

# TOWN OF UNITY, NEW HAMPSHIRE HAZARD MITIGATION PLAN



*Chase's Tavern – Location of the Unity, NH Town Offices*

**Prepared by the:  
Town of Unity Hazard Mitigation Committee  
&  
Upper Valley Lake Sunapee Regional Planning Commission  
2007**



## Executive Summary

The *Unity Hazard Mitigation Plan* serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Town of Unity Hazard Mitigation Committee developed the *Plan*.

The natural hazards addressed in this plan are as follows:

- Flooding
- Dam Breach and Failure
- Drought
- Wildfire
- Earthquake
- Landslide
- Tornado
- Hurricane
- Lightning
- Severe Winter Weather

The Unity Hazard Mitigation Committee, as shown in Section IV, identified “Critical Facilities” and “Facilities/Populations to Protect” as follows:

### **Critical Facilities**

- Fire Department
- Police Department/Town Office
- Highway Department
- Sullivan County Complex (Nursing Home, Sullivan County Jail, Water Treatment Plant)
- State Road Facility
- Will’s Store
- Town Hall
- Unity Elementary

### **Facilities/Populations**

- Transfer Station
- Gillman Pond Water Distribution Station
- West Unity Church
- Quaker City Meeting House
- East Unity Schoolhouse

### **Facilities/Populations to Protect**

- Residences along Cold Pond Road and Unity Stage Road
- Residences along Old Cheshire Road

The Unity Hazard Mitigation Committee, as shown in Section VI, identified existing hazard mitigation strategies as follows:

- Update Emergency Operations Plan
- Conservation Overlay District
- Fire and Police Training
- Mutual Aid
- State Guidelines for Burning
- Winter Maintenance Policy
- Zoning Ordinance
- Building Codes
- Bridge and Culvert Inspections
- Bank Stabilization along Gillman Pond Road
- Re-engineering of Culverts along the Second New Hampshire Turnpike
- Protecting Hurd Pond Road from Erosion
- Maintenance of Fire Ponds

The Unity Hazard Mitigation Committee, as shown in Sections VII & VIII, developed a prioritized implementation schedule for newly identified hazard mitigation strategies as follows:

- Education and Outreach
- Update Fire Mitigation Equipment
- Update Highway Maintenance Equipment
- Create a Capital Improvements Program
- Acquire Signage
- Replace Culverts
- Adopt a Floodplain Ordinance
- Participate in Highway Mutual Aid

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# SECTION I

## INTRODUCTION

### BACKGROUND

The New Hampshire Bureau of Emergency Management (NHBEM) has a goal for all communities within the State of New Hampshire to establish local hazard mitigation plans as a means to reduce future losses from natural or man-made hazard events before they occur. The NHBEM has provided funding to the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC), to prepare local Hazard Mitigation Plans with several of its communities. UVLSRPC began preparing a local Hazard Mitigation Plan for the Town of Unity in December 2006. The *Unity Hazard Mitigation Plan* serves as a strategic planning tool for use by the Town of Unity in its efforts to reduce future losses from natural and/or man-made hazard events before they occur.

The Unity Hazard Mitigation Committee prepared the *Unity Hazard Mitigation Plan* with the assistance and professional services of the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) under contract with the New Hampshire Bureau of Emergency Management (NHBEM) operating under the guidance of the Federal Emergency Management Agency (FEMA). After a public hearing held in the Unity Town Offices, the Unity Board of Selectmen adopted the *Plan* on \_\_\_\_.

### PURPOSE

The Unity Hazard Mitigation Plan is a planning tool for use by the Town of Unity in its efforts to reduce future losses from natural and/or man-made hazards. *This plan does not constitute a section of the Town Master Plan, nor is it adopted as part of the Zoning Ordinance.*

### HISTORY

On October 30, 2000, President Clinton signed into law the Disaster Mitigation Act of 2000 (DMA 2000). The ultimate purpose of the DMA 2000 is to:

- Establish a national disaster mitigation program that will reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from disasters, and to
- Provide a source of pre-disaster mitigation funding that will assist States and local governments in accomplishing that purpose.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section: 322 – Mitigation Planning. This places new emphasis on local mitigation planning. It requires local governments to prepare and adopt jurisdiction-

wide hazard mitigation plans as a condition to receiving Hazard Mitigation Grant Program (HMGP) project grants. *Local governments must review and if necessary, update the mitigation plan every five years to continue program eligibility. It is recommended that the project list and disaster history sections be reviewed and updated annually.*

## **Why develop a Mitigation Plan?**

The full cost of the damage resulting from the impact of natural hazards – personal suffering, loss of lives, disruption of the economy, and loss of tax base – is difficult to quantify and measure. The State of New Hampshire is vulnerable to many types of hazards, including floods, dam breaches or failures, droughts, wildfires, earthquakes, landslides, tornados and downbursts, hurricanes, lightning, and severe winter weather. All of these types of events can have significant economic and social impacts.

## **SCOPE OF THE PLAN**

The scope of the *Unity Hazard Mitigation Plan* includes the identification of natural hazards affecting the Town, as identified by the Unity Hazard Mitigation Committee. The hazards were reviewed under the following categories:

- Flooding
- Dam Breach and Failure
- Drought
- Wildfire
- Earthquake
- Landslide
- Tornado
- Hurricane
- Lightning
- Severe Winter Weather

## **METHODOLOGY**

Using the *Hazard Mitigation Planning for New Hampshire Communities* handbook, as developed by the Southwest Regional Planning Commission (SWRPC), the Unity Hazard Mitigation Committee, in conjunction with the UVLSRPC, developed the content of the *Unity Hazard Mitigation Plan* by following the ten-step process set forth in the Handbook. The Committee held a total of six posted meetings beginning on March 2, 2006 and ending on November 2, 2006. All meetings were posted at the Town Office and open to the general public.

By nature, natural hazards affect areas not defined by political boundaries. Additionally, response to these disasters often may rely on neighboring communities for assistance such as the mutual aid services. Because of this it is important to notify and work with adjacent communities. Notification of this plan and its meetings were publicly noticed and posted, although direct invitations were not made to neighboring municipalities of Acworth, Charlestown, Claremont, Goshen, Lempster, and Newport. Future iterations and updates to this



plan will incorporate invitations to those communities to comment and participate in the planning process.

Support for mitigation strategies is important in order to carry out implementation. Although this Hazard Mitigation Plan for the Town of Unity was unable to interest additional parties, every effort will be made in the future to incorporate representation in future revisions of this plan. In order to ensure in the future that opportunity to participate in the planning process is given to other interested parties, the Town will send invitations to local businesses, educational institutions and non-profit organizations. Revisions of this plan shall incorporate press releases that will notice citizens, businesses and organizations of the progress of the plan while also soliciting input that could strengthen the value of the plan. This process will enable more successful implementation actions.

Upon notification from FEMA that this plan is been conditionally approved, the Town of Unity will hold a public hearing. At this public hearing, public comment and input regarding the plan shall be taken. Once public input has been heard, the Town shall adopt the plan with any improvements or recommended changes that are appropriate.

The following hazard mitigation meetings were vital to the development of this Plan:

- November 28, 2006
- December 19, 2006
- January 9, 2007
- January 30, 2007
- March 6, 2007

To complete this plan the Unity Hazard Mitigation Committee completed the following planning steps:

**Step 1: Map the Hazards**

Committee members identified areas where damage from natural disasters had previously occurred, areas of potential damage, and man-made facilities and infrastructure that were at risk for loss of life, property damage, and other risk factors. A GIS-generated base map provided by the UVLSRPC was used in the process.

**Step 2: Determine Potential Damage**

Committee members identified facilities that were considered to be of value to the Town for emergency management purposes, for provision of utilities and services, and for historic, cultural and social value.

### **Step 3: Identify Plans/Policies Already in Place**

Using information and activities in the Handbook, the Committee and UVLSRPC staff identified existing mitigation strategies which are already implemented in the Town related to floods, dam breaches or failures, droughts, wildfires, earthquakes, landslides, tornados and downbursts, hurricanes, lightning, and severe winter weather.

### **Step 4: Identify the Gaps in Protection/Mitigation**

Existing strategies were then reviewed for coverage, effectiveness and implementation, as well as need for improvement.

### **Step 5: Determine Actions to Take**

During an open brainstorming session, the Hazard Mitigation Committee developed a list of other possible hazard mitigation actions and strategies for the Town of Unity. Ideas proposed included structural projects, emergency operations projects, planning and engineering and public education.

### **Step 6: Evaluate Feasible Options**

The Emergency Management Committee evaluated potential strategies based on eight criteria derived from the criteria listed in the evaluation chart found on page 27 of the Handbook. Each strategy was rated (good (3), average (2), or poor (1)) for its effectiveness in meeting each of the eight criteria (e.g., Does the mitigation strategy reduce disaster damage?). Strategies were ranked by overall score for preliminary prioritization then reviewed again under Step Eight.

### **Step 7: Coordinate with other Agencies/Entities**

UVLSRPC staff reviewed the Unity Master Plan. This was done in order to determine if any conflicts existed or if there were any potential areas for cooperation. NH Bureau of Emergency Management field staff were also invited to participate.

### **Step 8: Determine Priorities**

The Committee reviewed the preliminary prioritization list in order to make changes and determine a final prioritization for new hazard mitigation actions and existing protection strategy improvements identified in previous steps. UVLSRPC also presented recommendations for the Committee to review and prioritize.

### **Step 9: Develop Implementation Strategy**

Using the chart provided under Step Nine of the Handbook, the Committee created an implementation strategy which included person(s) responsible for implementation (who), a schedule for completion (when), and a funding source and/or technical assistance source (how) for each of the identified hazard mitigation actions.

### **Step 10: Adopt and Monitor the Plan**

UVLSRPC Staff compiled the results of steps one through nine in a draft document, as well as helpful and informative materials from the State of New Hampshire Natural Hazard Mitigation Plan, which served as a resource for the Unity Hazard Mitigation Plan.

## **HAZARD MITIGATION GOALS**

The Town of Unity Hazard Mitigation Committee reviewed the hazard mitigation goals for the State of New Hampshire, and revised them for Unity.

They are as follows:

1. To protect the general population, the citizens of the town and guests, from all natural and man-made hazards.
2. To reduce the potential impact of natural and man-made disasters on the town's critical support services, critical facilities, and infrastructure.
3. To reduce the potential impact of natural and man-made disasters on the town's economy.
4. To reduce the potential impact of natural and man-made disasters on the town's natural environment, especially the water bodies.
5. To reduce the potential impact of natural and man-made disasters on the town's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the town.
6. To identify, introduce and implement cost effective hazard mitigation measures so as to accomplish the town's goals and to raise the awareness and acceptance of hazard mitigation.

## **ACKNOWLEDGEMENTS**

The following people participated in the development of this plan:

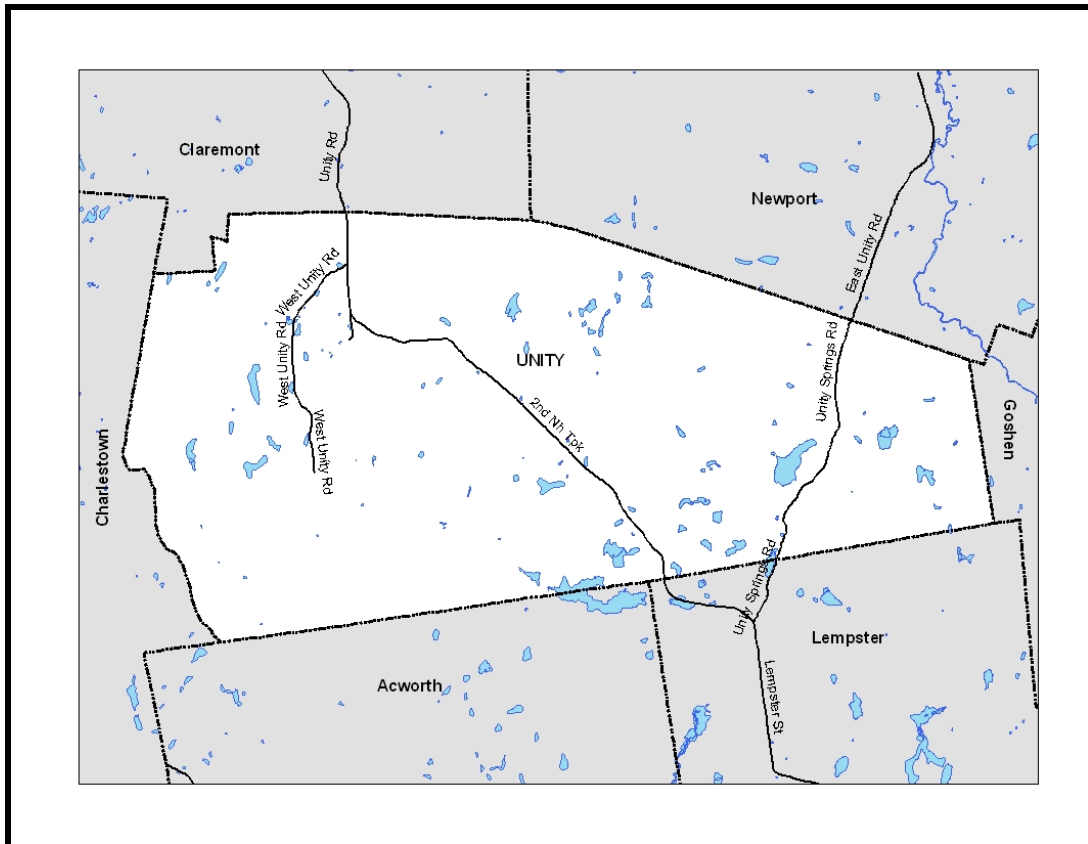
- Jason Lamere, Board of Selectmen & Emergency Management Director
- Lyle Guynup, Building Inspector & Health Officer
- Susan Lawrence, Planning Board
- Rhoda Staff, Secretary to the Planning Board
- Denis O’Sullivan, Sergeant, Sullivan County
- Bruce E. Barber, Fire Chief
- Harold Booth, Highway Foreman
- Robin Booth, Planning Board
- Courtney Daniell, UVLSRPC

## SECTION II

# COMMUNITY PROFILE

### INTRODUCTION

The Town of Unity, NH is located in the southwestern corner of the State in Sullivan County. Unity is bordered by Claremont and Newport to the north, Goshen to the east, Acworth and Lempster to the south and Charlestown to the west.



