



Western Connecticut Council of Governments Multi-Jurisdiction Hazard Mitigation Plan Update 2021 – 2026

Municipal Annex for **Sherman**

Mallory Town Hall
9 Route 39 North — P.O. Box 39
Sherman, CT
August 2021
MMI #3101-22

Prepared for:
WESTERN CONNECTICUT
COUNCIL OF GOVERNMENTS
1 Riverside Road
Sandy Hook, CT 06482
475-323-2060
www.westcog.org

Prepared by:
MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773
www.mminc.com



MILONE & MACBROOM

ENGINEERING | PLANNING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL SCIENCE

TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Purpose of Annex	4
2.0	COMMUNITY PROFILE	5
2.1	Geography	5
2.1.1	Physical Setting.....	5
2.1.2	Land Use.....	7
2.1.3	Climate and Climate Change	7
2.1.4	Drainage Basins and Hydrology	9
2.2	Society, Culture, and Government	11
2.2.1	Population and Demographic Setting.....	11
2.2.2	Development Trends	12
2.2.3	Governmental Structure	13
2.2.4	Historic and Cultural Resources.....	13
2.3	Infrastructure.....	15
2.3.1	Transportation.....	15
2.3.2	Utilities	15
2.4	Planning and Regulatory Capabilities.....	15
2.4.1	Review of Existing Local Plans.....	15
2.4.2	Review of Regulatory Structures	16
2.5	Emergency Services, Critical Facilities, Sheltering, and Evacuation.....	16
3.0	HAZARD ASSESSMENT	23
3.1	FLOODING (COASTAL, INLAND, AND ICE JAMS)	23
3.1.1	Setting.....	23
3.1.2	Capabilities	23
3.1.3	Vulnerabilities and Risk Assessment	27
3.2	DAM FAILURE	30
3.2.1	Setting.....	30
3.2.2	Capabilities	30

3.2.3	Vulnerabilities and Risk Assessment	32
3.3	HURRICANES AND TROPICAL STORMS.....	34
3.3.1	Setting.....	34
3.3.2	Capabilities	35
3.3.3	Vulnerabilities and Risk Assessment	36
3.4	SUMMER STORMS AND TORNADOES.....	38
3.4.1	Setting.....	38
3.4.2	Capabilities	38
3.4.3	Vulnerabilities and Risk Assessment	40
3.5	WINTER STORMS AND NOR'EASTERS	41
3.5.1	Setting.....	41
3.5.2	Capabilities	41
3.5.3	Vulnerabilities and Risk Assessment	42
3.6	WILDFIRES AND DROUGHT.....	43
3.6.1	Setting.....	43
3.6.2	Capabilities	44
3.6.3	Vulnerabilities and Risk Assessment	45
3.7	EARTHQUAKES AND LANDSLIDES.....	48
3.7.1	Setting.....	48
3.7.2	Capabilities	48
3.7.3	Vulnerabilities and Risk Assessment	49
4.0	MITIGATION STRATEGIES AND ACTIONS	51
4.1	Goals and Objectives	51
4.2	Status of Mitigation Strategies and Actions from Previous HMP.....	51
4.3	Prioritization of Strategies and Actions.....	58
4.4	Mitigation Strategies and Actions Implementation Table.....	58

LIST OF FIGURES

Figure 2-1: Location Map.....	6
Figure 2-2: The CDC SVI Index Factors. Graphic: svi.cdc.com.....	11
Figure 2-3: Historic Resources	14
Figure 2-4: Critical Facilities Map	18
Figure 3-1: USDM Drought Time Series for Fairfield County.....	44
Figure 3-2: Wildfire Risk Areas.....	47

LIST OF TABLES

Table 2-1: Land Cove by Area	5
Table 2-2: 24-Hour Rainfall Amounts by Annual-Chance Occurrence.....	8
Table 2-3: Subregional Drainage Basins.....	9
Table 2-4: Private Associations Within the Town of Sherman.....	12
Table 2-5: Number of Historic Assets Exposed to Different Hazards in Sherman	13
Table 2-6: Critical Facilities in Sherman	17
Table 3-1: Dead-End Roads in Sherman That Span a Mapped Watercourse	28
Table 3-2: Dams Registered With the DEEP in the Town of Sherman.....	32
Table 3-3: Probability of a Damaging Earthquake in the Vicinity of Sherman	50

LIST OF APPENDICES

Appendix A: STAPLEE Matrix
Appendix B: SVI Summary

1.0 INTRODUCTION

1.1 Purpose of Annex

The purpose of this Hazard Mitigation Plan (HMP) annex is to provide a community-specific hazard risk assessment, capability analysis, and evaluation and prioritization of hazard mitigation measures and projects. Background information and the regional effects of pertinent natural hazards are discussed in the main body of the Western Connecticut Council of Governments (WestCOG) Multi-Jurisdictional Hazard Mitigation Plan. This annex is designed to supplement the information presented in the Multi-Jurisdictional HMP with more specific detail for the Town of Sherman and is not to be considered a standalone document.

The primary goal of this HMP, including this Municipal Annex, is to identify natural hazard risks and mitigation opportunities in order to reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources. This includes the reduction of public and private damage costs. Limiting losses of and damage to life and property will also reduce the social, emotional, and economic disruption associated with a natural disaster.

