
    f. Critical Facilities *(attachment)*
3. Risk Assessment
    g. The "impact" of hazards
4. Status of 2006 Mitigation Actions *(attachment)*
5. Current Plans and Policies

Goals for next meeting:

1. Mitigation Actions, 2012
    h. Update list
    i. Cost of Mitigation Actions
    j. Prioritization
    k. Implementation

Ashland Hazard Mitigation Plan Update Committee

Ashland Town Office – July 6, 2012 – 8:00 AM

AGENDA

1. Update the list of Mitigation Actions
2. Estimate the Cost of these Mitigation Actions
3. Discuss the Pros and Cons of the Suggested Mitigation Actions
4. Prioritize the Mitigation Actions using the STAPLEE Method
5. Discuss Implementation

Meeting participation

Committee Member	Position	4/18/11	5/9/11	5/23/11	6/13/11	6/15/12	7/6/12	4/8/13
NH HSEM Field Representative	Paul Hatch					X	X	X
Ashland Town Clerk	Pat Tucker	X		X	X			
Ashland Electric + Ashland EMD	Lee Nichols	X	X	X	X	X	X	X
Ashland Water and Sewer	Robert Boyle	X	X	X	X			
Ashland Police Chief	Anthony Randall	X	X	X	X	X	X	X
Ashland Town Administrator	Paul Branscombe	X	X	X	X	X	X	X
Ashland Highway	Mark Ober	X			X			
Ashland resident	Joe Mazzone		X		X		X	X
Ashland Public Works, Director	Tim Paquette					X	X	X
Ashland Fire Chief	Stephen L. Heath					X	X	
New Hampton Fire Chief and EMD	Michael Drake		X					
Plymouth Fire Chief	Casino Clogston			X				
Ashland Board of Selectmen, Chair	Jeanette Stewart						X	X
LRPC, Planner	Eric Senecal	X	X	X	X			
LRPC, Planner	David Jeffers					X	X	X