*Figure 1: Locus Map of Unity*

### Land Use and Development

The Town of Unity Master Plan Current Land Use Chapter (pp. 25-33) describes the following with respect to land use and development:

- The Planning Board recognizes the developmental limits on wetlands, steep slopes and floodplains,
- Undeveloped Resources: About 96.4 percent of Unity's land area is undeveloped. The Town also has approximately 140 acres of surface water (lakes and ponds), which

represent 0.6 percent of Unity’s total area. The large amount of undeveloped land in Unity is a reflection of the limited demand for development, large land holdings in single ownership, limited road access, and the natural characteristics of the land – varying soils and slopes, wetlands, ledge, etc. – which make development difficult and expensive.

*It is stated that proper use of these undeveloped resources is a major objective of the Master Plan.*

### DEVELOPMENT TRENDS

“Unity’s year round population is projected to increase to 1,836 by the year 2015, according to the New Hampshire Office of (Energy and) Planning. This would result in a year-round population increase of 397 above (OEP’s) 1995 population estimate of 1,439. Assuming continuation of the 1990 figure of 3.2 persons per household, an additional 124 year-round dwelling units will be needed by 2015 to accommodate the projected growth in population. Assuming continuation of the one-half acre of disturbed or developed area for each residential unit... an additional 62 acres will be converted to residential use by the year 2015.”<sup>1</sup>

#### Population Growth Comparisons: Unity and Neighboring Communities

Area	1970	1980	Avg. Annual Rate of Growth 70-80	1990	Avg. Annual Rate of Growth 80-90	2000	Avg. Annual Rate of Growth 90-00	30 Yr. Avg. Annual Rate
<b>Unity</b>	<b>709</b>	<b>1,092</b>	<b>4.4</b>	<b>1,341</b>	<b>2.1</b>	<b>1,530</b>	<b>1.3</b>	<b>2.6</b>
Claremont	14,221	14,557	0.2	13,902	-0.5	13,151	-0.6	-0.3
Charlestown	3,274	4,417	3.0	4,630	0.5	4,749	0.3	1.2
Newport	5,899	6,229	0.5	6,110	-0.2	6,269	0.3	0.2
Acworth	459	590	2.5	776	2.8	836	0.7	2.0
Sullivan County	30,949	36,063	1.5	38,592	0.7	40,458	0.5	0.9
New Hampshire	737,681	920,610	2.2	1,109,252	1.9	1,235,786	1.1	1.7

*Source: U.S. Census Bureau, 1970-2000 Census*

<sup>1</sup> Town of Unity Master Plan, p. 33

## **SECTION III**

### **HAZARD IDENTIFICATION**

The Unity Hazard Mitigation Committee reviewed the list of hazards provided in the State of New Hampshire Hazard Mitigation Plan concentrating on past hazards occurring in Sullivan County. For each hazard, a listing of the location, extent, previous occurrences, potential future events, and probability of future events was created and can be found starting on page 9. After compiling the list of past and potential hazards the Committee conducted a Risk and Vulnerability Assessment, located on page 16.

Determination of the extent of a given hazard within the Town of Unity was based on regional risk and the severity of past occurrences. Each hazard was assigned a descriptor for the worst damage likely to be caused by a hazard event, according to the following key:

- Minimal: Limited and scattered property damage; no damage to public infrastructure (roads, bridges, trains, airports, public parks, etc.); contained geographic area (i.e., 1 or 2 communities); essential services (utilities, hospitals, schools, etc.) not interrupted; no injuries or fatalities.
- Moderate: Scattered major property damage (more than 50% destroyed); some minor infrastructure damage; wider geographic area (several communities) essential services are briefly interrupted; some injuries and/or fatalities.
- Severe: Consistent major property damage; major damage to public infrastructure (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and fatalities.
- Catastrophic: Property and public infrastructure destroyed; essential services stopped, thousands of injuries and fatalities.

Determination of the probability of future events for each hazard was completed by the Unity Hazard Mitigation Committee. Committee members assigned probability of occurrence values to each hazard type based on the committee's knowledge of past occurrences. The ratings were based on the probability that the occurrence may happen within the next ten years (Likely), between 10-25 years (Possible), or after 25 years (Not Likely). An n/a rating was given if there was insufficient evidence to make a decision.

### **WHAT ARE THE HAZARDS?**

Unity is prone to a variety of natural hazards. These include: floods, dam breaches or failures, droughts, wildfires, earthquakes, landslides, tornados and downbursts, hurricanes, lightning, and severe winter storms.

Radon and avalanche hazards were included in the State Hazard Plan, but the Unity Hazard Mitigation Committee did not identify that these hazards have occurred in the past or have the potential to occur in the Town of Unity. According to a map included in the State Hazard Plan, the Town of Unity had generally low radon concentrations; less than 25% of homes tested by the

Bureau of Radiological Health had radon concentrations equal to or greater than the EPA's "action level" of 4 picocuries per liter. Avalanches are snowslides that are likely to occur in mountainous regions with large snowfall, such as the White Mountain region of New Hampshire, and not likely to ever occur in the Town of Unity.

## **PROFILE OF NATURAL HAZARDS**

### **Flooding**

#### *Overview*

Flooding is the temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination, and can disrupt travel routes on roads and bridges.

Floods in the Unity area are most likely to occur in the spring due to the increase in rainfall and snowmelt; however, floods can occur at any time of the year. A sudden winter thaw or a major summer downpour can cause flooding.

#### *100-Year Floods*

The term "100-year flood" does not mean that flooding will occur once every 100 years, but is a statement of probability to describe how one flood compares to others that are likely to occur. What it actually means is that there is a one percent chance of a flood in any given year.

#### *River Ice Jams*

"Ice forming in riverbeds and against structures presents significant hazardous conditions [...] ... storm waters encounter these ice formations which may create temporary dams. These dams may create flooding conditions where none previously existed (i.e., as a consequence of elevation in relation to normal floodplains). Additionally, there is the impact of the ice itself on structures such as highway and railroad bridges. Large masses of ice may push on structures laterally and/or may lift structures not designed for such impacts" (This and all subsequent cited statements in this section are from NH State Hazard Mitigation Plan, page 16).

#### *Rapid Snow Pack Melt*

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

#### *Location*

Floods are likely to occur on areas of land adjacent to lakes and streams. Roads that cross streams or lie next to streams are at risk of flood damage. In the Town of Unity, almost all roads cross or are adjacent to streams and many streams and small ponds dissect the landscape. Large flooding events have affected the entire town, thus the entire town is at risk for floods.

#### *Extent*

In the town of Unity, FEMA's Digital Flood Insurance Rate Maps indicate that the area surrounding several waterbodies lie within the 100-year floodplain (map included in Appendix F). Flooding is not limited to this area, as the Unity Hazard Mitigation Committee identified multiple roads that have been flooded that do not lie within the 100-year floodplain. Large



flooding events have affected the entire town, thus the entire town is at risk for floods. The worst damage that flooding is likely to cause in the Town of Unity is severe, based on the past occurrences of damage to the road network (see page 9 for key to determining extent description).

*Previous Occurrences*

Floods occur on an annual basis, most often in the spring. Fourteen large flooding events have been recorded since 1927 that affected the Town of Unity. Many of these affected large regions or the entirety of the state, and some were more localized to Unity.

A search on the Cold Regions Research and Environmental Laboratory (CRREL) and discussion with the Unity Hazard Mitigation Committee revealed no history of ice jam-related events in the Town of Unity.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Description of Areas Impacted</b>
Flood	November 3-4, 1927	Southern NH	Damage to Road Network. Caused many roads to wash out.
Flood	March 11-21, 1936	NH State	Damage to Road Network. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather. Run-off from melting snow with rain overflowed the rivers
Flood	Spring 1974	Town of Unity City of Claremont (along road near town line)	Floodwaters from Quabinight Brook filled homes to the middle of the first floor along the 2 <sup>nd</sup> New Hampshire Turnpike.
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	FEMA Disaster Declaration # 876. Flooding caused by a series of storm events with moderate to heavy rains. \$2,297,777 in damage.
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties, NH	FEMA Disaster Declaration # 1144- DR. Flooding caused by heavy rains. \$2,341,273 in damage.
Flood	July 2, 1998	Southern NH	FEMA Disaster Declaration # 1231. Severe storms and flooding
Flood	October 8, 2005	Town of Unity – Stage Road, Unity Springs Road, Old Cheshire County Road	Damage to Road Network. Stranded 4 houses on Old Cheshire County Road
Flood	October 7-18, 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding.
Flood	October-November 2005	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan counties	FEMA Disaster Declaration # DR-1144-NH
Flood	May 25th, 2006	Belknap, Carroll, Hillsborough, Merrimack, Rockingham, and Strafford Counties, NH	FEMA Disaster Declaration # 1643. Severe storms and flooding.
Flood	July 2006	Town of Unity	Damage to Road Network. Roads affected were Hurd Pond Road, Coon Brook Road, Skyline Road, Center Road, Gillman Pond Road, North Koski Road, and South Koski Road. One residence affected.

Flood	July 23, 2006	Town of Unity	Damage to Road Network. Roads affected were Unity Springs Road and Old Cheshire County Road. 4 houses stranded at the end of Old Cheshire County Road.
Flood	April 16, 2007	All counties, NH	FEMA Disaster Declaration # 1695. Severe storms and flooding.
Flood	Unknown	Town of Unity	The committee recalled a flooding event along Copeland Brook Road, in which two culverts were washed out.

*Probability of Future Events*

Unity Hazard Mitigation Committee members noted the following flood-prone areas in the Town of Unity:

- Second New Hampshire Turnpike
- Copeland Brook Road
- Unity Springs Road
- Old Cheshire County Road
- Stage Road, including 8 residences along the Little Sugar River that could potentially be affected in the future.
- Hurd Pond Road
- Coon Brook Road
- Skyline Road
- Center Road
- Gillman Pond Road
- North Koski Road
- South Koski Road.

In addition, The Town of Unity could potentially lose Stage Road and Dunham Road to flooding due to the loss of the Twin Bridges arch culvert. Currently, there is just empty space under the road. Plans for a new bridge are underway.

According to the State of NH’s 2004 Statewide Mitigation Plan, Sullivan County has a high risk of flooding. The Unity Hazard Mitigation Committee determined that the probability of future flooding events in the Town is likely, or probable to occur within the next ten years.

**Dam Breach or Failure**

*Overview*

Dam failure or breach results in rapid loss of water that is normally held by the dam. The resultant flooding may pose a significant threat to both life and property.

*Location*

Twenty-seven dams are located within the Town of Unity. Areas downstream of these dams are at risk of flooding due to dam breach or failure.

*Extent*

The worst damage dam breach or failure is likely to cause depends on the size and location of the dam in question. The New Hampshire Department of Environmental Services Water Division classifies dams into the following four categories, based on the potential damage that a dam failure would likely cause:

- Non-Menace (NM),
- Low Hazard (L),
- Significant Hazard (S), and
- High Hazard (H).

In the Town of Unity, five dams are classified as low hazard. No other dams are sizable enough to be of concern. Dams with a low hazard classification are of a size and in a location where dam failure would result in any of the following:

- “No possible loss of life.
- Low economic loss to structures and property.
- Structural damage to a town 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.”

The worst damage that dam breach or failure of one of the low hazard dams is likely to cause is moderate. The worst damage that dam breach or failure of one of the non-menace dams is likely to cause is minimal (see page 9 for key to determining extent description).

The table below shows all dams in the Town of Unity; those without a hazard classification are non-active.