2.0 COMMUNITY PROFILE

2.1 Geography

2.1.1 Physical Setting

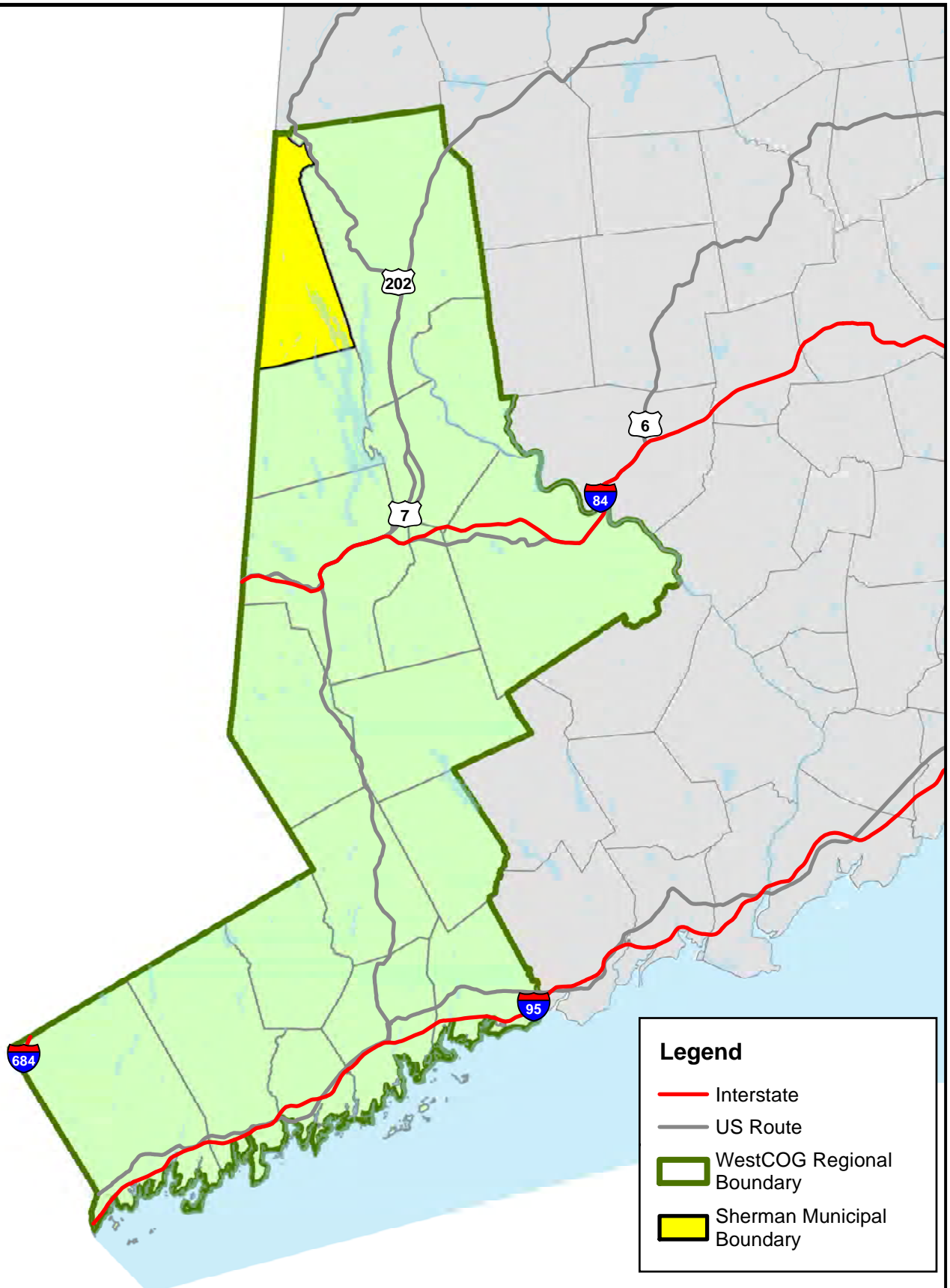
The town of Sherman is located in northern Fairfield County along the New York state border. Sherman is bordered by the Connecticut municipalities of Kent to the north, New Milford to the east, and to the south by New Fairfield. It is bordered to the west (from north to south) by the municipalities of Dover, Pawling, and Patterson, New York. Refer to Figure 2-1 for a map showing the location of Sherman.

Sherman is located in the Western Highlands of Connecticut. The topography of the Town is characterized by a narrow central valley bounded to the west and east by a series of high hills and mountains broken by narrow stream valleys. Peaks in the southwestern part of town reach elevations nearing 1,300 feet above sea level. An arm of Candlewood Lake extends from the New Fairfield border about three miles into Sherman. The central valley surrounding the lake contains productive agricultural soils. The varying terrain of Sherman makes the town vulnerable to an array of natural hazards. Sherman does not include any coastline or tidally influenced watercourses, removing hazards from storm surges or predicted sea level rise.

The Center for Land Use Education and Research (CLEAR) has developed a land cover dataset derived from 2016 satellite imagery to depict statewide land cover. The land cover by percent of total land can be found in Table 2-1.