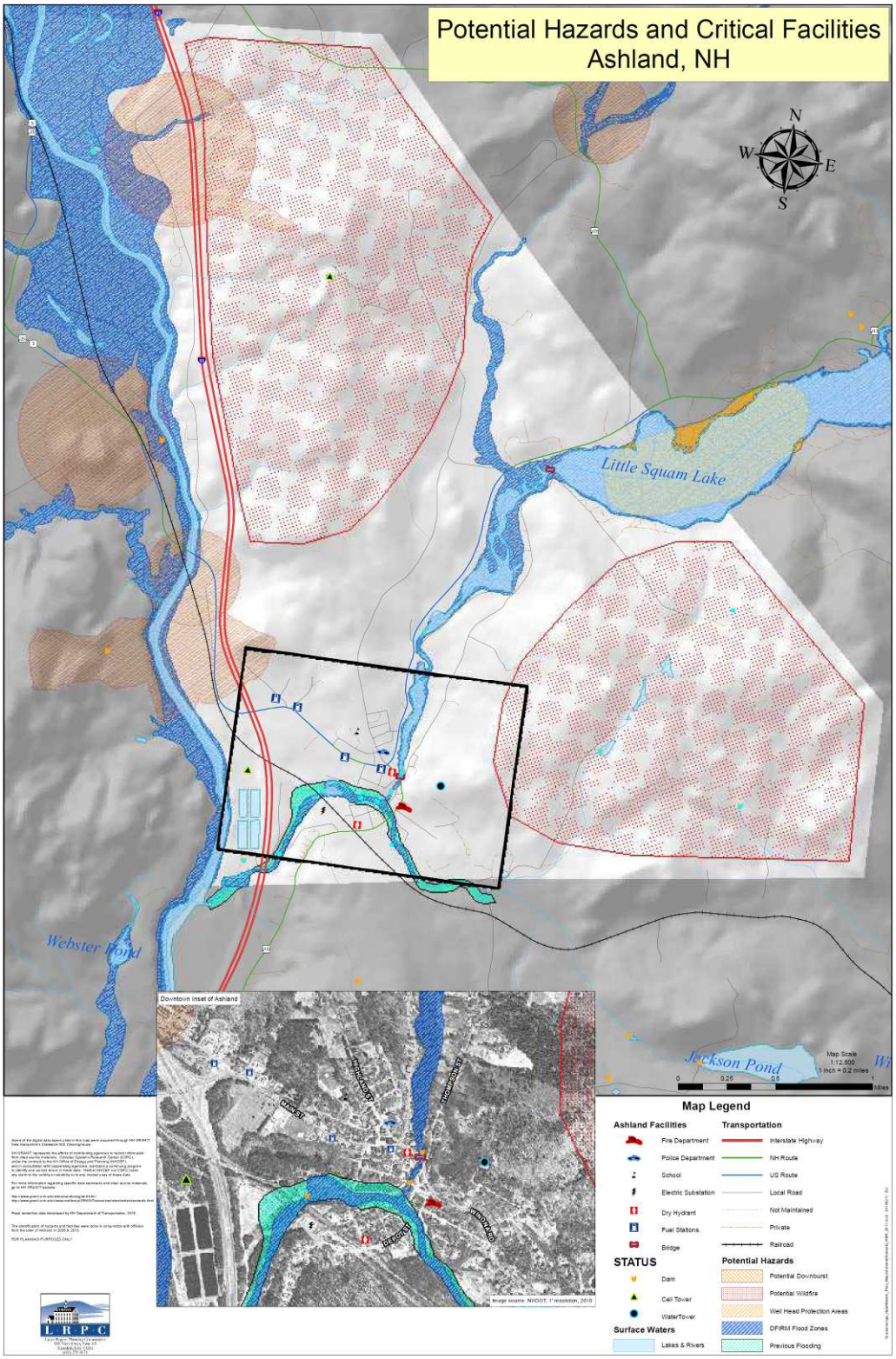
APPENDIX E: HAZARD EVENTS PRIOR TO 2007

Hazard	Date	Location	Impacts/Assessment
Tornado	July 14, 1963	Grafton County	F1, $3,000 in damages
Tornado	June 27, 1964	Grafton County	F0, $25,000 in damages
Tornado	August 11, 1966	Grafton County	F2, $250,000 in damages
Tornado	August 25, 1969	Grafton County	F1, $25,000 in damages
Tornado	July 21, 1972	Grafton County	F1, $25,000 in damages
Tornado	July 21, 1972	Grafton County	F1, $25,000 in damages
Tornado	May 11, 1973	Grafton County	F2
Tornado	June 11, 1973	Grafton County	F0
Downburst	July 6, 1999	Grafton County, Merrimack and Hillsborough	
Drought	1929-1936	Statewide	Regional
Drought	1939-1944	Statewide	Sever in Southeast
Drought	1947-1950	Statewide	Moderate
Drought	1960-1969	Statewide	Longest record continuous period of below normal precipitation.
Drought	June 1, 1999	Statewide	Governor's Office declaration moderate drought for most of the state.
Drought	Aug. – Dec. 2001	Statewide	Governor's Office declaration moderate drought for most of the state. Palmer Drought Severity Index was Moderate.
Earthquake	December 24, 1940	Carroll County	5.5 - felt over 400,000 square miles. Severe damage.
Flood	July 4, 1973	Grafton County	Fourteen bridges and many roadways were damaged which totaled $171,000.
Flood	July 1, 1986 - August 10, 1986	Statewide	Severe summer storms with heavy rains, flash flooding and severe high winds
Flood	August 7-11, 1990	Statewide	Wide spread flooding, a series of storm events with moderate to heavy rains
Flood	October 1, 1996	Grafton County	Heavy Rains
Flood	October - November 1995	Grafton County	Heavy Rains
Flood	June 1998	Bridgewater	Numerous road and culvert washouts. This led to the release of FEMA funding over the next two years for upgrades. 1 death.
Flood	Sept. 16-18, 1999	Grafton County	Remnants of Hurricane Floyd resulted in $570,500 of property damage. Power out to 10,000 customers.
Flood	September 12, 2003	Statewide	Severe storms and flooding
Flood	June 9, 2005	Southern Grafton County	Flash flooding resulted in $1.0 M in property damages.
Flood	October 26, 2005	Statewide	Severe storms and flooding
Flood	May 14 – 16, 2006	Grafton County	Up to 12 inches of rain in three days.
Flood	May, 12 - June 30, 2006	Statewide	Severe storms and flooding
Forest Fire	August 9, 2001	Grafton County	Fire caused by lightning burned 0.75 acres.

Hazard	Date	Location	Impacts/Assessment
Forest Fire	Summer 2006	Bristol	Bristol Peak had seven acre forest fire.
Lightning	April 12, 2001	Plymouth	Separate fires in apartment building and house.
Lightning	Sept. 4, 2003	Bristol	Damage to home electrical system and equipment totaled $10,000.
Lightning	June 27, 2005	Plymouth	Three separate strikes caused a barn fire, damage to Town Hall and communications and electronics equipment were damaged, and one injury. Total damages were $110,000.
Hurricane	September 9, 1991	Statewide	Hurricane Bob, severe storms
Hurricane	September 18- 19, 1999	Grafton County	Heavy Rains associated with tropical storms, Hurricane Floyd affected the area.
Blizzard	March 16, 1993	Statewide	High winds and record snowfall
Ice Storm	January 7, 1998	Statewide	In Grafton County there were moderate to severe conditions. 52 communities in the county were impacted, six injuries and one fatality; major roads closures, 67,586 without electricity, 2,310 without phone service, one communication tower, $17 million of damages. Some in Bridgewater were without power for six months.
Snow Storm	December 1, 1973	Grafton County	Two back-to-back snow storms
Snow Storm	March 16, 1993	Statewide	
Snow Storm	February 6, 2001	Grafton County	Accumulation of 34 inches
Snow Storm	March 28, 2001	Statewide	
Snow Storm	January 15, 2004	Statewide	
Snow Storm	March 30, 2005	Statewide	$6.5 million in public assistance. This storm had a heavy impact on Bridgewater.

Table Sources:
http://www.tornadoproject.com
New Hampshire Homeland Security and Emergency Management (NH HSEM)
National Oceanic and Atmospheric Administration (NOAA)
National transportation Safety Board (NTSB)
Federal Emergency Management Agency (FEMA)
Northeast States Emergency Consortium (NESEC)
National Interagency Fire Center (NIFC)

APPENDIX F: CRITICAL FACILITIES & POTENTIAL HAZARDS MAP



APPENDIX G: HAZARDS – SUPPLEMENTARY HAZARD INFORMATION

This section provides statewide or regional information regarding hazards. Some information is about hazards mentioned in the NH Hazard Mitigation Plan. Other information either provides context or extra detail which supplements the locally important information addressed in Chapter III.

I. FLOOD, WILDFIRE, DROUGHT

Flooding

Historically, the state's two largest floods occurred in 1936 and 1938. The 1936 flood was associated with snow melt and heavy precipitation. The 1938 flooding was caused by the Great New England Hurricane of 1938. Those floods prompted the construction of a series of flood control dams throughout New England, built in the 1950s and '60s. They continue to be operated by the US Army Corps of Engineers.[36]

A series of floods in New Hampshire began in October 2005 with a flood that primarily affected the southwest corner of the state and devastated the town of Alstead. The flood killed seven people. It was followed by floods in May 2006 and April 2007 and a series of floods during the late summer and early fall of 2008. The most recent flooding in the region was associated with Tropical Storm Irene in September 2011.