Dam #	Class	Dam Name	Owner	Status	Type	Height (ft)	IMPND (Acres)
240.01	L	GILMAN POND DAM MCDEVITT FARM	TOWN OF NEWPORT	ACTIVE	CONCRETE	6.00	62.000
240.19	L	POND DAM	MR ROBERT MCDEVITT	ACTIVE	EARTH	17.00	0.350
240.17	L	SPOONER POND DAM OBERKOTTER REC	MAYLAND P OSGOOD	ACTIVE	EARTH	11.00	0.600
240.27	L	POND DAM SULLIVAN COUNTY	MRS ROBERT OBERKOTTER	ACTIVE	EARTH	10.00	0.830
240.26	L	HOME FIRE POND AGEL FARM POND	SULLIVAN COUNTY FARM	ACTIVE	EARTH	8.00	0.750
240.10	NM	DAM CONSERVATION	MR STEPHEN AGEL	ACTIVE	EARTH	4.00	0.300
240.13	NM	POND DAM MARSHALL POND	MR HAROLD HALL JR SULLIVAN COUNTY	ACTIVE	EARTH	3.00	0.000
240.02	NM	DAM	NURSING HOME SULLIVAN COUNTY	ACTIVE	CONCRETE	7.50	13.000
240.07	NM	WILDLIFE POND DAM OLD RESERVOIR	NURSING HOME SULLIVAN COUNTY	ACTIVE	EARTH	10.00	0.930
240.03	NM	DAM	NURSING HOME	ACTIVE	CONCRETE	12.00	0.500
240.14	NM	WILDLIFE POND DAM	MR NORWOOD KEENEY	ACTIVE	EARTH	8.00	0.300

240.09	NM	COX FARM POND DAM	MR WILBUR COX	ACTIVE	EARTH	10.00	0.320
240.18	NM	FIRE POND	MR MICHAEL DOMBROSKI	ACTIVE	CONCRETE	5.00	2.000
240.11	NM	FARM POND DAM	UNKNOWN	ACTIVE	EARTH	6.00	0.300
240.23	NM	HILL DAM	HARVEY HILL CPM INC	ACTIVE	EARTH	22.00	0.500
240.22	NM	CONDON POND DAM	MR DAVID CONDON	ACTIVE	EARTH	8.00	0.250
240.08	NM	TOPKINS FARM POND DAM	MR PETER TOMPKINS	ACTIVE	EARTH	6.00	0.500
240.20	NM	FUSSCAS DAM 1	KEN ROCKWELL NE FOREST MANAG	ACTIVE	CONCRETE	3.00	1.000
240.05	NM	FIRE POND DAM	MRS FRANCES ZUBRYD	ACTIVE	-	14.00	0.270
240.24	NM	LEVANOVICH POND DAM	MR SCOTT LEVANOVICH	ACTIVE	EARTH	10.00	0.130
240.25	NM	PERRON RECREATION POND DAM	MR IVAN PERRON	ACTIVE	EARTH	10.00	0.220
240.06	-	FARM POND DAM	MR RICHARD LORD	NOT BUILT	-	13.00	0.000
240.12	-	FARM POND DAM	MR LEOPOLD RENZ	EXEMPT	EARTH	0.00	0.250
240.04	-	NAMELESS BROOK DAM	MR ROYCE C SHUTE	NOT BUILT	CONCRETE	7.00	0.000
240.21	-	FUSSCAS DAM 2	KEN ROCKWELL NE FOREST MANAG	EXEMPT	CONCRETE	3.00	0.500
240.16	-	MICHARD FARM POND DAM	MR RAY MICHARD	NOT BUILT	EARTH	0.00	0.000
240.15	-	FIRE POND DAM	MR DONALD SWINYER	NOT BUILT	-	0.00	0.000

**SOURCE: DAM INFORMATION PROVIDED BY THE NH DAM BUREAU IN 2007 AND WILL BE VERIFIED BY TOWN OFFICIALS.**

### *Previous Occurrences*

Committee members could not recall any instances of dam breach or failure within the Town of Unity.

### *Probability of Future Events*

There is potential for dam breach or failure, although the dams within Unity are not categorized as significant hazards. Committee members identified the potential for dam breach or failure at the Coon Brook Road Dam in Unity, NH. All structures along into Coon Brook Road into Newport would be affected in a hazard event. There are 8 residences that would be stranded in the event of a loss of Coon Brook Road.

The State Hazard Plan list Sullivan County as an area of low risk for dam failure. The Unity Hazard Mitigation Committee determined that they did not have enough information to assign a value to the probability of future dam failure events in the Town.

## **Drought**

### *Overview*

A drought is a natural hazard that is difficult to define. During a drought, precipitation is abnormally low; this pattern of dry conditions can last for a few months to several years. The severity of a drought evolves over time and can be described by the amount of water deficit, the duration, and the size of the affected area. The effects of drought are indicated through measurements of soil moisture, groundwater levels and stream flow. Low stream flow and low ground water levels commonly cause diminished water supply.

*Location*

Drought in New Hampshire has a widespread geographic extent, and affects the entire Town of Unity when it occurs.

*Extent*

The worst damage drought is likely to cause is moderate, due to the potential interruption of water supply for extended periods of time (see page 9 for key to determining extent description). In addition, drought increases the risk of wildfire.

*Previous Occurrences*

Droughts in New Hampshire appear to follow a 10 or 25 year interval; the last major drought in New Hampshire was in 2001-2002. In the past century, five major droughts were recorded.

The Unity Hazard Mitigation Committee could not recall any major periods of drought in Unity.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Description of Areas Impacted</b>
Drought	1929-1936	Statewide	Regional. Recurrence Interval 10 to > 25 years
Drought	1939-1944	Statewide	Severe in southeast and moderate elsewhere. Recurrence Interval 10 to > 25 years
Drought	1947-1950	Statewide	Moderate. Recurrence Interval 10 to > 25 years
Drought	1960-1969	Statewide	Regional longest recorded continuous spell of less than normal precipitation. Encompassed most of the Northeastern US. Recurrence Interval > 25 years
Drought	2001-2002	Statewide	Third worst drought on record, exceeded only by the drought of 1965-1966 and 1941-1942.

*Probability of Future Events*

According to the State Hazard Plan, Sullivan County has a medium risk of drought with recurrence intervals between 10 and 25 years. The Unity Hazard Mitigation Committee determined that the probability of future drought events in the Town is unlikely, or not probable to occur within the next 25 years.

## **Wildfire**

### *Overview*

Wildfire is defined as any unwanted and unplanned fire burning in the forest, shrub or grass. Wildfires are frequently referred to as forest fires, shrub fires or grass fires, depending on their location. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. The threat of wildfires is greatest where vegetation patterns have been altered by past unsafe land-use practices, fire suppression and fire exclusion. Vegetation buildup can lead to more severe wildfires.

Increased severity over recent years has decreased capability to extinguish wildfires. Wildfires are unpredictable and usually destructive, causing both personal property damage and damage to community infrastructure, cultural and economic resources. Negative short term effects of wildfires include destruction of timber, forage, wildlife habitats, scenic vistas and watersheds. Some long term effects include erosion and poor water quality.

Since 1985, approximately 9,000 homes have been lost to urban/wild land interface fires across the United States (Northeast States Emergency Consortium: [www.nesec.org](http://www.nesec.org)). The majority of wildfires usually occur in April and May, when home owners are cleaning up from the winter months, and when the majority of vegetation is void of any appreciable moisture making them highly flammable. As weather and human activities change with the seasons of the year, so does the incidence, causes and severity of fires. Cold winter weather increases indoor activities and the need for heating, which brings about the peak period of heating structure fires. Daily fire incidence is at its highest in the spring. Spring is characterized by an increase in outside fires and a decrease in fires related to heating. The increase in outside spring fires is in large part due to the increase in tree, grass, and brush fires. Summer fires reflect an increase of incendiary and suspicious fires, fires associated with fireworks and natural fires caused by lightning strikes. These fires are a reflection of the change to warmer weather and the consequent increase in both outside activities and dry natural vegetation. Fire incidence is at its lowest in the fall. In fall, there is a decrease in outside fires, an increase in heating-related structure fires and the peak period of cooking fires.

### *Location*

Forested, high elevation areas in Unity are particularly vulnerable to wildfire events. Present concerns of New Hampshire Department of Resources and Economic Development, Division of Forests & Lands are that the Ice Storm of 1998 has left a significant amount of woody debris in the forests of the region as may fuel future wildfires.”<sup>2</sup>

### *Extent*

“New Hampshire averages 500 fires per year and averages ½ acre or less per fire due to the excellent coordination between Fire Towers and local Fire Departments.”<sup>3</sup> The worst damage wildfire is likely to cause is limited, due to the small size of most wildfires (see page 9 for key to determining extent description)

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2 State of NH Hazard Mitigation Plan, p. 34

3 Ibid. p. 34

*Previous Occurrences*

The Unity Hazard Mitigation Committee recalled one recent wildfire: in May of 1999, there was a 4 – 5 acre wildfire in the North Shore Road area. “Historically, large New Hampshire wildland fires run in roughly 50 year cycles. Prolonged drought increases the likelihood of such events

*Probability of Future Events*

Historically, large New Hampshire wildland fires have run in roughly 50 year cycles. Prolonged drought increases the likelihood of such events; severe droughts in New Hampshire appear to follow a 10 to 25 year interval. Changing patterns of settlement and land use affect fire regimes and vulnerability of structures and forests to fire. The attached map of the wildland-urban interface provides an overview of the large amount of wildland-urban intermix and interface area that is vulnerable to wildfire.

Sullivan County has a high risk of wildfire, as identified in the State Hazard Plan. The Unity Hazard Mitigation Committee determined that the probability of future wildfire events in the Town is possible, or probable to occur within the next ten to 25 years.

**Earthquake**

*Overview*

An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth’s surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and cause landslides, flash floods and fires. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and the Mercalli scale.

*Location*

New England is considered a moderate risk earthquake zone. Four earthquakes occurred in New Hampshire between 1924-1989 had a magnitude of 4.2 or more. Two of these had their epicenters in Ossipee, one west of Laconia, and one near the Quebec border, and the tremors were felt throughout the State of New Hampshire. An earthquake would affect the entire Town of Unity.

*Extent*

The worst damage earthquake is likely to cause is limited, due to the minor damage sustained in past earthquakes (see page 9 for key to determining extent description).

*Previous Occurrences*

There are no records of an earthquake centered within the Town of Unity or Sullivan County. Several earthquakes have occurred in the Northeast region, the tremors of which were felt throughout New Hampshire.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Description of Areas Impacted</b>
Earthquake	1638	Central New Hampshire	6.5-7
Earthquake	October 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine

Earthquake	December 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	November 18, 1755	Cape Ann, MA	6.0, much damage
Earthquake	1800s	Statewide New Hampshire	83 felt earthquakes in New Hampshire
Earthquake	1900s	Statewide New Hampshire	200 felt earthquakes in New Hampshire
Earthquake	March 18, 1926	Manchester, NH	Felt in Hillsborough County
Earthquake	December 20, 1940	Ossipee, NH	Both earthquakes of magnitude 5.5, both felt for 400,000 sq miles, structural damage to homes, damage in Boston MA, water main rupture.
Earthquake	December 28, 1947	Dover-Foxcroft, ME	4.5
Earthquake	June 10, 1951	Kingston, RI	4.6
Earthquake	April 26, 1957	Portland, ME	4.7
Earthquake	April 10, 1962	Middlebury, VT	4.2
Earthquake	June 15, 1973	Near NH Quebec Border, NH	4.8
Earthquake	January 19, 1982	Gaza (west of Laconia), NH	4.5, walls and chimneys cracked, damage up to 15 miles away in Concord
Earthquake	October 20, 1988	Near Berlin, NH	4

*Probability of Future Events*

New Hampshire lies in a zone of moderate seismic vulnerability. Sullivan County has a medium risk of earthquakes, as identified in the State Hazard Plan. The Unity Hazard Mitigation Committee determined that they did not have enough information to assign a value to the probability of future earthquake events in the Town.

**Landslide**

*Overview*

A landslide is the downward or outward movement of slope-forming materials reacting under the force of gravity, including mudslides, debris flows, and rockslides. Formations of sedimentary deposits along the Connecticut River also create potential landslide conditions. Landslides can damage or destroy roads, railroads, electrical and phone lines, and other structures.

*Location*

Unity has many streams and hilly terrain; the area potentially at risk for landslides is widespread throughout the Town.



*Extent*

The worst damage landslide is likely to cause is limited, due to the minor damage sustained in past landslides (see page 9 for key to determining extent description).

*Previous Occurrences*

The Committee identified the following concerning landslide and erosion:

- On October 8, 2005, 200' of shoulder was lost along Cold Pond Road.
- There is the potential for bank stabilization along Copeland Brook Road and Cold Pond Road due to erosion caused by the Little Sugar River.

*Probability of Future Events*

Sullivan County has a medium risk of landslides, as identified in the State Hazard Plan. The Unity Hazard Mitigation Committee determined that the probability of future landslide events in the Town is unlikely, or not probable to occur within the next 25 years.

**Tornado and Downburst**

*Overview*

“A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. These events are spawned by thunderstorms and, occasionally by hurricanes, and may occur singularly or in multiples. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. Most vortices remain suspended in the atmosphere. Should they touch down, they become a force of destruction.” (NH Hazard Mitigation Plan). The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. Most tornadoes are in the F0 to F2 Class. Building to modern wind standards provides significant property protection from these hazard events. New Hampshire is located within Zone 2 for Design Wind Speed for Community Shelters, which suggests that buildings should be built to withstand 160 mph winds.

*Downbursts*

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

*Location*

All areas of Unity are potentially at risk for property damage and loss of life due to tornados.

*Extent*

The worst damage that a tornado is likely to cause is severe, due to the likelihood of damage to property and infrastructure and the interruption of essential services (see page 9 for key to determining extent description).

*Previous Occurrences*

The National Climatic Data Center lists five tornado events in Sullivan County between the years 1950 and March 2007. The Unity Hazard Mitigation Committee could not recall any specific tornado events within the Town.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Fujita Scale</b>	<b>Property Damage</b>
Tornado	October 24, 1955	Sullivan County	F0 scale	\$25,000
Tornado	July 9, 1962	Sullivan County	F0 scale	\$25,000
Tornado	July 9, 1962	Sullivan County	F2 scale	\$3,000
Tornado	July 18, 1963	Sullivan County	F1 scale	\$25,000
Tornado	August 13, 1999	East Plainfield, Sullivan County	F1 scale	\$100,000

The Committee recalled a strong downburst, characterized by a strong straight line wind, in the summer of 1995. The wind came from the west and all hillsides with western exposure were affected. The Committee identified Britton Hill and Straw Hill as areas that were without electrical power due to this hazard event.

*Probability of Future Events*

The State Hazard Plan list Sullivan County as an area of medium risk for tornados and downbursts. The Unity Hazard Mitigation Committee determined that the probability of future tornado events in the Town is possible, or probable to occur in the next 10 to 25 years.