Table 2-1: Land Cove by Area

Land Cover Class	Percent of Total Land
Developed	9.6%
Turf & Grass	4.4%
Other Grasses	0.6%
Agricultural Field	8.5%
Deciduous Forest	60.9%
Coniferous Forest	5.7%
Water	7.9%
Non-Forested Wetland	0.03%
Forested Wetland	2.3
Tidal Wetland	0.0%
Barren Land	0.03%
Utility Corridor	0.01%

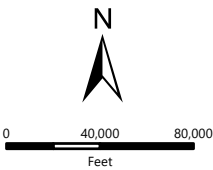


Legend

- Interstate
- US Route
- WestCOG Regional Boundary
- Sherman Municipal Boundary

MILONE & MACBROOM
 99 REALTY DRIVE
 CHESHIRE, CT 06410
 203.271.1773
 WWW.MMINC.COM

Regional Location of Sherman
 WestCOG Hazard Mitigation Plan
 Town of Sherman



SCALE	1" = 82,167'
DATE	11/12/2020
PROJ. NO.	3101-22

FIG. 2-1

2.1.2 Land Use

Sherman encompasses approximately 23.4 square miles. It is a rural municipality characterized by low population density, active agricultural uses, and very limited commercial development. The need for on-site water supply and septic disposal limits density throughout the community.

In general, low-density residential uses are located around Candlewood Lake and low-density residential and agricultural uses are located along the major transportation corridors through Town, namely State Routes 37, 39, and 55. A small Town Center with limited commercial, municipal, and institutional land uses is located just north of Candlewood Lake at the junction of Routes 37 and 39. The southwestern and far northern parts of Sherman are predominantly forested. Agricultural and residential uses are interspersed through the central part of the community.

Conservation measures have set aside a large percentage of the Town as open space. The local Naromi Land Trust, the only agency of the Town specifically chartered for the purpose of owning open space lands, conservation easements, agricultural easements, and similar assets, was formed in 1968. The Town also created the Land Acquisition Fund to fund purchases of open space using tax dollars and bonds. The first land purchase was four acres in the Town Center called "Manch Meadow."

The trust successfully obtained title to 850 acres and permanent conservation restrictions on an additional 150 acres throughout Sherman by 1990. Protected lands included active farmland, fields, forest, subdivision open space, trail land, and wildlife preserve. In 1980, a group of local residents successfully obtained title to a tract of land in the northern part of Town that was subsequently transferred to the National Park Service as a wilderness preserve for the relocation of the Appalachian Trail. Recently, the Town bought a 100-acre farm on Farm Road to preserve as open space.

2.1.3 Climate and Climate Change

Over the course of the year, the temperature in Sherman typically varies from 17°F to 81°F and is rarely below 2°F or above 89°F. The warm season lasts from May 29 to September 15, with an average daily high temperature above 72°F. The hottest day of the year is July 20, with an average high of 81°F and low of 62°F. The cold season lasts from December 1 to March 10, with an average daily high temperature below 43°F. The coldest day of the year is January 29, with an average low of 17°F and high of 33°F.

Precipitation falls throughout the year in Sherman. The wetter season lasts from April 9 to August 21, with a greater than 30% chance of a given day being a wet day. The chance of a wet day peaks at 38% on May 29. The smallest chance of a wet day is 22% on January 29.

The most rain falls during the 31 days centered around June 4, with an average total accumulation of 3.9 inches. The least rain falls around January 24, with an average total accumulation of 1.4 inches.

The snowy period of the year lasts from October 26 to April 17, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 24, with an average total liquid-equivalent accumulation of 1.3 inches.

Climate data was sourced from Weather Spark based on analysis of the years 1980 to 2016.

Climate Change

Climate change projections for Connecticut were sourced from the 2019 Connecticut Physical Climate Science Assessment Report, which was developed by the University of Connecticut (UConn) Atmospheric Sciences Group, commissioned by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) with funding from the Department of Energy and Environmental Protection (DEEP). All projections are based on the IPCC high CO₂ emission scenario (RCP8.5).

Temperature

Annual temperatures have been increasing throughout Connecticut and is projected to continue to do so in the future. By mid-century, average annual temperature is projected to increase by 5°F. Seasonal average temperatures are also expected to rise, with the greatest increase (6°F) experienced in summer (June to August). The number of nights over which temperature remains above 68°F will quadruple from 10 days per year to more than 40 days, and the number of extremely hot days will increase from above 4 a year to 48 per year.

Precipitation

Rainfall data in "Technical Paper No. 40" by the U.S. Weather Bureau (now the National Weather Service) (Hershfield, 1961) dates from the years 1938 through 1958. According to these data, the 24-hour rainfall amount for a 50-percent-annual-chance storm in Fairfield County is 3.3 inches.

The continued increase in precipitation only heightens the need for hazard mitigation planning as the occurrence of floods may change in accordance with the greater precipitation.

The Northeast Regional Climate Center (NRCC) has partnered with the Natural Resources Conservation Service (NRCS) to provide a consistent, current regional analysis of rainfall extremes (<http://precip.eas.cornell.edu/>). In 2020 this dataset listed the 24-hour rainfall amount for a 50-percent-annual-chance storm in Sherman as 3.28 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 50-percent-chance annual storm in Sherman at 3.42 inches.

These precipitation amounts, and more details, are summarized in Table 2-2, below.

Table 2-2: 24-Hour Rainfall Amounts by Annual-Chance Occurrence

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	50%	4%	1%
Technical Paper No. 40	3.3	5.7	7.2
NRCC	3.28	6.14	8.67
NOAA Atlas 14	3.42	6.67	8.59

Annual precipitation has been increasing statewide and is projected to continue to increase. By mid-century, annual precipitation is projected to increase by 8.5%, with the greatest increase (13.4%) occurring in the winter months. Extreme precipitation events are projected to increase in both frequency and magnitude. Based on this increase and the precipitation figures above, by 2050 Sherman can expect the 24-hour rainfall amount for a 50% annual-chance storm to be more than 3.6 inches.