Flooding in the Lakes Region is most commonly associated with structures and properties located within a floodplain. There are numerous rivers and streams within the region and significant changes in elevation, leading to some fast-moving water. The region also has a great deal of shoreline, making it exposed to rising water levels as well. Although historically, there have not been many instances of shoreline flooding, the potential always exists for a major flood event to occur.

Recent rain events have proven this is becoming an increasing concern as additional development is contributing to flood hazards. As areas are covered with impervious surfaces, less water is allowed to infiltrate, evaporate, or be transpired by vegetative growth and more of it runs off directly into surface drainages and water bodies. This increases the likelihood of flash floods and substantial overland flow. Of greatest concern are the waterfront properties on the lakes, ponds, and associated tributaries.

Culvert improvements and roadwork have been conducted throughout the region as a result of localized flooding events. Of particular concern in the region are areas of steep slopes and soils with limited capacity to accept rapid volumes of rainwater. Roads and culverts in close proximity to these conditions are most at risk of localized flooding.

Flooding due to Dam Failure

Dam failure results in rapid loss of water that is normally held back by a dam. These types of floods can be extremely dangerous and pose a threat to both life and property. Dam classifications in New Hampshire are based on the degree of potential damages that a failure or disoperation of the dam is

[36] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html date visited: January 18, 2011

expected to cause. The classifications are designated as non-menace, low hazard, significant hazard, and high hazard and are summarized in greater detail in Table G-1.

The designations for these dams relate to damage that would occur if a dam were to break, not the structural integrity of the dam itself.

Table G-1: New Hampshire Dam Classifications[37]

Classification	Description
Non-Menace	A dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is: • Less than six feet in height if it has a storage capacity greater than 50 acre-feet; or • Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.
Low Hazard	A dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: • No possible loss of life. • Low economic loss to structures or property. • Structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassable or otherwise interrupt public safety services. • The release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than two-acre-feet and is located more than 250 feet from a water body or water course. • Reversible environmental losses to environmentally-sensitive sites.
Significant Hazard	A dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: • No probable loss of lives. • Major economic loss to structures or property. • Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services. • Major environmental or public health losses, including one or more of the following: • Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair. • The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more. • Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.
High Hazard	A dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of: • Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions. • Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot. • Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services. • The release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII. • Any other circumstance that would more likely than not cause one or more deaths.

[37] NH DES Fact Sheet WD-DB-15 "Classification of Dams in New Hampshire", http://des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf. Accessed October 1, 2012.

Dams in New Hampshire are classified by the New Hampshire Department of Environmental Services Dams Bureau. The four dam hazard classifications (High, Significant, Low, and Non-Menace) are based on the potential losses associated with a dam failure (See Appendix G for detailed descriptions). High (H) and Significant (S) Hazard dams have the highest potential for damage; this could include damage to state or municipal roadways. There are eight active dams in Ashland (Table 8); two High Hazard, one Significant Hazard, two Low (L) Hazard, and three Non-Menace (NM) Hazard dams; the two High Hazard dams are in the Village area.

Table G-2: Active dams in Ashland

Hazard Class	NAME	RIVER	IMPOUND (Acre-Ft.)	HEIGHT (Feet)	DRAINAGE AREA (Sq. Mi.)
H	SQUAM LAKE DAM	SQUAM RIVER	7173.00	18.00	57.80
H	GRIST MILL POND DAM	SQUAM RIVER	25.00	16.00	58.60
S	ASHLAND SEWAGE LAGOON DAM	NA	3.00	15.00	0.00
L	ASHLAND PAPER MILL MIDDLE DAM	SQUAM RIVER	5.00	18.00	59.00
L	PETTITT DAM	UNNAMED STREAM	1.90	8.00	0.20
NM	COLD SPRING BROOK DAM	COLD SPRING BROOK	1.50	4.00	1.25
NM	PRESTON DAM	RUNOFF	0.25	10.00	0.25
NM	L W PACKARD POWER DAM	SQUAM RIVER	0.01	12.00	58.70

History: There have been no known dam failures in Ashland.

Ice Jam

Ice forming in riverbeds and against structures often presents significant hazardous conditions for communities. Meltwater or stormwater may encounter these ice formations and apply lateral and/or vertical force upon structures. Moving ice may scour abutments and riverbanks. Ice may also create temporary dams. These dams can create flood hazard conditions where none previously existed. According to the Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL), 43% of New Hampshire ice jams have occurred in March and April during the ice breakup on the rivers, while 47% of ice jams occurred in January and February during either ice freeze up or ice break up periods.[38]

Wildfire

Several areas in the Lakes Region are relatively remote in terms of access and fire fighting abilities. Of greatest concern are those areas characterized by steep slopes and vast woodlands, with limited vehicular access. These areas include the Ossipee, Squam, Belknap, and Sandwich Mountain Ranges.

New Hampshire has about 500 wild land fires each year; most of these burn less than half an acre. There have been fires in Ashland but due to a low fuel load and limited development in the forested areas of town, it was not viewed as a major concern. While both the number of fires and the acres

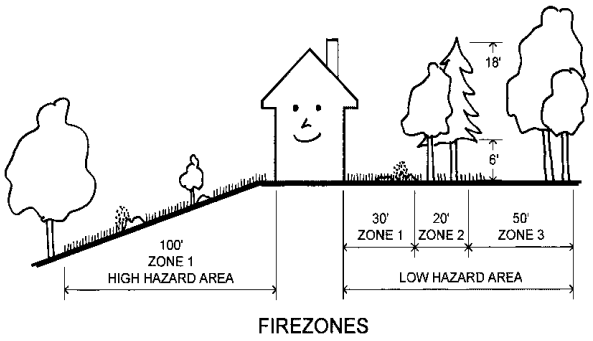
[38] "Ice Jams in New Hampshire," CRREL, http://www.crrel.usace.army.mil/ierd/tectran/IERD26.pdf visited February 8, 2011

burned in Grafton County have increased nearly every year since 2007, less than twenty acres burned in any single year.[39]