**Hurricane**

*Overview*

A hurricane is an intense tropical weather system with a well-defined circulation and maximum sustained winds of 74 mph (64 knots) or higher. Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye" is generally 20 to 30 miles wide, and the storm may extend outward 400 miles. As a hurricane nears land, it can bring torrential rains, high winds, and storm surges. A single hurricane can last for more than 2 weeks over open waters and can run a path across the entire length of the eastern seaboard. August and September are peak months during the hurricane season that lasts from June 1 through November 30. Damage resulting from winds of this force can be substantial, especially considering the duration of the event, which may last for many hours (NH Hazard Mitigation Plan; FEMA website).

*Location*

The location of a hurricane is large in nature and when occurring in Unity affects the entire town.

*Extent*

The worst damage that a hurricane is likely to cause is severe, as flooding and high winds may cause major damage to public infrastructure and the disruption of essential services (see page 9 for key to determining extent description).

*Previous Occurrences*

Since 1635, fifteen hurricanes, tropical storms, or gales have reached New Hampshire.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Description of Areas Impacted</b>
Hurricane	August, 1635	n/a	
Hurricane	October 18-19, 1778	n/a	Winds 40-75 mph
Hurricane	October 9, 1804	n/a	
Gale	September 23, 1815	n/a	Winds > 50mph
Hurricane	September 8, 1869	n/a	
Hurricane	September 21, 1938	Southern New England	Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total storm losses of \$12,337,643 (1938 dollars). 186 mph maximum winds.
Hurricane (Carol)	August 31, 1954	Southern New England	Category 3, winds 111-130 mph. Extensive tree and crop damage in NH, localized flooding
Hurricane (Edna)	September 11, 1954	Southern New England	Category 3 in Massachusetts. This Hurricane moved off shore but still cost 21 lives and \$40.5 million in damages throughout New England. Following so close to Carol it made recovery difficult for some areas. Heavy rain in NH
Hurricane (Donna)	September 12, 1960	Southern and Central NH	Category 3 (Category 1 in NH). Heavy flooding in some parts of the State.
Tropical Storm (Doria)	August 28, 1971	New Hampshire	Center passed over NH resulting in heavy rain and damaging winds
Hurricane (Belle)	August 10, 1976	Southern New England	Primarily rain with resulting flooding in New Hampshire. Category 1
Hurricane (Gloria)	September, 1985	Southern New England	Category 2, winds 96-110 mph. Electric structures damaged; tree damages. This Hurricane fell apart upon striking Long Island with heavy rains, localized flooding, and minor wind damage in NH
Hurricane (Bob)	August 19, 1991	Southern New England	Structural and electrical damage in region from fallen trees. 3 persons were killed and \$2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR
Hurricane (Edouard)	September 1, 1996	Southern New England	Winds in NH up to 38 mph and 1 inch of rain along the coast. Roads and electrical lines damaged
Tropical Storm (Floyd)	September 16-18, 1999	Southern New England	FEMA DR-1305-NH. Heavy Rains

*Probability of Future Events*

Hurricanes in Unity are more likely to cause flooding from associated rain than disturbance and destruction from high winds, although the region has seen remnants from many hurricanes from the coast over the past 100 years. The extent of hurricanes in Unity would most likely not be geographically bound and would affect the entire community.

The State Hazard Plan lists Sullivan County as a medium risk for future hurricanes based on past evidence. The Unity Hazard Mitigation Committee determined that the probability of future tornado events in the Town is possible, or probable to occur in the next 10 to 25 years.

**Lightning**

*Overview*

“Lightning is a giant spark of electricity that occurs between the positive and negative charges within the atmosphere or between the atmosphere and the ground. In the initial stages of development, air acts as an insulator between the positive and negative charges. However, when the potential between the positive and negative charges becomes too great, there is a discharge of electricity that we know as lightning.”

*Location*

All areas of Unity are at risk for property damage and loss of life due to lightning.

*Extent*

The worst damage lightning is likely to cause is minimal, due to limited property damage and contained geographic area inherent in the nature of a lightning strike. There is potential for interruption of essential services if communications equipment or infrastructure is damaged (see page 9 for key to determining extent description).

*Previous Occurrences*

“Lightning kills an average of 87 people per year in the United States, and New Hampshire has the 16th highest casualty rate in the nation.”<sup>4</sup> In Sullivan County, five lightning strikes have been reported from 1950 and 2007 to the National Climatic Data Center, including two lightning strikes that damaged equipment in town-owned buildings. The Unity Hazard Mitigation Committee did not note any lightning strikes within the Town.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Description of Areas Impacted</b>	<b>Hazard</b>
Lightning	July 21, 1994	Sullivan County	1 person injured	--
Lightning	May 31, 2002	Town of Sunapee	Storage barns struck & destroyed	\$20,000
Lightning	June 5, 2002	Town of Washington	Tower of Town Hall struck; damage to tower and equipment	\$11,000
Lightning	August 18, 2002	Town of Sunapee	Three people injured	--
Lightning	July 8, 2004	Town of Sunapee	Computer and radio equipment damaged at Town Office	\$3,000

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4 State of NH Hazard Mitigation Plan, page 63

### *Probability of Future Events*

Sullivan County has a medium risk of lightning strikes, according to the State Hazard Plan. The Unity Hazard Mitigation Committee determined that they did not have enough information to assign a value to the probability of future earthquake events in the Town.

## **Severe Winter Weather Storms**

### *Overview*

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

### *Heavy Snow Storms*

“A heavy snowstorm is generally considered to be one which deposits four or more inches of snow in a twelve-hour period... A blizzard is a winter storm characterized by high winds, low temperatures, and driving snow- according to the official definition given in 1958 by the U.S. Weather Bureau, the winds must exceed 35 miles per hour and the temperatures must drop to 20°F (-7°C) or lower. Therefore, intense Nor’easters, which occur in the winter months, are often referred to as blizzards. The definition includes the conditions under which dry snow, which has previously fallen, is whipped into the air and creates a diminution of visual range. Such conditions, when extreme enough, are called ‘white outs’.”

### *Ice Storms*

“When a mass of warm moist air collides with a mass of cold arctic air, the less dense warm air will rise and the moisture may precipitate out in the form of rain. When this rain falls through the colder more dense air and comes in contact with cold surfaces, the latent heat of fusion is removed by connective and/or evaporative cooling. Ice forms on these cold surfaces and may continue to form until the ice is quite deep, as much as several inches. This condition may strain branches of trees, power lines and even transmission towers to the breaking point and often creates treacherous conditions for highway travel and aviation. Debris impacted roads make emergency access, repair and cleanup extremely difficult.

### *“Nor’easters”*

In the winter months, [Towns within] the State may experience the additional coincidence of blizzard conditions with many of these events as well as the added impact of the masses of snow and/or ice upon infrastructure thus, impacting upon transportation and the delivery of goods and services for extended periods of time, as well as various related impacts upon the economy. The entire area of the State may be impacted by these events... Heavy snow and/or rainfall may be experienced in different areas of the State and the heavy rains may contribute to flood conditions. Nor’easter events which occur toward the end of a winter season may exacerbate the spring flooding conditions by depositing significant snow pack at a time of the season when spring rains are poised to initiate rapid snow pack melting.”

*Location*

Severe winter storms are regional in nature, and when occurring in Unity affect the entire town.

*Extent*

The worst damage that a severe winter storm is likely to cause is severe, due to the interruption of essential services and damage to property sustained during this type of event (see page 9 for key to determining extent description).

*Previous Occurrences*

Some damage from severe winter storms is recorded on an annual basis. The table below highlights the most severe winter storms with regional or statewide impact since 1929 as well as severe winter storms with local impact. The Unity Hazard Mitigation Committee recalled three severe winter storm events within the past three decades that caused severe damage. In 1978, drifting snow from a large storm created hazardous conditions; in the 1998 ice storm, a total of 83 buildings were damaged; and in 2001, multiple buildings collapsed under the weight of the 58 inches of snow that fell during the month of February.

The Committee recorded that the ice storm of 1998 affected higher elevations in the Town. Areas that were most affected include: Straw Hill with 21 structures, Britton Hill with 37 structures, and the North Shore with 15 structures.

<b>Hazard</b>	<b>Date</b>	<b>Location</b>	<b>Description of Areas Impacted</b>
Ice Storm	December 17-20, 1929	New Hampshire	Unprecedented disruption and damage to telephone telegraph and power system. Comparable to 1998 Ice Storm (see below)
Ice Storm	Dec. 29-30, 1942	NH	Glaze storm; severe intensity
Snow Storm	December 10-13, 1960	New Hampshire	Up to 17 inches of snow in southern NH
Snow Storm	January 18-20, 1961	New Hampshire	Up to 25 inches of snow in southern NH
Snow Storm	February 2-5, 1961	New Hampshire	Up to 18 inches of snow in southern NH
Snow Storm	January 11-16, 1964	New Hampshire	Up to 12 inches of snow in southern NH
Blizzard	January 29-31, 1966	New Hampshire	Third and most severe storm of 3 that occurred over a 10-day period. Up to 10 inches of snow across central NH
Snow Storm	December 26-28, 1969	New Hampshire	Up to 41 inches of snow in west central NH
Snow Storm	February 18-20, 1972	New Hampshire	Up to 19 inches of snow in southern NH
Snow Storm	January 19-21, 1978	New Hampshire	Up to 16 inches of snow in southern NH
Blizzard	February 5-7, 1978	New Hampshire	New England-wide. Up to 25 inches of snow in central NH
Snow	1978	Town of Unity	Large snowfall created dangerous drifts in

Storm			the North End of Unity
Snow Storm	April 5-7, 1982	New Hampshire	Up to 18 inches of snow in southern NH
Ice Storm	February 14, 1986	New Hampshire	Fiercest ice storm in 30 yrs in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to Unity NH
Extreme Cold	November-December, 1988	New Hampshire	Temperature was below 0 degrees F for a month
Ice Storm	March 3-6, 1991	New Hampshire	Numerous outages from ice-laden power lines in southern NH
Ice Storm	January 15, 1998	New Hampshire	Federal disaster declaration DR-1199-NH, 20 major road closures, 67,586 without electricity, 2,310 without phone service, \$17+ million in damages to Public Service of NH alone
Ice Storm	January 15, 1998	Town of Unity	83 buildings located above 1000 ft. lost power for several days by the ice storm.
Snow Storms	February 4-March 5, 2001	Town of Unity	58 inches of snow fell within a month. Multiple building collapses from weight of the snow on roofs.
Snow Storm	December 6-7, 2004	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Sullivan Counties	Federal emergency declaration, EM-3193
Snow Storm	January 22-23, 2005	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, Sullivan Counties	Federal emergency declaration, EM-3207
Snow Storm	February 10-11, 2005	Carroll, Cheshire, Coos, Grafton, Sullivan Counties	Federal emergency declaration, EM-3208
Snow Storm	March 11-12, 2005	Carroll, Cheshire, Hillsborough, Rockingham, Sullivan Counties	Federal emergency declaration, EM-3211

*Probability of Future Events*

Three types of winter events are heavy snow, ice storms and extreme cold. Occasionally heavy snow will collapse buildings. Ice storms have disrupted power and communication services. Extreme cold affects the elderly. These random events make it difficult to set a cost to repair or replace any of the structures or utilities affected. The entire town of Unity is at risk of severe winter weather.

Sullivan County, like the rest of New Hampshire, is at high risk of severe winter storms, as identified in the State Hazard Plan. The Unity Hazard Mitigation Committee determined that the probability of future severe winter storm events in the Town is likely, or probable to occur within the next 10 years.

*Assessing Probability, Vulnerability and Risk*

The Committee members completed a Risk Assessment all of the types hazards identified in Chapter III. Appendix E provides a detailed methodology for the Risk Assessment. The process involved assigning Unlikely, Possible, Likely values (numerically 1, 2 or 3) to each hazard type for its potential of occurring based on past historic information. (An n/a score was given if there was insufficient evidence to make a decision). To assess vulnerability, a 1, 2, or 3 value was assigned to each hazard type. Risk was calculated by multiplying probability by the vulnerability. Low-Medium-High risk was assigned as shown below.

0-1.9- Low      2.0-3.9- Low-Med      4-5.9- Med      6-7.9- Med-High      8-9- High

The Committee members completed a risk assessment of all type of hazards identified in Chapter III. The process also involved assigning vulnerability based on the Committee’s opinion of the extent of damage the hazard may cause based on past occurrences and current assessments of the Town. Great amount of damage and cost (3), moderate amount of damage and cost (2), and limited damage or costs (1).

Risk Assessment

Hazards (Natural & Manmade)	Probability of Occurrence Likely (3), Possible (2), Unlikely (1)	Probability based on State Hazard Plan Likely (3), Possible (2), Unlikely (1)	Average of Probabilities	Vulnerability based on State Hazard Plan High (3), Moderate (2), Low (1)	Vulnerability High (3), Moderate (2), Low (1)	Average of Vulnerabilities	Risk Rating (Probability x Vulnerability)
Flooding	3	3	3	1	3	2	<b>6</b>
Dam Failure	n/a	1	1	1	n/a	1	<b>1</b>
Drought	1	2	1.5	1	1	1	<b>1.5</b>
Wildfire	2	3	2.5	1	3	2	<b>5</b>
Earthquake	n/a	2	1.5	1	n/a	1	<b>1.5</b>
Landslide	1	2	2	1	1	1	<b>2</b>
Tornado & Downburst	2	2	2	1	1	1	<b>2</b>
Hurricane	2	2	2	1	1	1	<b>2</b>
Lightning	n/a	2	2	1	n/a	1	<b>2</b>
Severe Winter Weather	3	3	3	1	1	1	<b>3</b>



## SECTION IV

### CRITICAL FACILITIES/LOCATIONS

The Critical Facilities list, identified by the Unity Hazard Mitigation Committee, is divided into three categories. The first category contains facilities needed for emergency response in the event of a disaster. The second category contains non-emergency response facilities that are not required in an event, but that are considered essential for the everyday operation of the Town of Unity. The third category contains facilities/populations that the Committee wishes to protect in the event of a disaster.