Despite overall increases in precipitation, drought risk is projected to increase, especially during summer, due to changing precipitation patterns and projected increases in potential evapotranspiration (plants taking up more water in hotter temperatures and longer growing seasons).

2.1.4 Drainage Basins and Hydrology

Sherman is divided among seven subregional watersheds as shown in Table 2-3. The majority of the drainage basins drain back to the Housatonic River. Streams in the northern part of town flow into the Housatonic River directly via the Tenmile River and/or its tributary, Deuel Hollow Brook, or via Naromiyocknowhusunkatankshunk Brook (formerly known as Morrissey Brook, abbreviated as "Naromi" for this document). Streams in the central and southern areas of town either drain directly into Candlewood Lake or its tributary Saw Mill Brook. The southwestern corner of town drains to Quaker Brook, which flows eventually to the Hudson River in New York State.

Table 2-3: Subregional Drainage Basins

Drainage Basin	Area (sq. mi)	Percent of Town
Candlewood Lake	7.78	33.3%
Housatonic River	4.52	19.3%
Naromi Brook	4.12	17.6%
Sawmill Brook	3.74	16.0%
Quaker Brook	2.54	10.9%
Deuel Hollow Brook	0.47	2.0%
Tenmile River	0.22	0.9%
Total	23.39	100.0%

Source: Connecticut Department of Environmental Protection GIS Data

Housatonic River

The Housatonic River forms approximately 2.1 linear miles of Sherman's boundary with the town of New Milford. The watershed for the Housatonic River and its tributaries covers 89% of the land area of Sherman. About 19% of Sherman drains directly to the river, with these areas being primarily in the northern and eastern sections of town. The Tenmile River is one of the Housatonic River's major tributaries, and it joins the Housatonic River along Sherman's northern border with the town of Kent. The entire length of the Housatonic River in Sherman has 100-year floodplains defined with elevations.

Candlewood Lake

The Candlewood Lake watershed comprises one-third of the town's land area. Several small streams such as Glen Brook, Greenwood Brook, and Tollgate Brook drain directly to Candlewood

Lake. In addition, Sawmill Brook and its watershed area drain to the lake within Sherman. There is a delineated 100-year floodplain surrounding the lake without elevations defined.

Naromiyocknowhusunkatankshunk Brook

This brook was formerly known as Morrissey Brook until it was officially renamed by the Connecticut General Assembly in 2001. It flows northward through central Sherman to join the Housatonic River in neighboring New Milford. The watershed covers about 17% of the town, primarily in the central area. The headwaters of this stream begin west of Sherman in Pawling, New York. The entire stream has a delineated 100-year floodplain without elevations defined.

Sawmill Brook

This brook, which is also locally known as Great Brook, flows into Candlewood Lake after draining a portion of central Sherman and a small area of Pawling, New York. The Saw Mill Brook drainage basin covers about 16% of Sherman's land area. This stream is very flashy, and nearby infrastructure has experienced damage during flooding events, particularly the extreme floods that occurred in 1999 and 2007. The entire stream has a delineated 100-year floodplain without elevations defined.

Quaker Brook

Quaker Brook is the only subregional watershed in Sherman that does not drain to the Housatonic River. The headwaters of the brook begin in southeastern Dutchess County, New York. The brook loops through southwestern Sherman, passing through Timber Lake, Squantz Pond, and Valley Pond before passing southwest into New Fairfield. Quaker Brook then flows southwest through New Fairfield and then west into Patterson, New York. It eventually joins the East Branch of the Croton River and then the Croton Reservoir, which serves New York City as a public water supply source. Approximately 11% of the land area in Sherman drains to this brook in the southwestern portion of town. The entire stream has a delineated 100-year floodplain without elevations defined.

Deuel Hollow Brook

Deuel Hollow Brook is a tributary of the Tenmile River. Only a small portion of Sherman's land area (2%) in northwestern Sherman flows west to this brook, the channel of which is located in Pawling and Dover, New York.

Tenmile River

The Tenmile River flows south through Dutchess County, New York, joining the Housatonic River at Sherman's northern town boundary. It is a primary tributary to the Housatonic River. A very small portion of its 210 square mile watershed is located in northern Sherman, covering approximately 1% of the town's land area. The Tenmile River has a 100-year floodplain with defined elevations along the northern boundary of Sherman.

2.2 Society, Culture, and Government

2.2.1 Population and Demographic Setting

Sherman had a population of 3,581 people, or 153 persons per square mile, in 2010, according to the decennial U.S. Census. According to the 2018 American Community Survey five-year estimates, Sherman's population between 2013 and 2018 was approximately 3,641. The Connecticut State Data Center predicts that population in Sherman will decrease in the future, with the population in 2040 projected to be 1,803. Future changes in Sherman's population will likely be relatively minor and gradual, are not expected to lead to significant development in hazardous areas, and are not expected to change the hazard profile for the Town. Most residents of Sherman live in the southern half of the town, particularly in the vicinity of Candlewood Lake.