As these once remote areas begin to see more development (the urban wildfire interface), care should be taken to ensure that adequate fire protection and buffers are established. Techniques include increased buffers between wooded areas and residential buildings, requirements for cisterns or fire ponds, a restriction on the types of allowable building materials such as shake roofs, and special considerations for landscaping. While historically massive wildfires have been western phenomena, each year hundreds of woodland acres burn in New Hampshire. The greatest risk exists in the spring when the snow has melted and before the tree canopy has developed, and in the late summer – early fall. Appropriate planning can significantly reduce a community's vulnerability for woodland fires. There are four-zone suggestions from the Firewise community program that could be potentially helpful for Ashland's homeowners.[40]

ZONE 4 is a natural zone of native or naturalized vegetation. In this area, use selective thinning to reduce the volume of fuel. Removing highly flammable plant species offers further protection while maintaining a natural appearance.

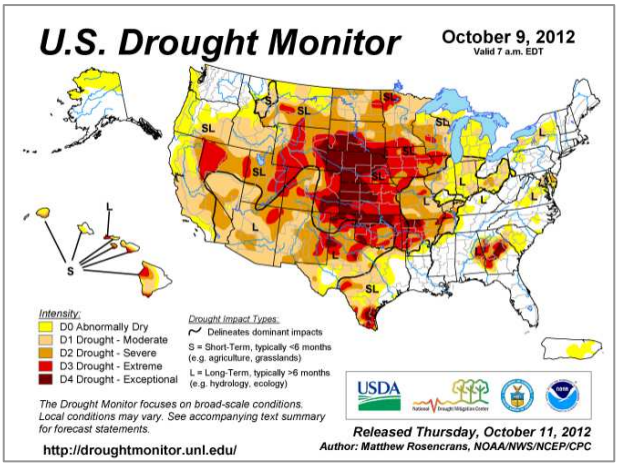
ZONE 3 is a low fuel volume zone. Here selected plantings of mostly low-growing and fire-resistant plants provide a decreased fuel volume area. A few well-spaced, fire resistant trees in this zone can further retard a fire's progress.



FIREZONES

ZONE 2 establishes a vegetation area consisting of plants that are fire resistant and low growing. An irrigation system will help keep this protection zone green and healthy.

ZONE 1 is the protection area immediately surrounding the house. Here vegetation should be especially fire resistant, well irrigated and carefully spaced to minimize the threat from intense flames and sparks.



Drought

Drought occurs when less than the normal amount of water is available for extended periods of time. Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include reduced

[39] NH Division of Forests and Lands http://www.nhdfl.org/fire-control-and-law-enforcement/fire-statistics.aspx, June 2, 2012.

[40] http://www.firewise.org accessed September 21, 2012.

rain/snowfall, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies.

Since 1990 New Hampshire has had a state Drought Emergency Plan, which identifies four levels of action indicating the severity of the drought: Alert, Warning, Severe, and Emergency. There have been five extended droughts in New Hampshire in the past century: 1929 – 1936, 1939 – 1944, 1947 – 1950, 1960 – 1969, and 2001 – 2002.[41] While much of the country experienced drought conditions in 2012, New Hampshire received adequate precipitation.[42]

II. GEOLOGICAL HAZARDS

Earthquake

Notable New Hampshire earthquakes are listed in Table G-2 with the extent of the hazard expressed in the Modified Mercalli Intensity scale and the Richter Magnitude.[43]

Table G-2: NH Earthquakes of magnitude or intensity 4 or greater (1638-2007).

Location	Date	MMIntensity	Magnitude
Ossipee	December 24, 1940	7	5.5
Ossipee	December 20, 1940	7	5.5
Ossipee	October 9, 1925	6	4
Laconia	November 10, 1936	5	-
New Ipswich	March 18, 1926	5	-
Lebanon	March 5, 1905	5	-
Rockingham County	August 30, 1905	5	-
Concord	December 19, 1882	5	-
Exeter	November 28, 1852	5	-
Portsmouth	November 10, 1810	5	4
Off Hampton	July 23, 1823	4	4.1
15km SE of Berlin	April 6, 1989	-	4.1
5km NE of Berlin	October 20, 1988	-	4
W. of Laconia	January 19, 1982	-	4.7
Central NH	June 11, 1638	-	6.5

Landslide

A landslide is the downward or outward movement of slope-forming materials reacting to the force of gravity, including mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows. Landslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Seismic activity may play a role in the mass movement of landforms also. Although New Hampshire is mountainous, it consists largely of relatively old geologic formations that have been worn by the forces of nature for eons. Consequently, much of the landscape is relatively stable and the exposure to this hazard type is

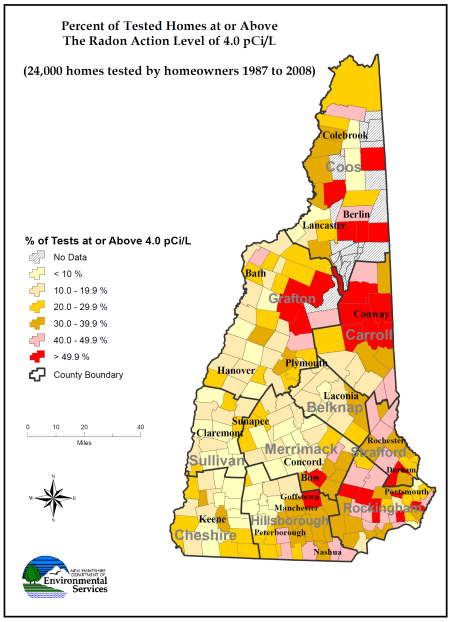
[41] http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf visited February 8, 2011.
[42] US Drought Monitor http://droughtmonitor.unl.edu/. Accessed October 9, 2012.
[43] http://earthquake.usgs.gov/learn/topics/mag_vs_int.php, visited June 8, 2012.

generally limited to areas in the north and north central portion of the state. Formations of sedimentary deposits and along the Connecticut and Merrimack Rivers also create potential landslide conditions.

