

Risk Assessments and Hazard Mitigation Strategies for Colebrook

Introduction

What can be done today to lessen the severity of a natural hazard that may strike tomorrow? This is the fundamental question addressed by this report.

In recent years, the Litchfield Hills Region has been hard hit by severe winter storms, high winds, and flooding. These three types of events represent the major natural hazards of concern in the region. All three events can pose a threat to public safety, and the buildings and infrastructure in the regional area. Other natural hazards of concern include drought, forest fires, and earthquakes.

Each town in the Litchfield Hills Region has developed a local emergency operations plan to guide their efforts in contending with these natural disasters with provisions for preparedness, response, and recovery. In 2006, the LHCEO initiated a concerted effort to identify mitigating measures that could lessen the severity of a natural hazard. This effort resulted in the preparation of the "Litchfield Hills Natural Hazard

Mitigation Plan" which was endorsed by FEMA and subsequently adopted by the LHCEO.

This document represents Colebrook's local hazard mitigation actions and challenges and represents part of a regional analysis for Litchfield Hills. This portion of the document provides a town description, an analysis of risks and vulnerabilities, and the municipality's hazard mitigation plan. Also included is a list of hazard mitigation actions and a map illustrating critical facilities and flood zones for Colebrook.

All of the town's individual hazard mitigation reports will be included in the update for the Regional Hazard Mitigation Plan.

TOWN OF COLEBROOK RISK ASSESSMENT AND MITIGATION STRATEGY

General Town Description

The Town of Colebrook is a rural, residential located along the northern border of the Litchfield Hills Region. It is bordered on the east by Hartland, on the south by Winchester, on the west by Norfolk, and on the north by Massachusetts (see Figure 1).

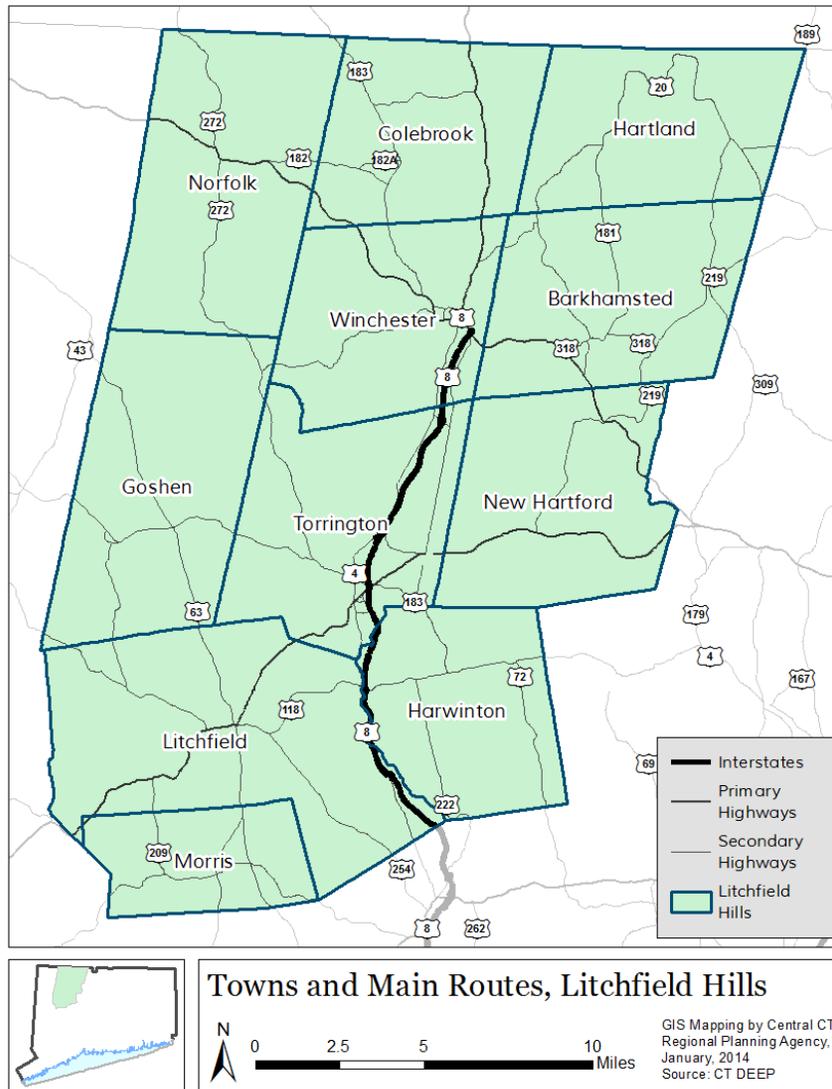


Figure 1

Colebrook was incorporated in October of 1779 and has a total area of 32.9 square miles with a land area of 31.5 square miles. It has a population of 1,479 persons in 2011, and is run by a Selectman/Town Meeting form of government.