One important aspect of natural hazard mitigation planning is to identify a community's demographic trends in relation to natural hazards. The Center for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) is used to identify vulnerable populations in Sherman. The SVI uses census data to identify populations within the town that may be more vulnerable to natural hazards. As a result of this analysis, the town is identified to have a certain level of overall social vulnerability with a rank of 0 to 1; 1 being the most vulnerable and 0 being the least.

To determine social vulnerability, the CDC incorporates 15 factors into the overall SVI calculation under four categories, or themes: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation. Figure 2-2 represents the breakdown of the SVI process. These themes and their ranking are based on census statistics. By evaluating these factors and determining a level of social vulnerability, a community can identify specific needs for before, during, and after an event. Such needs may include sheltering capacity, evacuation routes, or to decide how many emergency personnel may be required to respond after an event.

The Town of Sherman is considered to have a low level of vulnerability, with their most vulnerable social aspect being the household composition and disability. Appendix B explores the SVI for Sherman in more depth.

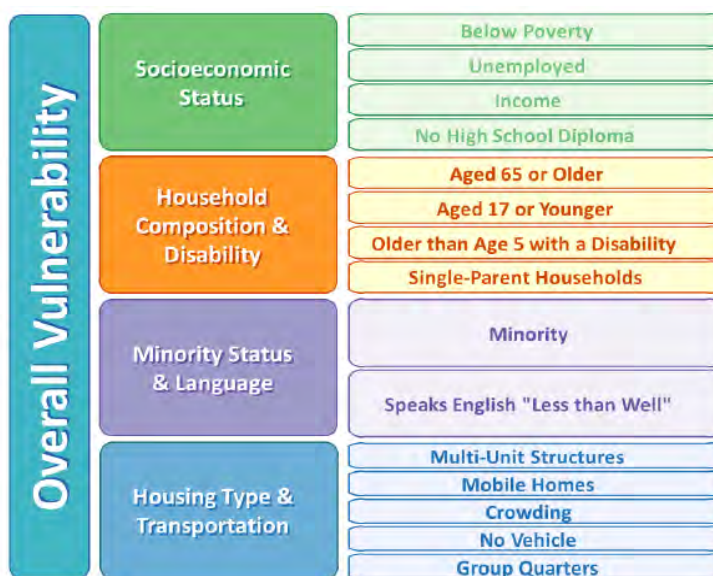


Figure 2-2: The CDC SVI Index Factors. Graphic:
svi.cdc.com

Elderly, linguistically isolated, and disabled populations have numerous implications for hazard mitigation as they may require special assistance or different means of notification before and during natural hazards.

2.2.2 Development Trends

Development in Sherman has slowed over the last decade, leading to a limited increase in vulnerability to hazards.

Population growth in Sherman was strong from 1990 to 2000 and development increasingly extended throughout the community at a rate of approximately 40 new homes per year. According to the CT Department of Economic and Community Development, 104 housing units were added to the community's housing stock between 2000 and 2009. Most newer development is in the northern end of town, but the most concentrated development remains around Candlewood Lake.

Sherman remains a rural community with little commercial and industrial development. The lack of public sewer and water services severely limits the potential for dense development anywhere in the community. Approximately 20% of the houses in Sherman are second homes used for vacation and recreation purposes by owners who live, and earn their living, elsewhere.

There has been no significant new development in Sherman since 2017, and the Town does not project any significant new development in the next five years. A development surrounding the Club at River Oaks golf course in the north end of town near the Housatonic River has 62 lots approved, but only a portion have been built. Town personnel also note that much of the undeveloped 400 acres within the Timber Trails Association in the southwestern part of town is potentially developable and lies within the Quaker Brook watershed that drains to the New York City water supply reservoirs. The minimal pace of development in Sherman is not expected to increase any specific risks to hazards.

Numerous homeowner and residential associations exist within the town. Many of these associations are charged with paying for projects such as road maintenance within their boundaries. Table 2-4 presents the list of private communities in Sherman.

Table 2-4: Private Associations Within the Town of Sherman

Association Name	Area
Holiday Point Association	Candlewood Lake
Atchinson Cove Tax District	Candlewood Lake
Candlewood Lake Estates	Candlewood Lake
Deer Run Shores	Candlewood Lake
Orchard Rest Association	Candlewood Lake
Deer Hill Association	Candlewood Lake
Pinewood Shores Association	Candlewood Lake
Candlewood Echoes Association	Candlewood Lake
Pleasant View Road Association	Candlewood Lake
Mill Pond Farm	Candlewood Lake
Sail Harbor	Candlewood Lake
Mauweehoo Lake Association	Lake Mauweehoo
Timber Trails Association	Southwestern Sherman

2.2.3 Governmental Structure

The Town of Sherman is governed by a Board of Selectmen – Town Meeting form of government in which legislative responsibilities are shared by the Board of Selectmen and the Town Meeting. The First Selectman serves as the chief executive.

In addition to Board of Selectmen and the Town Meeting, there are boards, commissions and committees providing input and direction to Town administrators. Also, Town departments provide municipal services and day-to-day administration. Many of these commissions and departments play a role in hazard mitigation, including the Building Department, Fire Marshal, Office of Emergency Management, Planning and Zoning, Public Works, Tree Warden, Conservation Commission, Inland Wetlands Commission, and Land Acquisition Board.

2.2.4 Historic and Cultural Resources

Historic and cultural resources include sites, structures, and objects that are significant in history, architecture, archaeology, engineering, and culture. Protection of these resources grows economies and enhances community character, and following a natural disaster they can help to reinforce neighborhood connections and reestablish a sense of community and normalcy. Consideration of these resources in this HMP is critical.