Although the overall vulnerability for landslides in the state is low, there is considerable terrain susceptible to landslide action. This was exemplified in May of 2003 when the Old Man of the Mountain collapsed. The continuous action of freezing and thawing of moisture in rock fissures causes it to split and separate. This action occurs frequently on the steeply sloped areas of the state, increasing the risk of landslides. In addition to being susceptible to this freeze/thaw process, the Ossipee Mountain Range, Squam Range, and other mountains throughout the Lakes Region are also close to seismic faults and at risk to increased pressure to development. Consideration must be given to the vulnerability of man-made structures in these areas due to seismic- and/or soils saturation-induced landslide activity. Landslide activities are also often attributed to other hazard events. For example, during a recent flood event, a death occurred when a mass of saturated soil collapsed. This death was attributed to the declared flood event.[44] Also, during the 2007 Nor'easter a landslide occurred in Milton, resulting in the temporary closure of NH Route 101.

Radon

Radon is a naturally occurring colorless, odorless radioactive gas usually associated with granite rock formations. The gas can seep into basements through the air. It can also be transported via water and is released once the water is aerated, such as during a shower. Extended exposure to radon can lead to higher rates of cancer in humans. Radon is not a singular event – it can take years or decades to see the effects. The NH Office of Community and Public Health's Bureau of Radiological Health indicates that one third of homes in New Hampshire have indoor radon levels that exceed the US Environmental Protection Agency's "action level" of 4 pCi/l.[45] The map at the right indicates that 10 – 20% of the homes in Ashland exceeded the recommended limit of 4.0 pCi/l in state-wide testing conduct over the past twenty years.[46]



III. Severe Wind

The Lakes Region is at risk of several types of natural events associated with high winds, including nor'easters, downbursts, hurricanes and tornadoes. The northeast is located in a zone that should be built to withstand 160 mile an hour wind gusts. A large portion of the northeast, including the Lakes Region, is in a designated hurricane susceptible region.

[44] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html visited February 8, 2011.
[45] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html visited February 8, 2011.
[46] NH DES Radon Program http://des.nh.gov/organization/divisions/air/pehb/ehs/radon/index.htm, accessed October 9, 2012.

Tornado/Downburst

Although tornadoes are locally produced, damage paths can be in excess of one mile wide and 50 miles long.[47] The Fujita Scale is used to measure the intensity of a tornado (or downburst) by examining the damage caused in the aftermath, shown in Table G-3.[48] An F2 tornado ripped through a 50-mile section of central NH in July of 2008 from Epsom to Ossipee leading to requests for federal disaster declarations in several counties.[49]

Table G-3: The Fujita Scale

F-Scale #	Intensity Phrase	Wind Speed	Type of Damage
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted.
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: http://www.tornadoproject.com/fscale/fscale.htm

The major damage from downbursts come from falling trees, which may take down power lines, block roads, or damage structures and vehicles. New Hampshire experienced three such events in the 1990s. One event occurred in Moultonborough on July 26, 1994 and was classified as a macroburst. It affected an area one-half mile wide by 4-6 miles in length. This same storm produced wind damage typical of a micro/macroburst in nearby Meredith.

The tornado/downburst risk for an individual community in New Hampshire is relatively low compared to many other parts of the country. Though the danger that these storms present may be high, the frequency of these storms is relatively low to moderate.

[47] FEMA Hazards: Tornadoes http://www.fema.gov/business/guide/section3e.shtm, visited February 8, 2011.
[48] http://www.tornadoproject.com/fscale/fscale.htm visited March 8, 2011.
[49] http://www.fema.gov/news/newsrelease.fema?id=45525 visited March 8, 2011.

Hurricane

Hurricanes are severe tropical storms that have winds at least 74 miles per hour. In the Lakes Region they could produce heavy rain and strong winds that could cause flooding or damage buildings, trees, power lines, and cars.[50] Hurricanes are measured by the Saffir-Simpson Hurricane Scale: a 1-5 rating based on a hurricane's intensity using wind speed as the determining factor (Table G-4). The scale is used to give an estimate of the potential property damage and flooding expected from a hurricane landfall.

Table G-4: Saffir-Simpson Hurricane Scale

Category	Characteristics
1	Winds 74-95 mph (64-82 kts or 119-153 km/hr). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.
2	Winds 96-110 mph (83-95 kts or 154-177 km/hr). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.
3	Winds 111-129 mph (96-113 kts or 178-209 km/hr). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Flooding near the coast destroys smaller structures with larger structures damaged by battering from floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.
4	Winds 130-156 mph (114-135 kts or 210-249 km/hr). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).
5	Winds greater than 156 mph (135 kts or 249 km/hr). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Source: http://www.nhc.noaa.gov/aboutsshs.shtml

According to NOAA, 2010 was one of the busiest hurricane seasons on record.[51] However, the position of the jet stream kept the northeastern Atlantic region dry as a barrier to the storms. New Hampshire has not experienced a severe hurricane since 1938. On September 21, 1938, a Category 3 hurricane claimed 13 lives in New Hampshire and many more throughout New England. Official records at the Weather Bureau in Concord show sustained winds of 56 miles per hour, but around the state, gusts around 100 miles per hour were reported, mostly due to topographical acceleration.

[50] http://www.fema.gov/hazard/hurricane/hu_about.shtm, visited January 25, 2011.
[51] http://www.noaanews.noaa.gov/stories2010/20101129_hurricaneseason.html visited January 25, 2011.