#### Emergency Response Facilities, Services & Structure

<u>Critical Facility</u>	<u>Replacement Value</u>
<u>Fire Department</u>	\$175,740.00
<u>Police Department/Town Office</u>	\$408,810.00
<u>Highway Department</u>	\$68,430.00
<u>Sullivan County Complex (Nursing Home, Sullivan County Jail, Water Treatment Plant)</u>	\$11,192,900.00
<u>State Road Facility</u>	\$32,850.00

#### Non-Emergency Response Facilities and Services

(Town buildings & operations, historic buildings, recreational facilities, etc.)

<u>Critical Facility</u>	<u>Replacement Value</u>
Will's Store	\$191,450
Town Hall	\$168,420
Unity Elementary School	\$547,910
Transfer Station	\$78,190
Gillman Pond Water Distribution Station	\$1,200,760
West Unity Church	\$125,490
Quaker City Meeting House	\$10,960
East Unity Schoolhouse	\$172,670

**Facilities/Populations to Protect**

<u>Critical Facility</u>	<u>Replacement Value</u>
Residences along Cold Pond Road and Unity Stage Road	\$4,592,000
Residences along Old Cheshire Road	\$940,100

## SECTION V

### DETERMINING HOW MUCH WILL BE AFFECTED

#### IDENTIFYING VULNERABLE COMMUNITY ELEMENTS

The tables below provide a summary of the vulnerability of the community elements to each hazard identified by the Unity Hazard Mitigation Committee. The risk rating calculated in the risk assessment is included for each hazard. The replacement value for structures vulnerable for each hazard is included.

To create this table, the Unity Hazard Mitigation Committee identified the critical facilities vulnerable to each hazard as well as identified structures, infrastructure, and special populations that have been affected by these hazards in the past or are likely to be affected in the future (see Profile of Natural Hazards, starting on page 10). The Digital Flood Insurance Rate Map for the Town of Unity was checked to determine which critical facilities lie within the 100-year floodplain. Natural resource vulnerability was assessed based on the most likely types of natural resources to be impacted by each hazard; detailed information on these resources was not available, so a general assessment was made.

A subdivision of several residences is planned to be built in the future along the Second New Hampshire Turnpike; the number of residences and their estimated value is unknown. This is the extent of planned future development in the Town of Unity, so vulnerability of other undeveloped land in the Town was not analyzed.

FLOODING – Medium-High Risk – Community Elements at Risk	
Structures	21 Residences along Cold Pond Road and Unity Stage Road -- \$4,592,000 5 Residences along Old Cheshire County Road -- \$940,100 Future subdivision (multiple residences) along Second New Hampshire Turnpike -- \$ unknown Critical Facilities within 100-year floodplain, Fire Department, Highway Department, Gillman Pond Water Distribution Station – replacement values listed in Tables 5 & 6
Infrastructure	Cold Pond Road, Unity Stage Road, Old Cheshire County Road, Second New Hampshire Turnpike - roadways, culverts, utility network along these roads
Special Populations	Residents along Cold Pond Road, Unity Stage Road, Old Cheshire County Road
Natural Resources	Forest and agricultural resources, and water resources are vulnerable.
DAM BREACH OR FAILURE – Low Risk -- Community Elements at Risk	
Structures	None identified
Infrastructure	Coon Brook Road - Roadway, culverts, utility network along this road
Special Populations	Residents in 8 homes on Coon Brook Road would be stranded if Coon Brook Dam failed
Natural Resources	Water resources and wildlife habitat are vulnerable.

DROUGHT – Low Risk -- Community Elements at Risk

Structures None identified  
 Infrastructure Sullivan County Complex Water Treatment Plant, Gillman Pond Water Distribution Station  
 Special Populations All populations in Unity are vulnerable.  
 Natural Resources Forest and agricultural resources and water resources are vulnerable.

WILDFIRE – Medium Risk -- Community Elements at Risk

Structures 4 structures in North Shore area -- \$ unknown  
 All structures are vulnerable -- \$ unknown  
 All Structures listed as Critical Facilities in Tables 4 & 5 -- \$18,026,480  
 Infrastructure Sullivan County Complex Water Treatment Plant, Gillman Pond Water Distribution Station, utility network  
 Special Populations All populations in Unity are vulnerable.  
 Natural Resources Forest and agricultural resources, and water resources are vulnerable.

EARTHQUAKE – Low Risk -- Community Elements at Risk

Structures All structures are vulnerable -- \$ unknown  
 All Structures listed as Critical Facilities in Tables 4 & 5 -- \$18,026,480  
 It is unknown how many structures were not built to seismic code.  
 It is unknown if dam failure is likely due to earthquake; all dams are low hazard or non-menace.  
 Infrastructure Roads, bridges (2 in town), culverts, utility network, Sullivan County Complex Water Treatment Plant, Gillman Pond Water Distribution Station  
 Special Populations All populations in Unity are vulnerable.  
 Natural Resources Water resources are vulnerable.

LANDSLIDE – Low-Medium Risk -- Community Elements at Risk

Structures None identified  
 Infrastructure Cold Pond Road, Copeland Brook Road near to Little Sugar River – roads, utility network  
 Special Populations None identified  
 Natural Resources Forest resources and water resources are vulnerable.

TORNADO AND DOWNBURST – Low-Medium Risk -- Community Elements at Risk

Structures 13 Structures on Britton Hill and Straw Hill -- \$14,374,580  
 All Structures listed as Critical Facilities in Tables 4 & 5 – see tables  
 Infrastructure Roads, utility network on Britton Hill and Straw Hill and near to Critical Facilities  
 Special Populations Residents on Britton Hill and Straw Hill  
 All populations in Unity are vulnerable.  
 Natural Resources Forest and agricultural resources are vulnerable.

HURRICANE – Low-Medium Risk -- Community Elements at Risk

Structures All Structures in Town are vulnerable  
 All Structures listed as Critical Facilities in Tables 4 & 5 – \$18,026,480  
 Infrastructure Roads, bridges (2 in town), culverts, utility network in entire town  
 Special Populations All populations in Unity are vulnerable.  
 Natural Resources Forest and agricultural resources are vulnerable.

	<b>LIGHTNING – Low-Medium Risk -- Community Elements at Risk</b>
Structures	All Structures in Town are vulnerable -- \$ unknown All Structures listed as Critical Facilities in Tables 4 & 5 -- \$18,026,480
Infrastructure	Utility network in entire town
Special Populations	All populations in Unity are vulnerable.
Natural Resources	Forest resources are vulnerable.
	<b>SEVERE WINTER WEATHER – Low-Medium Risk -- Community Elements at Risk</b>
Structures	13 Residences and Town Buildings near Coon Brook, Straw Hill, North Shore -- \$899,590 21 Residences along Cold Pond Road and Unity Stage Road -- \$4,592,000 5 Residences along Old Cheshire County Road -- \$940,100 Future subdivision (multiple residences) along Second New Hampshire Turnpike -- \$ unknown Town Office/Police Department -- \$408,810 Fire Department -- \$175,740 Highway Department -- \$68,430 Transfer Station -- \$78,190
Infrastructure	Roads, utility network near structures listed above
Special Populations	Residents near Coon Brook, Straw Hill, North Shore, Cold Pond Road, Unity Stage Road, Old Cheshire County Road All populations in Unity are vulnerable. The elderly are vulnerable to extreme cold.
Natural Resources	Forest resources are vulnerable.

## POTENTIAL LOSS ESTIMATES

This section identifies areas in town that are most vulnerable to hazard events and estimates potential losses from these events. It is difficult to ascertain the amount of damage caused by a natural hazard because the damage will depend on the hazard’s extent and severity, making each hazard event quite unique. In addition, human loss of life was not included in the potential loss estimates, but could be expected to occur. Potential loss estimates were generated using the best available data and using the Technical Assistance document for Assessing Vulnerability provided by FEMA and FEMA’s Understanding Your Risks: Identifying Hazards and Estimating Losses.

As of 2005, 670 residences were located in the Town of Unity; the total valuation of residences for the Town was not available. The median value of owner-occupied housing units in the State of New Hampshire, according to the 2000 Census, is \$138,548. Using these two data sources, residential structures in the Town of Unity are valued at an estimated \$92,827,160. Valuation of commercial buildings and other structures for the Town was not available. The total assessed value of the critical facilities identified in Tables 5 and 6 is \$18,026,480. Thus, the best available estimate of total town building value is \$ 110,853,640.

As of 2006, there are 699.20 acres of farmland and 15,157.78 acres of forest land, as listed in the Current Use Report within the 2006 Town Annual Report. The value of this farm and forest land is not known, and so it is impossible to assess the potential loss estimate for these natural resources.

The ability of the Unity Hazard Mitigation Committee to complete potential loss estimates was greatly hindered by lack of data, including but not limited to assessed value of all buildings within the Town, assessed value of farmland and forestland within the Town, base flood elevations from the Digital Flood Insurance Rate Map, seismic design level for buildings within the Town, mapped locations of structures within the Town and loss estimates from previous hazard events within the Town. In addition, resources for the development of this plan did not permit the inclusion of structure, contents, and function losses to present a full picture of total losses and impacts. Collection of these datasets to complete and improve future risk assessment analysis should be done when this mitigation plan is updated in the future.

### **Flooding**

In Table 8, 26 residences and 3 town-owned structures have been identified as being at risk for flooding. The total replacement value of these structures would be \$6,977,030.

Base flood elevations for special flood hazard areas have not been determined in the Digital Flood Insurance Rate Map for the Town of Unity, therefore it is not possible to determine the likely height of flooding. However, in the event of 4-ft flooding, causing 28% damage (assuming all structures are one to two stories with basements), the potential loss estimate is \$1,953,568.

### **Dam Failure**

In Table 8, no structures have been identified as being vulnerable to dam failure. The cost of replacing a section of Coon Brook Road and utility lines along the road if washed out could not be determined.

### **Drought**

In Table 8, no structures have been identified as being vulnerable to drought. The Sullivan County Complex Water Treatment Plant and the Gillman Pond Water Distribution Station, which serves the Town of Newport, are vulnerable to drought, in that a water shortage may cause loss of function. The potential loss estimate for functional loss has not been determined.

As of 2006, there are 699.20 acres of farmland as listed in the Current Use Report within the 2006 Town Annual Report. The value of this farmland is not known, and so it is impossible to assess the potential loss estimate for this vulnerable natural resource.

### **Wildfire**

In Table 8, all structures in the Town of Unity, including all critical facilities, are at risk of wildfire. It is unlikely that a single wildfire would destroy all structures in the Town of Unity. The most recent wildfire in Unity burned 4-5 acres in the North Shore area. Four residences are located near the burn area, and if those houses were to be destroyed in a wildfire, the replacement value is estimated at \$554,192. This estimate is based on the median value of a residence in New Hampshire (\$138,548).

The cost to control a forest fire is roughly \$1,000 per acre for labor and materials. The potential loss of forest and agricultural resources could not be estimated.

### **Earthquake**

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and precipitate landslide and flash flood events.

Assuming 1% to 5% town-wide residential and critical facility building damage, an earthquake could result in \$1,108,536 to \$5,542,682 in building damages.

The costs for repairing or replacing roadways, power lines, telephone lines, dams, and the contents of structures has not been included in these estimates.

### **Landslide**

In Table 8, sections of two roads near the Little Sugar River have been identified as vulnerable to landslides. The costs for repairing or replacing roadways could not be determined due to lack of data on road repair costs.

### **Tornado and Downburst**

Tornadoes are relatively uncommon natural hazards in the State. On average, about six touch down each year. However, damage largely depends on where a tornado strikes. If it strikes an inhabited area, the impacts could be severe. In the State of New Hampshire, the total cost of tornadoes between 1950 and 1995 was \$9,071,389 (*The Disaster Center*). The cost of a tornado in Unity would not be town-wide as that is not the nature of a tornado. Dollar amounts would depend on whether the tornado hit an area with a high density of buildings.

If a tornado impacted 1% of the town's residences and critical facilities, it could result in \$1,108,536 in building damage.

In Table 8, 13 structures were identified as vulnerable to downburst; the total replacement value is estimated at \$14,374,850. If these structures sustained 10% damage, the potential loss is estimated at \$1,437,485.

The costs for repairing or replacing roadways, power lines, telephone lines, dams, and the contents of structures has not been included in these estimates.

### **Hurricane**

Damage caused by hurricanes can be both severe and expensive. In the past, Unity has been impacted by wind and flooding damage as a result of hurricanes. The estimated value of all residential structures and critical facilities in Unity is \$ 110,853,640.

Assuming 1% to 5% town-wide building damage, a hurricane could result in \$1,108,536 to \$5,542,682 in residential building damages.

The costs for repairing or replacing roadways, power lines, telephone lines, dams, and the contents of structures has not been included in these estimates.

### **Lightning**

The entire Town of Unity is vulnerable to lightning. Lightning strikes one point on the ground at a time, therefore a town-wide loss estimate is unrealistic. If one residence were destroyed due to fire caused by a lightning strike, the replacement value is estimated at \$138,548, the median value of an owner-occupied unit in the State of New Hampshire.

Electronic equipment within a structure as well as utility networks are vulnerable to lightning strikes; loss estimates of contents and function were not able to be completed.