Colebrook is part of the Northwest Highlands Ecoregion, and is characterized by a hilly and forested landscape, numerous brooks and streams, Colebrook River Reservoir, Goodwin Dam Reservoir, Algonquin State Forest, and the quintessential New England village of Colebrook Center. Major highways serving the town include State Routes 44, 8, 182, 182A, and 183. The bedrock is primarily metamorphic and granite, and the surficial material consists predominantly of fertile, stony glacial till soils. Colebrook has a rich history of iron forges, lumbering, agriculture, and cotton mills during the 18th and 19th centuries.

The floods of 1927, 1938, and 1955 impacted Colebrook as they did other towns in the Litchfield Hills Region. Town historian Robert Grigg has compiled vivid descriptions by residents of each of these storm events and their deadly and destructive impact on local residents.

The Metropolitan District Commission, established to provide water and other services to towns in the Greater Hartford area, began purchasing land in the eastern

section of Colebrook in the 1930's. This ultimately led to the construction of the Goodwin Dam (originally known as the "Hogback Dam") in Hartland and the creation of the West Branch Reservoir in 1960 in order to augment the MDC's source of water supply.

Another major dam, the Colebrook River Dam, which is located about 2 miles upstream from the Goodwin Dam, was completed in 1969 by the U.S. Army Corps of Engineers. The Army Corps cited the damage caused by the 1938 and 1955 floods as the reason that this structure was necessary for flood control purposes. This Colebrook River Dam created the Colebrook River Reservoir, which is about double the size of the Goodwin Reservoir and has a maximum water surface area of 1,210 acres. The historic village of Colebrook River, with over 100 dwellings and commercial structures, was inundated with the creation of this new reservoir.

The population of Colebrook has increased an average of 14 persons per year over the past 50 years, from a population of 791 people in 1960 to 1,485 in 2010. The population is projected to decrease to 1,464 persons by the year 2016, a decrease of -0.2%. The median age in 2011 is 46. Most housing is owner occupied, with about 12% of the housing stock held for seasonal, recreational or occasional use (second homes). There are 698 existing housing units in town as of 2009.

Colebrook has a resident labor force of 802 persons in 2011, with 120 jobs located in town. Most of these jobs are in service producing industries. The unemployment rate is 5% in 2011.

According to the CT Economic Resource Center, Colebrook has an equalized net grand list of \$218,508,765 in 2008 with commercial and industrial uses comprising 1.1% of this grand list. The equalized net grand list is an estimate of the market value of all taxable property in the municipality, and gives some indication of the value of property at risk in the event of a major natural disaster. There are 30 business firms in the community according to CERC as of 2011.