Historic preservation planning helps protect historic properties and cultural resources from demolition or alteration.

Hazard mitigation planning helps protect life and property from damage caused by natural and manmade hazards.

Integrating these two planning processes helps create safe and sustainable historic communities.

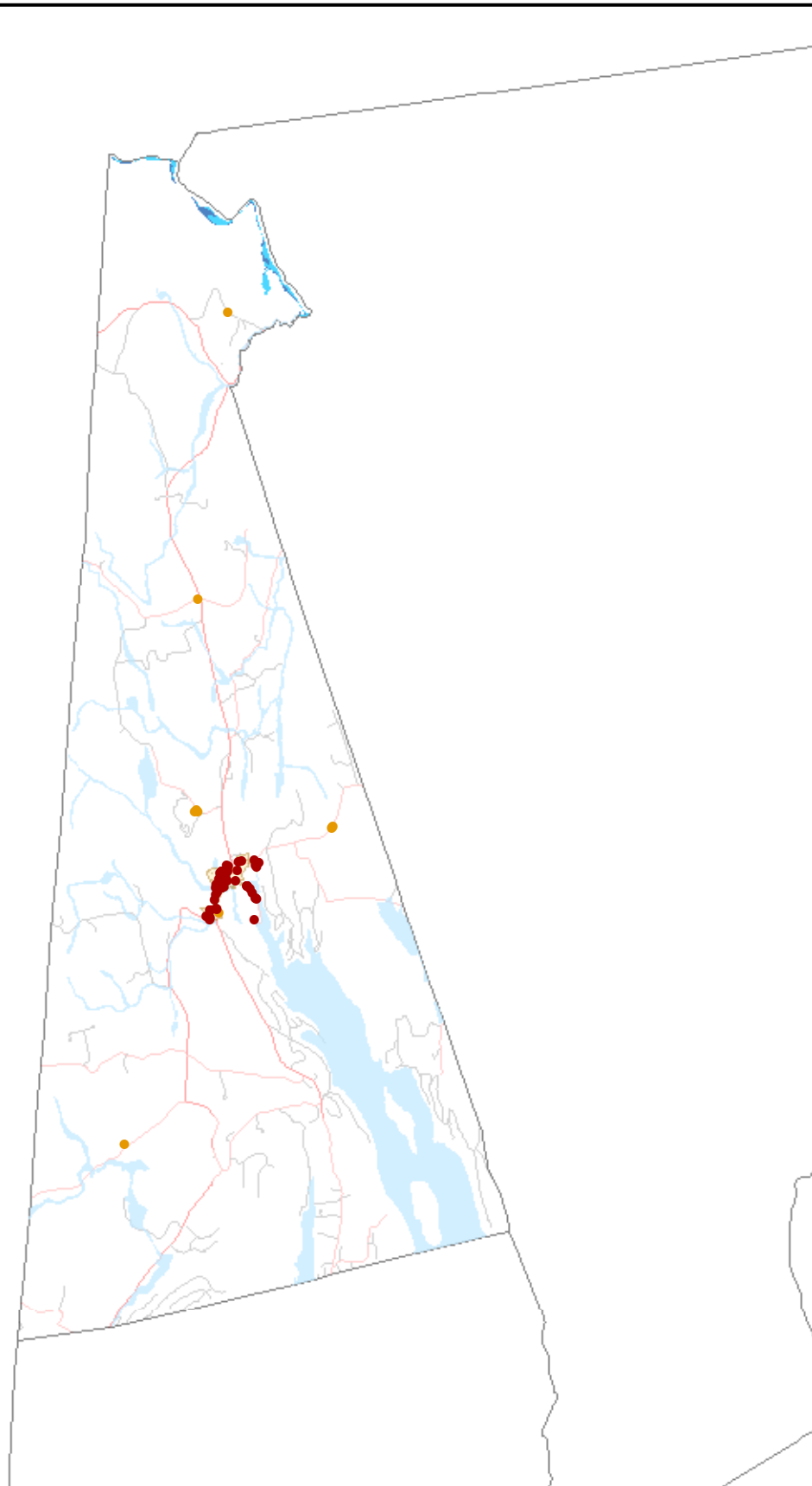
- Paraphrased from FEMA Report 386-6

Historic resources in Sherman are concentrated within the Sherman Historic District. Resources also include the White Silo Farm and Winery, Post Office, and Henry Hebbeln / Arshile Gorky House. See Figure 2-3 for a map of historic resources in the community.


Analysis of the State Historic Preservation Office (SHPO) database of historic resources shows that some of these resources are exposed to natural hazards, as shown in Table 2-5.