### **Severe Winter Weather**

In Table 8, 37 residences and town buildings were identified as being vulnerable to severe winter weather. The total replacement value of these structures is \$6,431,690. If these structures were to sustain 10% damage, the potential loss is estimated at \$643,169.

Four critical facilities were identified as vulnerable to severe winter weather. The total replacement value of these structures is \$731,170. If these structures were to sustain 10% damage, the potential loss is estimated at \$73,117.

The road and utility network is also vulnerable to severe winter weather. Estimates for repair of these networks were not available.



## SECTION VI

### EXISTING MITIGATION STRATEGIES

The next step involves identifying existing mitigation strategies for the hazards likely to affect the Town and evaluating their effectiveness. The following is a list of current policies, regulations and programs in the Town of Unity that protect people and property from natural and man-made hazards.

#### Strategies Mitigating Multiple Hazards

- The Town of Unity Emergency Operations Plan (EOP) helps to organize response efforts in the event of a hazard thereby lessening damages to structures and infrastructure. The whole town is protected by the EOP. The Emergency Management Director is in charge of enforcing policies set forth in the document.
- The Conservation Commission is working on a conservation overlay district to restrict development in areas that are not suitable, e.g. this strategy will mitigate damages caused by a landslide by restricting development on steep slopes.
- The Town of Unity participates in ongoing training for fire and police personnel where mitigation practices are addressed.
- The Town participates in mutual aid for the Fire and Police Departments. This effort makes available to the Town of Unity resources for the protection of people and property.
- The Town follows state guidelines for burning permits. The Fire Warden is in charge of enforcement and of the issuing of permits.
- The Town of Unity has a winter maintenance policy for town roads and has designated Neal Mine Road and Unity Stage Road as emergency lanes. These efforts provide access to more remote areas of town in the event of a hazard. This increases the likelihood that people and structures will be less impacted from hazards events due to quicker response times. The Road Agent is in charge of enforcing the winter maintenance policy.
- The Town of Unity has an active planning board that enforces the Zoning Ordinance which guides decisions on what gets built and where. Development should not occur in areas that are unsuitable.
- The State Department of Transportation regularly inspects bridges and larger culverts. The road system in Unity is protected by these efforts.
- The Town of Unity completed bank stabilization work in the fall of 2006 along Gillman Pond Road which mitigates flooding, landslide and potential ice jams during winter weather.
- The State of New Hampshire re-engineered culverts along the Second New Hampshire Turnpike to prevent the road from washing out in the event of flood.
- The Town of Unity has protected Hurd Pond Road against erosion from flood waters by adding stone and rip rap to the road's edge.
- The Town of Unity maintains fire ponds to mitigate potential wildfires.
- The Town of Unity Building Inspector has building code standards which are enforced by the Board of Selectmen.

## **Summary of Recommended Improvements**

The Unity Hazard Mitigation Team recommended improvements to existing programs and potential mitigation measures as follows:

- The Committee would like to update the Town of Unity EOP to be consistent with the format set forth by the State of New Hampshire.
- The Committee would like to acquire proper signage to post in the event of a hazard. This effort would lessen the damage to the Town's infrastructure.
- The Committee suggested that the Town Planning Board craft and adopt an ordinance regarding the construction of new structures in the floodplain.
- The Committee would like Unity to participate in highway mutual aid.
- The Committee would like to increase the amount of education and outreach that takes place in the Town to inform citizens of mitigation measures they can take to protect property.

## SECTION VII

### NEWLY IDENTIFIED MITIGATION ACTIONS

#### POTENTIAL MITIGATION ACTIONS

The Unity Hazard Mitigation Committee brainstormed potential mitigation actions at a meeting on December 19, 2006. The new proposed measures are organized by the type(s) of hazard event that the mitigation action is expected to mitigate.

##### **Multiple Hazards**

- Update the Town of Unity Emergency Operations Plan to provide a quicker response to hazards. This effort will save structures and infrastructure.
- Participate in highway mutual aid to increase resources dedicated to mitigating hazards along the Town's road system.
- Publish a periodic article in the Town Newsletter to inform citizens of mitigation efforts throughout the Town of Unity.
- Upgrade highway equipment to better maintain infrastructure such as roads, bridges and culverts.
- Create a Capital Improvements Program to make available funding for equipment that aids the Town in lessening damages to structures and infrastructure.
- Acquire signage to warn the public of a hazard event so they may prepare or avoid causing further damage to the Town's infrastructure.

##### **Flooding**

- Replace the Center Road Culvert to increase its capacity and avoid future flooding occurrences.
- Adopt a floodplain ordinance.
- Replace the Gillman Pond Road culvert to prevent future flooding events.
- Increase culvert sizes along Coon Brook Road and Old Cheshire County Road to mitigate flooding events.
- Stabilize the bank of the Little Sugar River where it approaches Copeland Brook Road to prevent flooding and a loss of infrastructure.
- Practice debris clearing along the Little Sugar River to prevent flooding.

##### **Severe Winter Weather**

- Acquire generators to provide citizens of Unity with shelter in the event of a severe winter storm and resulting power outage. Structures will also be protected.

## **Hurricane**

- Update building codes to protect structures against powerful wind gusts associated with hurricanes.

## **Tornado and Downburst**

- Update building codes to protect structures against powerful wind gusts associated with tornados and downbursts.

## **Wildfire**

- On-going training of fire and emergency services personnel.
- Update fire equipment used in lessening the damages caused by wildfire.

## **Earthquake**

- Update building codes to protect structures in the infrequent event of a small earthquake.

## **Landslide**

- Establish a steep slopes ordinance to protect new structures from areas of potential landslides.
- Stabilize the bank along Cold Pond Road to protect infrastructure in the event of a landslide.

## **SUMMARY OF CRITICAL EVALUATION**

The Unity Hazard Mitigation Team reviewed each of the newly identified mitigation strategies using the following factors:

- Does it reduce disaster damage?
- Does it contribute to community objectives?
- Can it be quickly implemented?
- Is it socially acceptable?
- Is it technically feasible?
- Is it administratively possible?
- Is the action legal?
- Does the action offer reasonable benefit compared to cost of implementation?

The Unity Hazard Mitigation Committee assigned the following scores (Table 8) to each strategy for its effectiveness related to the critical evaluation questions listed above. For each critical evaluation question the Committee assigned a 1, 2, or 3 to the strategy being scored. Three indicated that the strategy ranked high in regard to the evaluation question, and one indicated that the strategy ranked low in regard to the evaluation question. The

sum of the scores for each evaluation question equals the overall score for a particular strategy. The highest score suggests the highest priority. The highest possible total score is 24.

**Table 8: Project Evaluation**

<b>Project</b>	<b>Score</b>	<b>Additional Cost/Benefit Consideration</b>	<b>Mitigate Existing or New Built Environment, or Both?</b>
Publish a periodic article in the Town Newsletter to inform citizens of mitigation efforts throughout the Town of Unity.	24	Public education and outreach is inexpensive to the Town and can help to protect public and private property.	Both
Update fire equipment used in mitigating wild and structure fire.	24	The benefits gained from this measure in the way of protecting public and private property from damages outweigh the expense of purchasing the equipment.	Both
Upgrade highway equipment to better maintain roads, bridges and culverts.	24	The benefit to public and private property outweighs the cost of the equipment.	Both
Create a capital improvements program to indirectly aid the Town in the maintenance of public property and infrastructure.	24	The benefits of this structure will be seen over a number of years in the future, outweighing the cost to draft and implement the Program.	Both
Acquire signage to be used in the event of a hazard to protect public property and infrastructure.	22	The expense of acquiring the signage is high and the benefits will only be incurred in the event of a hazard.	Both
Replace Center Road culvert, Gillman Road Pond culvert, Coon Brook Road culvert and Old Cheshire County Road culvert.	20	The culvert replacements are expensive but will benefit the Town of Unity by mitigating potential flooding events.	Existing
Craft and adopt an ordinance on limiting new development in the floodplain.	20	This effort would only be beneficial in saving future development from a flooding hazard.	New

Participate in highway mutual aid.	20	The cost of this effort is very low and the resources available to the Town of Unity would be greatly increased.	Both
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## SECTION VIII PRIORITIZED IMPLEMENTATION SCHEDULE

A prioritized implementation schedule was created according to the results of the project evaluation on the preceding page. Projects are scheduled in order of priority, from highest rank (24) to lowest rank (20). One exception is the highway mutual aid, which had a lower priority score (20) from the evaluation, but due to the low cost and relative ease of implementation. The Unity Hazard Mitigation Committee created the following action plan for implementation of priority mitigation strategies:

**Table 9: Implementation Schedule**

Mitigation Action	Who (Leadership)	When (Deadline)	Cost/Funding Source
Publish a periodic article in the Town Newsletter to inform citizens of mitigation efforts throughout the Town of Unity. (24)	Town of Unity Staff	Fall 2007	Volunteer and Staff Time in addition to Printing Costs
Participate in highway mutual aid. (20)	Board of Selectmen Highway Department	Fall 2007	Staff Time Town Funds
Create a capital improvements program to indirectly aid the Town in the maintenance of public property and infrastructure. (24)	Board of Selectmen Planning Board	Spring 2008	Volunteer and Staff Time Town Funds
Update fire equipment used in mitigating wildfire. (24)	Board of Selectmen	Town Meeting 2008	Town Funds
Upgrade highway equipment to better maintain roads, bridges and culverts. (24)	Board of Selectmen Road Agent	Town Meeting 2008	Town Funds
Acquire signage to be used in the event of a hazard to protect public property and infrastructure. (22)	Board of Selectmen Road Agent	Town Meeting 2008	Town Funds
Craft and adopt a floodplain ordinance. (20)	Planning Board	Town Meeting 2008	Volunteer and Staff Time
Replace Center Road culvert, Gillman Road Pond culvert, Coon Brook Road culvert and Old Cheshire County Road culvert. (20)	Board of Selectmen Highway Department	2008	Staff Time Town Funds

## **SECTION IX**

### **ADOPTION & IMPLEMENTATION OF THE PLAN**

A good plan needs to provide for periodic monitoring and evaluation of its successes and challenges, and to allow for updates of the Plan where necessary. In order to track progress and update the Mitigation Strategies identified in the Plan, the Town of Unity will review the Hazard Mitigation Plan *annually, or after a hazard event*. The Plan will be updated on a five-year cycle. The Unity Emergency Management Director will initiate this review, or update and should consult with the Hazard Mitigation Committee. It is recommended that more resources be allocated toward the collection of data to improve the risk assessment and estimate of potential losses. Changes will be made to the plan to accommodate for projects that have failed, or that are not considered feasible after a review for their consistency with the evaluation criteria, the timeframe, the community's priorities, and funding resources. Priorities that were not ranked highest, but that were identified as potential mitigation strategies, will be reviewed as well during the monitoring and update of this plan, to determine feasibility for future implementation. During the five-year update, there will be a public hearing to receive public comment, and the Board of Selectmen will adopt the final Plan.

#### **Implementation Through Existing Programs**

The Plan will be adopted locally as a stand-alone document. The Board of Selectmen, during the Capital Improvement Process, will review and include any proposed structural projects outlined in this plan. During periods of review or update the Hazard Mitigation Committee will consult the Unity Master Plan to ensure that the Hazard Mitigation Plan doesn't conflict with the Master Plan.

#### **Continued Public Involvement**

The public will continue to be involved in the hazard mitigation planning process. In future years, a public meeting will be held (separate from the adoption hearing) to inform and educate members of the public. Prior to the meeting, a press release will be distributed, and information will be posted in the Town.

By nature, natural hazards affect areas not defined by political boundaries. Additionally, response to these disasters often may rely on neighboring communities for assistance such as the mutual aid services. Because of this it is important to notify and work with adjacent communities. Notification of this plan and its meetings were publicly noticed and posted, although direct invitations were not made to neighboring municipalities of Acworth, Charlestown, Claremont, Goshen, Lempster, and Newport. Future iterations and updates to this plan will incorporate invitations to those communities to comment and participate in the planning process.



Support for mitigation strategies is important in order to carry out implementation. Although this Hazard Mitigation Plan for the Town of Unity was unable to interest additional parties, every effort will be made in the future to incorporate representation in future revisions of this plan. In order to ensure in the future that opportunity to participate in the planning process is given to other interested parties, the Town will send invitations to local businesses, educational institutions and non-profit organizations. Revisions of this plan shall incorporate press releases that will notice citizens, businesses and organizations of the progress of the plan while also soliciting input that could strengthen the value of the plan. This process will enable more successful implementation actions.

Upon notification from FEMA that this plan is been conditionally approved, the Town of Unity will hold a public hearing. At this public hearing, public comment and input regarding the plan shall be taken. Once public input has been heard, the Town shall adopt the plan with any improvements or recommended changes that are appropriate.

Copies of the HazMit Plan have been or will be sent to the following parties for review and comment:

- Emergency Management Directors, neighboring towns
- Jeremy LaPlante, Field Representative, NH BEM
- Board of Selectmen
- Conservation Commission
- Planning Board
- Police Dept.
- Fire Dept.
- Highway Dept.