The Merrimack River rose nearly 11 feet above its flood stage, *The Hanover Gazette* reported that in New Hampshire, 60,000 people were homeless and many areas were without power. Damages were estimated at $22 million.[52] Hurricane Bob, a category 2 storm, in 1991, was declared a major federal disaster in New Hampshire and is recorded as a severe storm in the state's history.[53]

Lightning

Thunderstorms have several threats associated with them including heavy rain, high wind, and hail. In a heavy rain storm, large amounts of rain may fall in a short period of time, severely impacting roads and low-lying developments. The discharge of lightning causes an intense sudden heating of air. The air rapidly expands when heated then contracts as it cools, causing a shock wave that we hear as thunder. This shock wave is sometimes powerful enough to damage windows and structures. Lightning damages cost the insurance industry more than $5 billion annually in the United States.[54]

Hail

High winds can bring down limbs and trees, knocking out electricity and blocking roads. Hail can cause damage to crops and structural damage to vehicles. Hail is measured by the TORRO intensity scale, shown in Table G-5. Although hailstorms are not particularly common in the Lakes Region, which averages fewer than two hailstorms per year, several have occurred in New Hampshire in the last few years. In 2007 and 2008 nearby Laconia experienced hail storms with no resulting damage, though reported hail sizes were as large as 1.25 inches (H4).

Table G-5: TORRO Hailstorm Intensity Scale

Code	Diameter	Description	Typical Damage
H0	5-9 mm*	Pea	No damage
H1	10-15 mm	Mothball	Slight damage to plants, crops
H2	16-20 mm	Marble, grape	Significant damage to fruit, crops, vegetation
H3	21-30 mm	Walnut	Severe damage to fruit/crops, damage to glass/plastic structures, paint & wood scored
H4	31-40 mm	Pigeon's egg	Widespread glass damage, vehicle bodywork damage
H5	41-50 mm	Golf ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	51-60 mm	Hen's egg	Aircraft bodywork dented, brick walls pitted
H7	61-75 mm	Tennis ball	Severe roof damage, risk of serious injuries
H8	76-90 mm	Large orange	Severe damage to aircraft bodywork
H9	91-100 mm	Grapefruit	Extensive structural damage. Risk of severe or fatal injuries to exposed persons
H10	>100 mm	Melon	Extensive structural damage. Risk of severe or fatal injuries to exposed persons

***mm** = millimeters (Approximate range since other factors (e.g. number, density of hailstones, hail fall speed, surface wind speed) affect severity
Source: http://www.torro.org.uk/torro/severeweather/hailscale.php

V. OTHER HAZARDS

The Lakes Region, as its name suggests, is comprised of many surface water bodies. Many of the towns in the region depend on a portion of this resource to provide public drinking water to the community. Area tourism and water recreation are also highly dependent on the availability of clean and attractive water resources. For these reasons the protection of surface and ground waters in the Lakes Region is highly valued both as a necessity and for economic reasons. The leading potential sources of water contamination include in-transit and fixed hazardous materials.

[52] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html, visited January 25, 2011.
[53] http://www.fema.gov/news/event.fema?id=2118 visited January 25, 2011
[54] *National Lightning Safety Institute webpage,* http://www.lightningsafety.com/nlsi_lls/nlsi_annual_usa_losses.htm visited February 8, 2011.

Motor Vehicle Accident involving Hazardous Materials

Hazardous materials, i.e., chemicals and chemical compounds in many forms, are found virtually everywhere - in common household products; agricultural fertilizers and pesticides; carried by vehicles as fuels, lubricants, and transported products; and, used in business and industrial processes. When improperly used, released, or spilled, they can burn or explode, diffuse rapidly through the air or in water, and endanger those who come in contact with them.

Chemicals of all types are used, stored, and transported throughout the Lakes Region. The types and locations of many of these hazardous materials are unknown. While the New Hampshire Department of Environmental Services maintains a database of hazardous waste generators and underground storage tanks located in the state, detailed information on the types and volume of hazardous materials that are transported through the region is not documented. Likewise, only a small portion of the stored hazardous materials are reported and cataloged. Thus, there is a potential of a hazardous material incident at every transportation accident or fire in the area. Further, there is extensive use of liquefied gases for heating in the area, which means that significant amounts are transported, by both vehicle and major gas pipelines, and stored in the region.

APPENDIX H: CRITICAL FACILITIES-VULNERABILITY

Ashland Critical Facilities Hazard Vulnerability Key: Low = 1, High = 3

Facility/Infrastructure	Flood	Dam Failure	Drought	Conflagration	Extreme Heat	Wildfire	Earthquake	Lightning	Hurricane	Tornado/ Downburst	Hail	Blizzard	Ice Storm	Town-wide power loss	Hazardous materials spill	Epidemic	Drinking Water Contamination	Bioterrorism	TOTAL
Primary Response Facilities																			
Fire Station (EOC)	1	1	1	2	1	1	3	2	2	2	1	3	2	2	2	1	2	2	**31**
Town Offices (Police)	1	1	1	2	1	1	2	2	2	2	1	2	2	3	2	1	1	1	**28**
Highway & Electric Departments	1	1	1	2	1	1	2	2	2	2	1	3	2	3	2	1	1	2	**30**
Populations and Places to Protect																			
Ashland Elementary	1	1	1	2	1	1	2	2	2	2	2	3	3	3	1	2	1	2	**32**
William J. Tirone Gymnasium	1	1	1	1	1	1	2	2	2	2	1	1	1	2	1	1	1	1	**23**
Common Man Commons	1	1	1	1	2	1	2	2	2	2	2	2	2	1	3	3	1	1	**30**
Transfer Station	1	1	1	1	1	1	2	1	2	2	1	1	1	2	2	1	2	2	**25**
White Mt. Court (Elderly housing)	1	1	1	2	2	1	2	2	2	2	2	3	2	3	1	3	1	1	**32**
PSNH Facility	1	1	1	1	1	1	2	2	2	2	1	2	2	3	1	1	1	2	**27**
Town Well Head	2	1	1	1	1	1	1	2	1	2	1	1	1	1	3	1	3	3	**27**
Water Tower	1	1	1	1	1	1	2	2	1	2	1	1	1	1	1	1	3	3	**25**
Waste Water Treatment Facility	3	2	1	1	1	1	2	1	2	2	1	1	1	1	3	1	1	1	**26**
Pumping Station (Riverside Drive)	2	3	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1	1	**24**
Pumping Station (148 River Street)	2	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1	1	**22**