Evaluation of Risks and Vulnerability

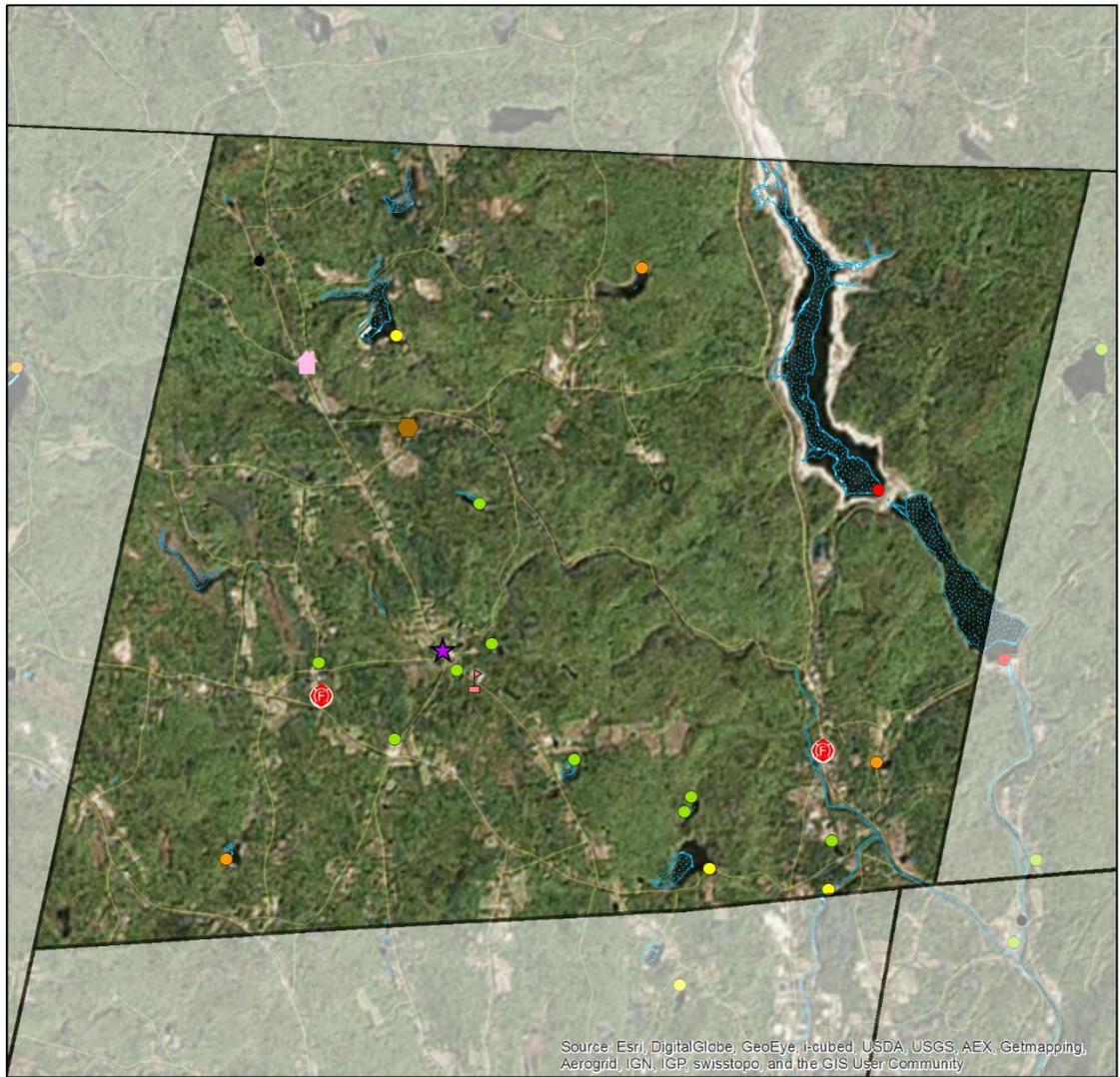
The major natural hazards of concern in Colebrook are flooding, high winds, and severe winter storms. Forest fires, drought, and earthquakes occur much less frequently in the community, and are therefore of somewhat lesser concern. The general risk and vulnerability posed by each of these six hazards is discussed in the preceding Section III of this report. More specific information on the flood vulnerability and critical facilities in the town of Colebrook is presented below. .

Floodprone areas in Colebrook, as mapped by FEMA, are shown in Figure 2. The hazard of flooding has been greatly reduced in the community through the construction of the Colebrook River Dam and the Goodwin Dam. According to FEMA's webpage, eleven (11) flood insurance policies are in force as of 2/28/2014 with an insurance value of \$2,578,900. An attempt was made to estimate the number of structures located within the FEMA floodplain boundaries using available GIS data for Connecticut, however the data is not considered precise enough for an accurate assessment. Colebrook's First Selectman stated in a 2014 interview that the lower end of Sandy Brook near Riverton Road is the most floodprone area in town and that basement pump-outs are common during major storm events.

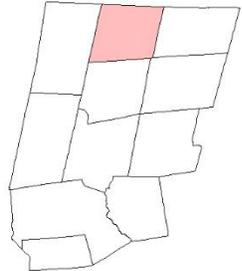
There are sixteen dams in Colebrook. All of these dams are private dams with the exception of the Colebrook River Dam and the town-owned Metro Dam located at the Town Pond in Colebrook Center. The Colebrook River Dam is rated as Hazard Type C. Of the remaining dams, six are rated B or BB, and nine dams are rated A. For a description of these dam ratings, see page 30 of this report.