# **Adoption Resolution**

## **APPENDICES**

**APPENDIX A: TECHNICAL RESOURCES**

**APPENDIX B: TECHNICAL AND FINANCIAL ASSISTANCE**

**APPENDIX C: MATRIX OF FEDERAL ALL-HAZARDS GRANTS**

**APPENDIX D: MEETING DOCUMENTATION**

**APPENDIX E: METHODOLOGY FOR RISK ASSESSMENT  
MATRIX**

**APPENDIX F: WILDLAND/URBAN INTERFACE MAP**

**APPENDIX G: 100-YEAR FLOODPLAIN MAP**

# APPENDIX A

## TECHNICAL RESOURCES

### Agencies

<b>New Hampshire Bureau of Emergency Management</b>	271-2231
Hazard Mitigation Section	271-2231
<b>Federal Emergency Management Agency</b>	(617) 223-4175
<b>NH Regional Planning Commissions:</b>	
Upper Valley Lake Sunapee Regional Planning Commission	448-1680
<b>NH Executive Department:</b>	
Governor's Office of Energy and Community Services	271-2611
New Hampshire Office of State Planning	271-2155
<b>NH Department of Cultural Affairs:</b>	271-2540
Division of Historical Resources	271-3483
<b>NH Department of Environmental Services:</b>	271-3503
Air Resources	271-1370
Waste Management	271-2900
Water Resources	271-3406
Water Supply and Pollution Control	271-3504
Rivers Management and Protection Program	271-1152
<b>NH Office of State Planning and Energy Programs</b>	271-2155
<b>NH Municipal Association</b>	224-7447
<b>NH Fish and Game Department</b>	271-3421
<b>NH Department of Resources and Economic Development:</b>	271-2411
Natural Heritage Inventory	271-3623
Division of Forests and Lands	271-2214
Division of Parks and Recreation	271-3255
<b>NH Department of Transportation</b>	271-3734
<b>Northeast States Emergency Consortium, Inc. (NESEC)</b> .....	(781) 224-9876
<b>US Department of Commerce:</b>	
National Oceanic and Atmospheric Administration:	

National Weather Service; Gray, Maine .....207-688-3216

**US Department of the Interior:**

US Fish and Wildlife Service ..... 225-1411  
US Geological Survey ..... 225-4681  
US Army Corps of Engineers .....(978) 318-8087

**US Department of Agriculture:**

Natural Resource Conservation Service ..... 868-7581

**Mitigation Funding Resources**

Hazard Mitigation Grant Program (HMGP) ..... NH Office of Emergency Management  
Public Assistance and Hazard Mitigation ..... NH Office of Emergency Management  
Community Development Block Grant (CDBG) ..... NH OEM, NH OSP, also refer to RPC  
Dam Safety Program ..... NH Department of Environmental Services  
Disaster Preparedness Improvement Grant (DPIG) ..... NH Office of Emergency Management  
Emergency Generators Program by NESEC<sup>‡</sup> ..... NH Office of Emergency Management  
Emergency Watershed Protection (EWP) Program  
..... USDA, Natural Resources Conservation Service  
Flood Mitigation Assistance Program (FMAP) ..... NH Office of Emergency Management  
Flood Plain Management Services (FPMS) ..... US Army Corps of Engineers  
Mitigation Assistance Planning (MAP) ..... NH Office of Emergency Management  
Mutual Aid for Public Works ..... NH Municipal Association  
National Flood Insurance Program (NFIP) <sup>†</sup> ..... NH Office of State Planning  
Power of Prevention Grant by NESEC<sup>‡</sup> ..... NH Office of Emergency Management  
Project Impact ..... NH Office of Emergency Management  
Roadway Repair & Maintenance Program(s) ..... NH Department of Transportation  
Section 14 Emergency Stream Bank Erosion & Shoreline Protection

.....	US Army Corps of Engineers
Section 103 Beach Erosion.....	US Army Corps of Engineers
Section 205 Flood Damage Reduction .....	US Army Corps of Engineers
Section 208 Snagging and Clearing.....	US Army Corps of Engineers
Shoreline Protection Program.....	NH Department of Environmental Services
Various Forest and Lands Program(s) .....	.....NH Department of Resources and Economic Development
Wetlands Programs .....	NH Department of Environmental Services

‡NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH BEM for more information.

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

## Websites

<b>Sponsor</b>	<b>Internet Address</b>	<b>Summary of Contents</b>
Natural Hazards Research Center, U. of Colorado	<a href="http://www.colorado.edu/litbase/hazards">http://www.colorado.edu/litbase/hazards</a>	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	<a href="http://wxp.eas.purdue.edu/hurricane">http://wxp.eas.purdue.edu/hurricane</a>	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	<a href="http://nemaweb.org">http://nemaweb.org</a>	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	<a href="http://www.gsfc.nasa.gov/ndrd/disaster/">http://www.gsfc.nasa.gov/ndrd/disaster/</a>	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	<a href="http://ltpwww.gsfc.nasa.gov/ndrd/main/html">http://ltpwww.gsfc.nasa.gov/ndrd/main/html</a>	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	<a href="http://www.statelocal.gov/">http://www.statelocal.gov/</a>	General information through the federal-state partnership.
<b>Sponsor</b>	<b>Internet Address</b>	<b>Summary of Contents</b>
National Weather Service	<a href="http://nws.noaa.gov/">http://nws.noaa.gov/</a>	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	<a href="http://h20.usgs.gov/public/realtime.html">http://h20.usgs.gov/public/realtime.html</a>	Provisional hydrological data
Dartmouth Flood Observatory	<a href="http://www.dartmouth.edu/artsci/geog/floods/">http://www.dartmouth.edu/artsci/geog/floods/</a>	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	<a href="http://www.fema.gov/fema/csb.htm">http://www.fema.gov/fema/csb.htm</a>	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	<a href="http://www.met.fsu.edu/explores/tropical.html">http://www.met.fsu.edu/explores/tropical.html</a>	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	<a href="http://lightningsafety.com/">http://lightningsafety.com/</a>	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	<a href="http://www.ghcc.msfc.nasa.gov/otd.html">http://www.ghcc.msfc.nasa.gov/otd.html</a>	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	<a href="http://www.wep.es.llnl.gov/wwwep/ghp.html">http://www.wep.es.llnl.gov/wwwep/ghp.html</a>	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	<a href="http://www.tornadoroject.com/">http://www.tornadoroject.com/</a>	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	<a href="http://www.nssl.uoknor.edu/">http://www.nssl.uoknor.edu/</a>	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	<a href="http://www.iaa.iix.com/ndcmap.htm">http://www.iaa.iix.com/ndcmap.htm</a>	A multi-disaster risk map.
Earth Satellite Corporation	<a href="http://www.earthsat.com/">http://www.earthsat.com/</a>	Flood risk maps searchable by state.
USDA Forest Service Web	<a href="http://www.fs.fed.us/land">http://www.fs.fed.us/land</a>	Information on forest fires and land management.
Northeast Emergency Consortium	<a href="http://www.serve.com/NESEC">http://www.serve.com/NESEC</a>	Information on disasters and preparedness.

# APPENDIX B

## TECHNICAL AND FINANCIAL ASSISTANCE

### TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION

*Note – Communities must have an approved Hazard Mitigation Plan to be eligible for HMGP and PDM grants.*

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#### ◆ HAZARD MITIGATION GRANT PROGRAM "Section 404 Mitigation"

The Hazard Mitigation Grant Program (HMGP) in New Hampshire is administered in accordance with the 404 HMGP Administration Plan, which was derived under the authority of Section 404 of the Stafford Act in accordance with Subpart N. of 44 CFR.

**The program receives its funding pursuant to a Notice of Interest submitted by the Governor's Authorized Representative (or GAR, i.e. the Director of NHOEM) to the FEMA Regional Director within 60 days of the date of a Presidentially Declared Disaster. The amount of funding that may be awarded to the State/Grantee under the HMGP may not exceed 15% of (over and above) the overall funds as are awarded to the State pursuant to the Disaster Recovery programs as are listed in 44 CFR Subpart N. Section 206.431 (d) (inclusive of all Public Assistance, Individual Assistance, etc.). Within 15 days of the Disaster Declaration, an Inter-Agency Hazard Mitigation Team is convened consisting of members of various Federal, State, County, Local and Private Agencies with an interest in Disaster Recovery and Mitigation. From this meeting, a Report is produced which evaluates the event and stipulates the State's desired Mitigation initiatives.**

#### Minimum Project Criteria

- Must conform with the State's "409" Plan
- Have a beneficial impact on the declared area
- Must conform to:
  - NFIP Floodplain Regulations
  - Wetlands Protection Regulations
  - Environmental Regulations
  - Historical Protection Regulations
- Be cost effective and substantially reduce the risk of future damage
- Not cost more than the anticipated value of the reduction of both direct damages and subsequent negative impacts to the area if future disasters were to occur i.e., min 1:1 benefit/cost ratio
- Both costs and benefits are to be computed on a "net present value" basis
- Has been determined to be the most practical, effective and environmentally sound alternative after a consideration of a range of options
- Contributes to a long-term

Upon the GAR's receipt of the notice of an award of funding by the Regional Director, the State Hazard Mitigation Officer (SHMO) publishes a Notice of Interest (NOI) to all NH communities and State Agencies announcing the availability of funding and solicits applications for grants. The 404 Administrative Plan calls for a State Hazard Mitigation Team to review all applications. The Team is comprised of individuals from various State Agencies.



## Flood Mitigation Assistance (FMA) Program

*Eligible Subgrantees include:*

State and Local governments,  
Certain Not for Profit Corporations  
Indian Tribes or authorized tribal  
organizations  
Alaskan corporations not privately  
owned.

In 1997, the State was awarded funds to assist communities with Flood Mitigation Planning and Projects. A Planning Grant from the 1996/97 fund was awarded to the City of Keene in 1998. In preparation for the development of the Flood Mitigation Plan, the Planning Department of the City of Keene created a digital database of its floodplain including the digitizing of its tax assessing maps as well as its Special Flood Hazard Areas in GIS layers. The Plan Draft was submitted to FEMA for review and approval in March of 2000. The Plan includes a detailed inventory of projects and a "model" project prioritization approach.

In 1998, the FMAP Planning Grant was awarded to the Town of Salem. Given the complexity of the issues in the Spicket River watershed, the Town of Salem subcontracted a substantial portion of the development of its Flood Mitigation Planning to SFC Engineering Partnership of Manchester, NH, a private engineering firm. Salem submitted a Plan and proposed projects to the State and FEMA in May of 1999, which were approved by FEMA. This made Salem the first community in NH to have a FEMA/NFIP approved Flood Mitigation Plan.

New Hampshire has been a participant in the Flood Mitigation Assistance Program (FMA or FMAP) since 1996/97. In order to be eligible, a community must be a participant in the National Flood Insurance Program.

*Eligible Projects may be of any nature that will result in the protection to public or private property and include:*

Structural hazard control or  
protection projects  
Construction activities that will  
result in protection from hazards  
Retrofitting of facilities  
Certain property acquisitions or  
relocations  
Development of State and local  
mitigation standards  
Development of comprehensive  
hazard mitigation programs with  
implementation as an essential  
component  
Development or improvement of  
warning systems

*Flood Mitigation Assistance Program:*

NFIP Funded by a % of Policy  
Premiums  
Planning Grants  
Technical Assistance Grants to States  
(10% of Project Grant)  
Project Grants to communities  
Communities must have FEMA  
approved Flood Mitigation Plan to  
receive Project Funds

## *Eligible Projects*

*(44 CFR Part 78)*

- Elevation of NFIP insured residential structures
- Elevation and dry-proofing of NFIP insured non-residential structures
- Acquisition of NFIP insured structures and underlying real property
- Relocation of NFIP insured structures from acquired or restricted real property to sites not prone to flood hazards
- Demolition of NFIP insured structures on acquired or restricted real property
- Other activities that bring NFIP insured structures into compliance with statutorily authorized floodplain management requirements
- Beach nourishment activities that include planting native dune vegetation and/or the installation of sand-fencing.
- Minor physical mitigation projects that do not duplicate the flood prevention activities of other Federal agencies and lessen the frequency of flooding or severity of flooding and decrease the predicted flood damages in localized flood problem areas. These include: modification of existing culverts and bridges, installation or modification of flood gates, stabilization of stream banks, and

## **PRE-DISASTER MITIGATION PROGRAM (PDM)**

FEMA has long been promoting disaster resistant construction and retrofit of facilities that are vulnerable to hazards in order to reduce potential damages due to a hazard event. The goal is to reduce loss of life, human suffering, economic disruption, and disaster costs to the Federal taxpayer. This has been, and continues to be accomplished, through a variety of programs and grant funds.

Although the overall intent is to reduce vulnerability before the next disaster threatens, the bulk of the funding for such projects actually has been delivered through a "post-disaster" funding mechanism, the Hazard Mitigation Grant Program (HMGP). This program has successfully addressed the many hazard mitigation opportunities uniquely available following a disaster. However, funding of projects "pre-disaster" has been more difficult, particularly in states that have not experienced major disasters in the past decade. In an effort to address "pre-disaster mitigation", FEMA piloted a program from 1997-2001 entitled "Project Impact" that was community based and multi-hazard oriented.

Through the Disaster Mitigation Act of 2000, Congress approved creation of a national Pre-disaster Hazard Mitigation program to provide a funding mechanism that is not dependent on a Presidential disaster declaration. For FY2002, \$25 million has been appropriated for the new grant program entitled the *Pre-Disaster Mitigation Program* (PDM). This new program builds on the experience gained from Project Impact, the HMGP, and other mitigation initiatives.

Here are the high points of the FY 2002 PDM program:

The program will be administered by each State, with a base allocation of \$250,000, and additional funds provided via a population formula.

Eligible projects include:

- State and local hazard mitigation planning
- Technical assistance [e.g. risk assessments, project development]
- Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits
- Minor structural hazard control or protection projects
- Community outreach and education [up to 10% of state allocation]

The emphasis for FY2002 will be on mitigation planning, to help localities meet the new planning requirements of the Disaster Mitigation Act of 2000.