Table 2-5: Number of Historic Assets Exposed to Different Hazards in Sherman


Hazard	Count
Dam Failure	0
Earthquake	76
Flooding	-
1% Annual	0
0.2% Annual	0
Hurricane/Tropical Storm	76
Thunderstorm	76
Tornado	76
Winter Storm	76
Wildfire	64




LEGEND


 Cultural District


SHPO Historic Sites


 National Register

 State Register

Flood Zones

 A

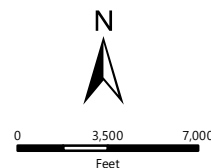
 AE

 0.2% Annual Chance Flood Hazard

 **MILONE & MACBROOM**
 99 REALTY DRIVE
 CHESHIRE, CT 06410
 203.271.1773
 WWW.MMINC.COM

Historic Resources with Flood Zones and
 Dam Failure Inundation Areas
 WestCOG Hazard Mitigation Plan
 Town of Sherman

NPS: Cultural Resources CT DEEP: DFA FEMA: DFRIM & Q3



SCALE	1" = 7,453'
DATE	1/6/2021
PROJ. NO.	3101-22

FIG. 2-3

Historic buildings and structures may be particularly susceptible to natural hazards because they were built prior to the establishment of more recent construction standards. Additionally, some of the structural integrity of these resources may have been degraded over the decades or centuries since their original construction. Structural retrofits and hazard mitigation methods may be challenging or restricted in cases where alteration of a resource will also diminish its cultural or historical aesthetic and value. Finally, miscommunications or lack of knowledge may lead to historic resources being damaged during the disaster recovery process.

Steps to incorporate historical and cultural preservation into hazard mitigation planning include:

- Inventory and survey historic and cultural resources
- Implement appropriate mitigation measures for those resources
- Take steps to move portable resources, such as artwork or documents, to safe locations prior to the occurrence of a hazard, if possible
- Consider these resources in emergency operations plans to prevent accidental damages during recovery efforts

Specific actions to mitigate natural hazard risks to historic resources are listed at the end of this Annex.

2.3 Infrastructure

2.3.1 Transportation

Route 37 and Route 39 are the two major transportation arteries out of town, with both routes connecting Sherman with New Milford to the northeast and New Fairfield to the south. Route 55 also provides access to Dover, New York to the west in the northern part of town. Sherman residents must use state roads in surrounding towns to access Interstate 84.

2.3.2 Utilities

The Timber Trails area of Sherman is served by an Aquarion Water Company system, and a number of non-community public water systems serve select other properties throughout Town. The majority of residents and businesses utilize private wells for drinking water.

There is no public wastewater utility in Sherman; residents rely on septic systems.

The electric utility for Sherman is Eversource. Sherman does not have natural gas service; residents and businesses rely on oil, propane, electricity, and wood fuel for heating.

2.4 Planning and Regulatory Capabilities

2.4.1 Review of Existing Local Plans

The Town has many planning documents that guide development. In addition to zoning, subdivision, and wetlands regulations, the Town has a Plan of Conservation and Development, a dry hydrant installation ordinance, and a road ordinance. The Plan of Conservation and Development was most recently updated in 2013.

Sherman has a number of plans that are relevant to hazard mitigation. These are noted here:

- **Plan of Conservation and Development (POCD):** Sherman's most recent POCD was adopted in 2013. It does not explicitly address natural hazard concerns within the

community, or explicitly include strategies that will mitigate risks from those hazards as the community continues to develop.

- **Capital Improvement Plan (CIP):** Sherman maintains a CIP that is updated annually and lays out capital investments for a five-year period. The CIP often includes road, drainage, and other infrastructure improvement projects relevant to hazard mitigation.
- **Economic Development Plan:** Sherman is included within the Western Connecticut Economic Development Plan of 2017, developed by WestCOG. The plan aligns with the COG's other efforts to promote climate sustainability and resiliency in the region.
- **Emergency Operations Plan (EOP):** Sherman's EOP is reviewed annually and updated as needed.

2.4.2 Review of Regulatory Structures

Sherman regulates development through a number of regulations, codes, and ordinances. These are summarized below. More detailed information about how these regulations relate to specific natural hazards are described in Section 3.

- **Building Code:** Sherman enforces the Connecticut State Building Code locally.
- **Zoning Regulations:** Most recently updated in March 2019.
- **Inland Wetlands and Watercourses Regulations:** Most recently updated in July 2009.

2.5 Emergency Services, Critical Facilities, Sheltering, and Evacuation

The Town considers its police, fire, governmental, and major transportation arteries to be its most important critical facilities since these are needed to ensure that emergencies are addressed while day-to-day management of Sherman continues. The Emergency Services Facility serves as the Town's Emergency Operations Center (EOC). The Town's emergency response vehicles are housed at the Emergency Services Facility. The Public Works Department Garage houses the Town's public works equipment and vehicles that would be utilized to respond to an emergency; a backup generator has been installed at this facility.

Educational institutions and churches are also included as critical facilities as these can be used as shelters or supply distribution centers. Cellular telecommunication towers are important to communication capabilities during and following disaster events; however, these sites are not specifically listed as critical facilities.

No elderly housing facilities or assisted facilities exist in the town. Populations of elderly and home-bound individuals who require special assistance during an evacuation or emergency are scattered throughout the town. The Sherman Renaissance Senior Center maintains a list of addresses of such residents. The Sherman Social Services Department and Senior Center have instituted an Emergency Support System to check on elderly residents in case of natural disasters, storms, or widespread power outages. This is an improvement over past emergency wellness-check protocols.

A map of the critical facilities in Sherman is shown as Figure 2-4, and a list of the critical facilities is provided in Table 2-6. Each critical facility and the Town's emergency response capabilities are described in more detail below, along with a summary of the potential for these facilities to be impacted by natural hazards.