The major facilities at risk in the community in the event of a natural hazard are shown in Figure 2. These facilities include the Colebrook Town Hall, Colebrook Elementary School, the Town Garage, Center Fire House, Forge Fire

House, Camp Jewell (back-up shelter), and Colebrook hydro facility retro-fit.. These are considered critical facilities in the event of a natural disaster because they might be at risk or needed for effective emergency response. All are potentially vulnerable to tornados, winter storms, wildfire, and earthquakes. None of the facilities are located within a floodplain.



Flood Zones, Dams & Critical Facilities Colebrook



Flood Zones

- 100 Year Flood
- 500 Year Flood

Critical Facilities / Dam Hazards

- Town Hall
- Police Station
- Hospital
- Ambulance
- School
- Fire Department
- Water Treatment Facility
- Public Works & Municipal
- Repetitive Loss Properties
- Shelters and Community Centers
- Unknown
- C
- BB
- B
- A
- AA

GIS Mapping by Central CT
Regional Planning Agency
June 2014
Source: CT DEEP



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 2 Repetitive Loss Property locations represents general location.

3. Hazard Mitigation Plan

Mitigation Goals and Objectives

The principal goals of Colebrook's natural hazard mitigation plan are:

1. To minimize the risks to life and property from natural hazards, and
2. To prevent losses from natural hazards to the extent practicable

In addition to these over-arching goals, the town has also established the following objectives to help the town become more disaster resistant:

- 1: Educate the public regarding natural hazards of concern, mitigation activities, and community preparedness
2. Ensure proper functioning of critical facilities during emergency response.
3. Expand maintenance activities and implement specific projects that address known drainage issues within the town.

Potential Mitigation Measures

Table 4.B in the previous section of this report presents a listing of potential mitigation measures that can be taken to reduce the impacts of the major natural hazards of concern in the Litchfield Hills Region. In the context of Colebrook's risk and vulnerability analysis presented above, and the existing mitigation strategies in the town,

only some of these measures will be both needed and cost-effective. The purpose of this Natural Hazards Mitigation Plan is to identify reasonable and appropriate mitigation measures for each hazard from the Table 4.B listing and other sources, and to develop an implementation strategy for the priority mitigation measures.

Existing Mitigation Strategies

The Town of Colebrook has a number of existing programs and regulations that serve to mitigate the impact of natural hazards. Land use regulations exist to protect natural resources, including erosion and sediment control regulations for new development, stormwater control regulations to minimize drainage problems, and a flood hazard area overlay district to control development in flood prone areas.

The flood hazard area overlay district provides that any new construction or substantial improvement of any residential structure shall have the lowest floor, including the basement, elevated to at least one foot above the base flood elevation. Nonresidential construction is required to have the lowest floor, including basement, elevated to at least one foot above the base flood level or be flood-proofed to one foot above the base flood elevation. A registered professional engineer or architect is required to design and certify the construction of structures in the floodplain in order to minimize flood damage. Additionally

all attendant utilities or sanitary facilities should be located or designed to avoid infiltration or impairment by flood waters. Manufactured homes and recreational vehicles are prohibited or highly restricted within the flood hazard overlay district, respectively.

Colebrook's Subdivision regulations have detailed standards for the planning, design and construction of storm drainage systems in order to minimize adverse impacts with new construction activity. The Colebrook Inland Wetlands and Watercourses Agency enforces regulations to direct development away from wetlands and floodplains. These regulations also encourage development and subdivision to implement low impact development strategies to manage stormwaters and drainage.

In addition to these regulations, the Colebrook Public Works Department routinely examines and clears public storm drains and catch basins of debris following periods of rainfall, snowfall, or windstorms. The town's DPW also monitors weather reports and maintains loaded trucks in preparation of winter storm events.

The Colebrook Volunteer Fire Department, Department of Public Works, and Emergency management Director all possesses emergency equipment that can be deployed as needed in the event of an emergency. Procedures are also

in place to open and maintain the Emergency Operations Center and Emergency Shelter in town. Recently, the town purchased a generator for the Town Hall and Senior Center for back-up power during an emergency. Colebrook has also been working with other towns in the Litchfield Hills Region through the Northwest Hills Public Safety Task Force to enhance communication and coordination. This has included efforts to standardize communication equipment and the equipment in local emergency operation centers, and also the upgrading of supplies at emergency shelters. Other activities that have been implemented include participation in a regionally coordinated public notification system, a badging registration system for emergency responders, and improved training opportunities.