Each state establishes grant selection criteria and priorities based on:

- The State Hazard Mitigation Plan
- The degree of commitment of the community to hazard mitigation
- The cost effectiveness of the proposed project
- The type and degree of hazard being addressed
- For project grants, "good standing" of the community in the National Flood Insurance Program

The funding is 75% Federal share, 25% non-Federal, except as noted below. The grant performance periods will be 18 months for planning grants, and 24 months for mitigation project

grants. The PDM program is available to regional agencies and Indian tribes. Special accommodation will be made for "small and impoverished communities", who will be eligible for 90% Federal share, 10% non-Federal.

## **Disaster Preparedness Improvement Grant (DPIG)**

*FEMA and the State co-sponsor the DPIG Program, which supports the development and updating of disaster assistance plans and capabilities and promotes educational opportunities with respect to preparedness and mitigation. Authority: See Subchapter E. of 44 CFR.*

### **Past DPIG initiatives include:**

- Support of the position of Protection Planner/Hazard Mitigation Officer
- Installation of river gauges
- Support of the NH State Environthon School Program
- Coordinate the Voluntary Organizations Active in Disasters (VOAD) Program (See Resource Profile Annex) NHOEM via the DPIG has sponsored annual meetings with training workshops
- Sponsoring Dam Safety Training initiatives and workshops
- Production and distribution of a handbook for small embankment dam owners
- Inventory of the State's Dams
- Review of Dam Plans
- Sponsored extensive statewide, two day workshops for Granite State Incident Stress Debriefing Teams and funded educational materials
- Community visits and production of informational materials
- Assist with Plan Annex update for local Haz Mat planning.
- Funding workshops for NH Road Agents in cooperation with the T2 program of the Technology Transfer Center at the University of New Hampshire

## ***Disaster Preparedness Improvement Grant***

Evaluate natural hazards on a continuing basis and develop programs and actions required to mitigate such hazards

Provide Technical Assistance Grants to States of up to \$50,000 annually

(50% State match - cash or in kind)

Eligible Projects Include:

Evaluations of Natural Hazards Hazard Mitigation activities (i.e. Plan/ policy/program/strategy development

Plan updates

Handbooks: publication & distribution

Creating exercise materials

Developing Standard Operating Procedures

Training state employees

Report of formal analysis of State enabling legislation and authorities

Update inventory of State/local Critical Facilities

Develop a tracking system of critical actions to be taken post-event

Creating Damage Assessment Plans and defining procedures

Developing Plans for procedures when no Federal Aid is forthcoming

Creating Plans for Search and Rescue Operations

Developing Disaster accounting procedures

This list is not exhaustive

**Present DPIG funded Hazard Mitigation initiatives**

- Support the position of Protection Planner/Hazard Mitigation Officer
- Continued support of the Environthon Program
- Development of this Plan
- Providing Technical Assistance to State and local officials
- Development of Emergency Operations Plans (EOPs) for Significant and High Hazard dams

**Future DPIG funded Hazard Mitigation initiatives**

- Continued Support the position of Protection Planner/Hazard Mitigation Officer
- Continued support of the Environthon Program
- Update and maintenance of this Plan
- Provide Technical Assistance to State and local officials
- Support of other planning, technical assistance and training as indicated
- Digitization of EOPs for the State's "Significant" and "High Hazard" dams to provide rapid access to information in Emergency situations and to facilitate Plan maintenance

## Community Development Block Grant Program

*These Federal funds are provided through the U.S. Department of Housing and Urban Development (HUD) and are administered by the CDBG Program of the New Hampshire Office of State Planning.*

Some CDBG disaster related funding has been transferred to FEMA recently and the SHMO is scheduled to receive guidance as to which specific funds and, new program management criteria.

The specific CDBG funds designated for hazard mitigation purposes are made available to address "unmet needs" pursuant to a given Disaster Declaration to States which request them. For these funds, project selection guidance is provided by NHBEM and NHOEP administers the grant.

Pursuant to Declaration DR-1144-NH, \$557,000.00 was made available to the State and pursuant to DR-1199-NH, the grant award is targeted at \$1,500,000.00.

In October of 1998, HUD announced the program guidelines for the expenditure of the DR-1144-NH related funding and the community of Salem applied for, and has received preliminary approval for funding to acquire a 19-unit trailer park in the Floodplain.

### **Mitigation Programs of Other NH State Agencies**

The following agencies of the State of New Hampshire are directly or indirectly involved in activities that include Hazard Mitigation Planning and/or program implementation.

*NH Department of Transportation Bureau of Repair and Maintenance*

*NH OEP/NFIP Program*

*NH OEP Coastal Program*

*NH DRED Division of Forests and Lands*

*NH DES Water Resources Division – Dam Safety Program*

*NH DES Wetlands Program*

*NH DES Shoreline Protection Program*

### **Community Development Block Grant**

U.S. Dept. of Housing and Urban Development

Funds for a Declared Disaster's "Unmet Needs"

Projects must meet one of three National Objectives

Provide a direct benefit to low and moderate income persons or households

Prevent or eliminate slums and blight

Eliminate conditions which seriously and immediately threaten the public health and welfare

*Additional conditions with respect to the expenditure of these funds includes the provision that at least 50% of the grant award must be expended in a manner which benefits individuals who earn 80% or less than the area's*

## **APPENDIX C**

### **MATRIX OF FEDERAL ALL-HAZARDS GRANTS**

## **APPENDIX D**

### **MEETING DOCUMENTATION**



# Appendix E:

## Risk Assessment Methodology

### Probability

The Committee members completed a risk assessment of all types of hazards identified in Chapter III. The process involved assigned Unlikely (1), Possible (2), Likely (3) to each hazard type for its potential of occurring based on the committee’s knowledge of past historic information. The ratings were based on the probability that the occurrence may happen within the next ten years (3), between 10-25 years (2), or after 25-years (1). (An n/a score was given if there was insufficient evidence to make a decision). To ensure some balance with a more scientific measurement, the plan also identifies the probability of occurrence from the State Hazard Plan as shown below.

State Hazard Plan – *“By weighting both the building value and population, each county is assigned a Vulnerability Level, as seen in Table 4.2 on the next page. In addition you will find Table 4.1 which identifies the hazard risk (probability of occurring) by county. By evaluating the two tables you can compare each county’s vulnerability with it’s’ risk to the 12 different hazards that occur in New Hampshire.*

*In summary, the counties of Hillsborough, Merrimack and Rockingham have a high vulnerability due to large population concentration and high value of state owned buildings as well as high risk of flooding, wildfire, tornadoes/downburst, and severe winter weather.”*

<b>Table 4.1 Hazard Risk by County</b>												
<i>County</i>	<i>Flood</i>	<i>Dam Failure</i>	<i>Drought</i>	<i>Wildfire</i>	<i>Earth quake</i>	<i>Land slide</i>	<i>Radon</i>	<i>Tornado</i>	<i>Hurricane</i>	<i>Lightning</i>	<i>Sever Winter</i>	<i>Avalanche</i>
<i>Sullivan</i>	<i>H</i>	<i>L</i>	<i>M</i>	<i>H</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>H</i>	<i>L</i>
<b>Table 4.2 Hazard Risk Vulnerability by County</b>												
<i>County</i>	<i>Hillsborou gh</i>	<i>Merrimack</i>	<i>Rockingham</i>	<i>Grafton</i>	<i>Stratford</i>	<i>Coos</i>	<i>Belknap</i>	<i>Cheshire</i>	<i>Sullivan</i>	<i>Carroll</i>		
	<i>H</i>	<i>H</i>	<i>H</i>	<i>M</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>L</i>	

### Vulnerability

The Committee members completed a risk assessment of all type of hazards identified in Chapter III. The process also involved assigning vulnerability based on the Committee’s opinion of the extent of damage the hazard may cause based on past occurrences and current assessments of the Town. Great amount of damage and cost (3), moderate amount of damage and cost (2), and limited damage or costs (1).

The probabilities and vulnerabilities were then averaged with those that were determined by the State Hazard Plan.

The averages of each vulnerability and probability were multiplied to arrive at the overall risk the hazard has on the community.

## **Risk**

An adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 25 years.

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

*MEDIUM:* There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be included in the town's emergency management training and exercise program.

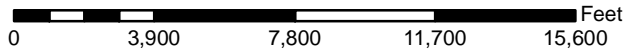
*LOW:* There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

## **Appendix F:**

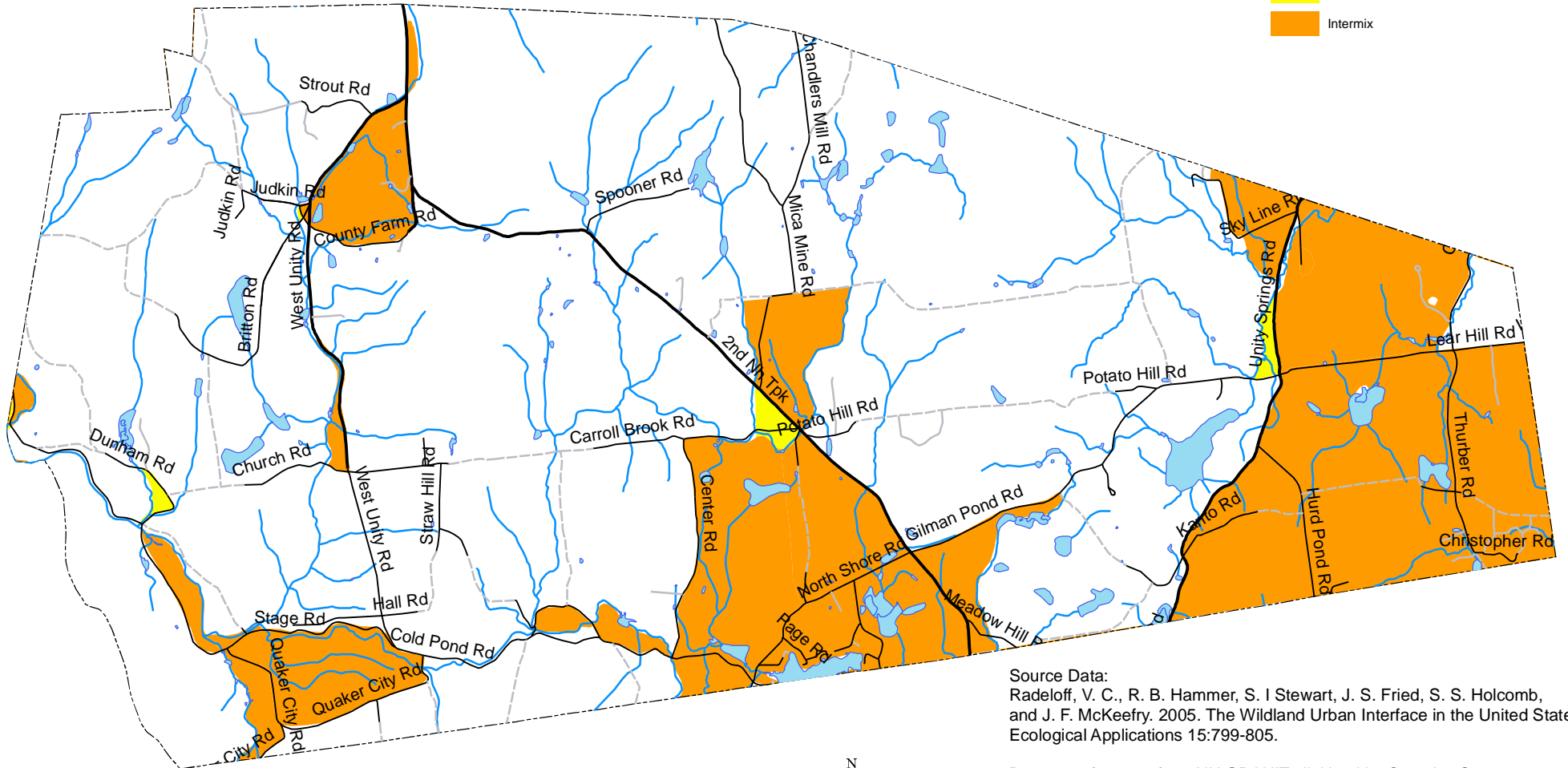
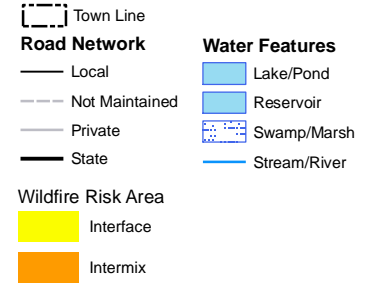
### **Map of Wildfire Risk**

# Town of Unity NH Wildland - Urban Interface Map

1:64,000



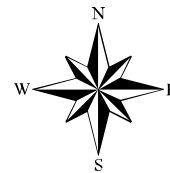
## Legend



Source Data:  
Radeloff, V. C., R. B. Hammer, S. I Stewart, J. S. Fried, S. S. Holcomb,  
and J. F. McKeefry. 2005. The Wildland Urban Interface in the United States.  
Ecological Applications 15:799-805.

Base map features from NH GRANIT, digitized by Complex Systems  
Research Center, UNH.

Disclaimer:  
Digital data in NH GRANIT represent the efforts of the contributing  
agencies to record information from the cited source materials.  
Complex Systems Research Center (CSRC), under contract to the  
Office of Energy and Planning (OEP), and in consultation with  
cooperating agencies, maintains a continuing program to identify  
and correct errors in these data. OEP, CSRC, and the cooperating  
agencies make no claim as to the validity or reliability or to any  
implied uses of these data.



Map created by  
Upper Valley Lake Sunapee Regional Planning Commission,  
November 2007.

**Appendix G:**

**Map of 100-Year Floodplain**