Facility/Infrastructure	Flood	Dam Failure	Drought	Conflagration	Extreme Heat	Wildfire	Earthquake	Lightning	Hurricane	Tornado/ Downburst	Hail	Blizzard	Ice Storm	Town-wide power loss	Hazardous materials spill	Epidemic	Drinking Water Contamination	Bioterrorism	TOTAL
Pumping Station (242 River Street)	2	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1	1	**22**
Pump Station #4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**18**
Cell Tower	1	1	1	1	1	2	2	3	2	2	1	1	2	1	1	1	1	1	**25**
Repeater Pole	1	1	1	1	1	3	2	2	2	2	1	1	2	3	1	1	1	1	**27**
Squam Lake Dam	1	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1	1	**21**
Grist Mill Dam	2	2	1	1	1	1	1	1	2	2	1	1	2	3	1	1	1	3	**27**
Squam River Power	2	2	1	1	1	1	2	1	2	2	1	1	2	3	1	1	1	2	**27**
Jackson Pond Dam (New Hampton)	1	1	1	1	1	1	2	1	2	2	1	1	2	3	1	1	1	2	**25**
French River Dam	2	2	1	1	1	1	2	1	2	1	1	2	3	1	1	1	1	2	**26**
Total	**32**	**29**	**23**	**28**	**25**	**26**	**44**	**36**	**43**	**44**	**26**	**35**	**38**	**44**	**33**	**28**	**29**	**37**	

APPENDIX I: STAPLEE RESULTS

Using the STAPLEE method the Committee reviewed seven categories for each action. These categories addressed **S**ocial/community acceptance, **T**echnical feasibility, **A**dministrative workability, **P**olitical acceptance, **L**egality, **E**conomic concerns, and **E**nvironmental impacts. As the Committee began the process of prioritizing these actions, the group agreed to modify the standard tool for project prioritization, the STAPLEE Method to more accurately reflect the benefits and costs associated with each action. The Benefit score in each of the seven categories could range from 0 (no benefit) to 3 (substantial benefit) and the Cost score could range from 0 (no cost) to -3 (significant costs). The maximum Benefit score was 21, the greatest Cost score could be -21. The two scores were added together to arrive at an overall STAPLEE score.

The Committee ended up with very high Benefit scores (all were either 20 or 21) and Cost scores ranging from 0 to -8. This ended up with Total STAPLEE scores ranging from 13 to 21.

Project Rating: **Score the benefits of each project in each category:** 0 is neutral, 1 has slight benefits, 2 has moderate benefits, 3 has substantial benefits. **Score the costs** of each project in each category: 0 is neutral, -1 has minor costs, -2 has moderate costs, -3 has significant costs	Social - Community Accept	Social - Community Accept	Technically Feasible	Technically Feasible	Administratively Workable	Administratively Workable	Politically Acceptable	Politically Acceptable	Legally Workable	Legally Workable	Economic	Economic	Environmental Impacts	Environmental Impacts	**TOTAL - BENEFIT**	**TOTAL - COST**	**Total**
Ashland	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	
Hold a public hearing to allow the public to become even more familiar with the Hazard Mitigation Plan.	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**0**	**21**
Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**0**	**21**
Determine the base flood elevation on the Squam River	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**0**	**21**

Project Rating: **Score the benefits of each project in each category:** 0 is neutral, 1 has slight benefits, 2 has moderate benefits, 3 has substantial benefits. **Score the costs** of each project in each category: 0 is neutral, -1 has minor costs, -2 has moderate costs, -3 has significant costs	Social - Community Accept	Social - Community Accept	Technically Feasible	Technically Feasible	Administratively Workable	Administratively Workable	Politically Acceptable	Politically Acceptable	Legally Workable	Legally Workable	Economic	Economic	Environmental Impacts	Environmental Impacts	**TOTAL - BENEFIT**	**TOTAL - COST**	**Total**
Ashland	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	
Expand the local CERT team	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**0**	**21**
Update and coordinate with the Sewer Commission regarding flood exposure at sewer lagoons from flooding and spillage on the Squam River.	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**0**	**21**
Include Hazard Mitigation Plan information in the Town Report	**3**	**-1**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**-1**	**20**
Purchase and distribute an emergency preparedness guide for all hazards.	**3**	**-1**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**-1**	**20**
Coordinate the storage and availability of Dam Emergency Action Plan files together so they can be accessed at the EOC.	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**-1**	**20**
Establish secondary shelter arrangements at the American Legion building	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**21**	**-1**	**20**
Label unique 911 addresses to all pumping stations.	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**0**	**21**	**-1**	**20**
Provide education on all hazards via the town website	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**0**	**21**	**-2**	**19**
Upgrade Highway, Electric, and Water/Sewer departments to narrow band radios by 2013	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-2**	**3**	**0**	**21**	**-2**	**19**