In addition to these local and regional mitigation programs, the municipality also benefits from numerous federal and state mitigation programs such as the "Automated Flood Warning System", the "Connecticut Drought Preparedness and Response Plan", the "National Weather Service Early Warning System", and the annual tree trimming maintenance program by Northeast Utilities.

Recommended Hazard Mitigation Measures

Objective 1: Educate the public regarding natural hazards of concern, mitigation activities, and community preparedness.
Natural Hazard Addressed: All hazards.

Strategies	Who	When	Priority
1. Visit schools and educate children about natural hazards and how to prepare for them.	Volunteer Fire Dept. and Emergency Management Director	Annually	Medium
2. Make literature available on natural hazards and preparedness at Goshen Town Hall.	Emergency Management Director and First Selectman	On-going	High
3. Provide outreach to seasonal home-owners on how to protect against frozen pipes and water damage during the winter with the loss of electricity, including information on automatic shut-off switches or alarms.	Emergency Management Director and First Selectman	2014	Medium
4. Maintain local Emergency Operations Plan and continue to coordinate with the Regional Public Safety Task Force and DEMHS Region 5 on planning, preparedness, response, and training.	Emergency Management Director and First Selectman	On-going	Medium
5. Continue to provide an Emergency Notification System to provide emergency information to residents in the town or in a specific geographic area. This System can warn of an impending situation and also provide information regarding how to prepare or respond to a particular event.	Emergency Management Director and First Selectman	On-going	Medium

Objective 2: Ensure proper functioning of critical facilities during emergency response. *Natural Hazard Addressed: All hazards.*

Strategies	Who	When	Priority
1. Routinely inspect emergency response equipment, and train for response to natural disasters.	Volunteer Fire Dept., CERT Team, and Emergency Management Director	On-going	High
2. Acquire additional emergency response equipment including a wood chipper and 500-gallon portable water tank to enhance response capabilities	Emergency Management Director, Fire Chief	On-going	High
3. Promote the use of interoperable communication equipment, and the development of standard operating guidelines for emergency response in the regional area.	Emergency Management Director, Fire Chief, and First Selectman	On-going	High
4. Consider developing a Memorandum of Understanding with schools to utilize school buses for mass transportation during an emergency.	Emergency Management Director and First Selectman	2015	Moderate
5. Develop basic GIS capabilities as needed for access to aerial photos showing the number and location of properties and structures that could be affected by a natural disaster.	Emergency Management Director, Fire Chief, and First Selectman	2015	Moderate

Objective 3: Expand maintenance activities and implement specific projects that address known drainage issues within the town. *Natural Hazard Addressed: flooding*

Strategies	Who	When	Priority
1. Pursue funding to implement control measures to mitigate the flooding created by beavers.	Public Works Dept.	On-going	Medium
2. Develop clean-out schedules for all catch basins and drainage facilities	Public Works Dept.	Annually	Medium

3. Review floodplain regulations and update as necessary based on guidance from DEEP.	Planning and Zoning Commission	Annually	Medium
4. Pursue improved floodplain mapping in cooperation with federal and state authorities in order to more accurately identify the location of structures that are susceptible to flooding.	FEMA , DEEP, Selectman, EMD	First On-going	Medium
5. Pursue additional funding to supplement the municipal tree trimming program.	First Selectman, Works Dept.	Public 2014	Medium
6. Pursue the purchase and placement of standardized house number signs to facilitate effective emergency response to 911 calls	Emergency Management Director, Fire Chief, and First Selectman	2014	Medium
7. Undertake comprehensive stormwater drainage study at Woodridge Lake to address localized flooding problems	First Selectman, Works Dept.	Public 2014	Moderate

The priority assigned to the above strategies was based on cost-benefit discussions with local officials, and an evaluation using the STAPLEE criteria defined in FEMA's "How-To Guide #3: Developing the Mitigation Plan". STAPLEE is short for the social, technical, administrative, political, legal, economic, and environmental criteria used in the evaluation process. It is anticipated that the low-cost strategies will be implemented during the first year after plan adoption. The higher-cost projects will be implemented as funding becomes available.