Project Rating: **Score the benefits of each project in each category:** 0 is neutral, 1 has slight benefits, 2 has moderate benefits, 3 has substantial benefits. **Score the costs** of each project in each category: 0 is neutral, -1 has minor costs, -2 has moderate costs, -3 has significant costs	Social - Community Accept	Social - Community Accept	Technically Feasible	Technically Feasible	Administratively Workable	Administratively Workable	Politically Acceptable	Politically Acceptable	Legally Workable	Legally Workable	Economic	Economic	Environmental Impacts	Environmental Impacts	**TOTAL - BENEFIT**	**TOTAL - COST**	**Total**
Ashland	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	
Install generator at repeater on Peppercorn Road	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-2**	**3**	**-1**	**21**	**-3**	**18**
Add more regular sized sandbags to the town's supply for flooding	**3**	**-1**	**3**	**0**	**3**	**-1**	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**-3**	**21**	**-6**	**15**
Install backup power at the police station/town office	**3**	**-2**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**-2**	**2**	**0**	**20**	**-5**	**15**
Install generator at Town Garage.	**3**	**-2**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-1**	**3**	**-2**	**2**	**0**	**20**	**-5**	**15**
Address flooding concerns on the Collins Street Bridge to mitigate flood hazard	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-2**	**3**	**-3**	**3**	**-3**	**21**	**-8**	**13**
Address Thompson Street drainage through ditching, catch basins, and increased driveway culvert sizes.	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**0**	**3**	**-2**	**3**	**-3**	**3**	**-3**	**21**	**-8**	**13**

APPENDIX J: EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

Ashland Hazard Mitigation Plan, 2006
Ashland Master Plan Update, 2012
Ashland Zoning Ordinance, 2012
Ashland Subdivision Regulations, 2008
Ashland Site Plan Regulations, 2003
Development Activity in the Lakes Region, 2011 Annual Report, Lakes Region Planning Commission.
FEMA Community Information System
Ashland Town Assessor Database, 2011
2010 Multi-Hazard Mitigation Plan, NH Homeland Security and Emergency Management
National Oceanic and Atmospheric Administration website
NH Division of Forests and Lands http://www.nhdfl.org/fire-control-and-law-enforcement/
Annual Report of the Officers and Boards of the Town of Ashland, NH, 2011

APPENDIX K: MONITOR, EVALUATE, & UPDATE

Table A: Periodic Hazard Mitigation Plan Review Record

This table can be used to keep track of the basic elements of future meetings of the Ashland Hazard Mitigation Committee.

Meeting Schedule (dates)	Tasks Accomplished	How well (or not-so-well) is implementation progressing?	Lead Parties	Public Involvement (citizens, neighboring communities)

Table B: Project Implementation Checklist

This matrix can be utilized during future meetings of the Ashland Hazard Mitigation Committee to track the progress of the various Mitigation Actions identified in this plan over the next four years. This will not only be a useful tracking tool through the life of the Plan but also a good reference when the Committee prepares to update the Plan.

Action ID	Recommended Action	Potential Funding	Lead Party	Time Frame	Status 2014	Status 2015	Status 2016	Status 2017
A	Further educate the public regarding the Hazard Mitigation Plan through town communications such as the website and town bulletin.	Operating Budget	Town Administrator, Selectmen	2013				
B	Include the Hazard Mitigation Plan in the Master Plan as outlined in RSA 674:2	Operating Budget	Town Administrator, Selectmen	2013				
C	Expand the local CERT team	Operating Budget	EMD	2013				
D	Purchase and distribute an emergency preparedness guide for all hazards.	EMD budget	EMD	2013				
E	Provide education on all hazards via the town website	Operating Budget	EMD, Town Admin.	2013				
F	Conduct engineering study of the river side of River Street.	Operating Budget	Ashland Electric Department	2013				
G	Get on the FEMA and US Army Corps of Engineers list for determining the base flood elevation on the Squam River.	Operating Budget	Town Administrator, Selectmen	2013				

Action ID	Recommended Action	Potential Funding	Lead Party	Time Frame	Status 2014	Status 2015	Status 2016	Status 2017
H	Install narrow band digital radio communications in the Ashland Elementary School.	Ashland Electric Department (noted in CIP)	EMD, Ashland Electric Department	2014				
I	Update and coordinate with the Sewer Commission regarding flood exposure at sewer lagoons from flooding and spillage on the Squam and Pemigewasset Rivers.	Operating Budget	EMD	2014				
J	Add more regular sized sandbags to the town's supply for flooding.	Operating Budget	EMD	2014				
K	Coordinate the storage and availability of Dam Emergency Action Plan files together so they can be accessed at the EOC.	Operating Budget, Grant	EMD	2014				
L	Include Hazard Mitigation Plan information in the Town Report	Operating Budget	Town Administrator, Selectmen	2014				
M	Establish secondary shelter arrangements at the American Legion building	Operating Budget	EMD	2014				
N	Upgrade Highway, Electric, and Water/Sewer departments to narrow band radios	Grant, Operating Budget	EMD	2014				

Action ID	Recommended Action	Potential Funding	Lead Party	Time Frame	Status 2014	Status 2015	Status 2016	Status 2017
O	Work with the owner of the repetitive loss property to mitigate future flood damage.	Operating Budget	EMD, Code Enforcement	2014				
P	Install generator at repeater on Peppercorn Road	Grant, Operating Budget	EMD	2015				
Q	Install backup power at the police station/town office	EMPG	Budget Comm., Town Admin., Select	2015				
R	Install generator at Town Garage.	Grant, Operating Budget	EMD	2017				
S	Address Thompson Street drainage through ditching, catch basins, and increased driveway culvert sizes.	Operating Budget, HMPG	Town Administrator, PWD	2017				
T	Coordinate with FEMA and US Army Corps of Engineers to determine the base flood elevation on the Squam River	Federal	EMD	2018				
U	Address flooding concerns on the Collins Street Bridge to mitigate flood hazard	Operating Budget, HMPG, Sewer	Town Administrator, PWD	2018				