Table 2-6: Critical Facilities in Sherman

Name	Type	Address	Emergency Power	Shelter	SFHA
Emergency Services Facility	EOC / Fire / Shelter	Route 39 North	✓	✓	
Mallory Town Hall	Police / Town Hall	9 Route 39 North	*		
Highway Department Garage	Public Works / Fire	43 Route 39 North	✓		
Sherman Consolidated School	School / Shelter	2 Route 37 East	✓	✓	
Sherman Renaissance Senior Center	Shelter	8 Route 37 Center		✓	
Holy Trinity Church	Shelter/Distribution	15 Route 37 Center			
Sherman Congregational Church	Shelter/Distribution	6 Church Road			
Jewish Community Center	Shelter/Distribution	9 Route 39 South			

* Equipped to operate on a portable generator.

Shelters

The Town of Sherman has designated two American Red Cross emergency shelters, and has additional facilities that can be used as needed. The Emergency Services Facility (an addition to the previous firehouse; also, the Town's EOC) is the primary shelter facility with a dedicated generator. The Sherman Consolidated School is the backup sheltering facility. Both buildings also have storage tanks containing fire-fighting water. In recent years, the Sherman Consolidated School has enhanced its security capabilities in response to concerns about school safety. While not directly related to natural hazards, security improvements have included adding an emergency radio system and placing trained security personnel at the school; these actions may additionally help with response to a natural hazard event.

These buildings have been designated as public shelter facilities by meeting specific American Red Cross guidelines. The Resident State Trooper and the Sherman Volunteer Fire Department staff the shelters. Amenities and operating costs of the designated shelters including expenses for food, cooking equipment, emergency power services, bedding, etc., are the responsibilities of the community and generally are not paid for by the American Red Cross.

The Mallory Town Hall is equipped to operate on a portable generator, but does not have a dedicated generator in place; this building has been used as the Emergency Operations Center in the past. The Sherman Renaissance Senior Center is located in the previous Town Hall building; this building has space available to be used as a shelter, but does not have emergency power.

LEGEND

Dams

- Unclassified
- AA
- A
- BB
- B
- Municipal
- EOC
- Fire
- School
- Shelter

Flood Zones

- A
- AE
- 0.2% Annual Chance Flood Hazard

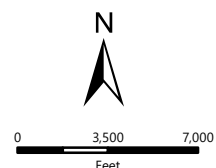
Flood Zones

- A
- AE
- 0.2% Annual Chance Flood Hazard

MILONE & MACBROOM
 99 REALTY DRIVE
 CHESHIRE, CT 06410
 203.271.1773
 WWW.MMINC.COM

Critical Facilities with Flood Zones and
 Dam Failure Inundation Areas
 WestCOG Hazard Mitigation Plan
 Town of Sherman

NPS: Cultural Resources CT DEEP: DFA FEMA: DFRIM & Q3



SCALE	1" = 7,443'
DATE	7/29/2021
PROJ. NO.	3101-22

FIG. 2-4

The Jewish Community Center is another site that could potentially be used as a shelter during a large evacuation. The Holy Trinity Church and the Sherman Congregational Church could also be used as shelters, but more likely would be utilized as supply distribution and food preparation facilities in the event of a long-term emergency. The Holy Trinity Church is currently the assigned shelter if students at Sherman Consolidated School are evacuated. None of these facilities is known to have sufficient emergency power to support sustained overnight sheltering needs.

In case of a power outage, it is anticipated that 10 to 20% of the population would relocate although not all of those relocating would necessarily utilize the shelter facilities. Sherman utilizes its facilities on a temporary basis to provide shelter until hazards such as hurricanes diminish. Regionally located mass care facilities operated and paid for by the American Red Cross may also be available during recovery operations when additional sheltering services are necessary.

Flood events can inundate Routes 37 and 39, making north-south travel difficult. One consequence of this is that residents in the southern part of Town may not be able to access emergency shelters in the north. Designating another shelter in the southern section of Town could improve the Town's resilience to hazards. Residents in the southern part of Town are also able to utilize shelters in New Fairfield to the south.

Emergency Response Facilities

The Office of Emergency Management (OEM) coordinates emergency preparedness in the Town of Sherman. The office administers programs that provide training for emergency response personnel, support state and local emergency response exercises, and provide technical assistance to state and local emergency response agencies and public officials. Its goal is to provide citizens with the highest level of emergency preparedness before, during, and after disasters or emergencies.

Sherman participates in the Resident State Trooper Program rather than maintaining its own police force. Program benefits include access to all services provided within the Connecticut State Police Department. The Town uses 9-1-1 for emergency notification and response. The Candlewood Lake Authority has a small seasonal police force that is overseen by CT DEEP, but they provide security more than emergency services. The Resident State Trooper has a list of contacts for each of the private lake communities if there is a nonemergency issue but, during emergency situations, the Office of Emergency Management and the Fire Department assist the private communities.

The Sherman Volunteer Fire Department provides firefighting and ambulance services for the residents of Sherman. The Town also participates in a paramedic intercept program that deploys a paramedic to the scene when warranted by the victim's symptoms.

Fire Department apparatus include two ambulances, one fire engine, one rescue pumper, one tanker truck, one brush truck, one gator, and a portable light tower. The Town consistently updates and replaces emergency equipment as needed; in recent years it has retired two old fire engines and purchased a new replacement rescue pumper, as well as a new state-of-art-ambulance. The Fire Department had a rescue boat until 2009 when it was retired from use. Currently, the Town is relying on its mutual aid agreements with other municipalities and from the

lake communities until it can be replaced. Access to a rescue boat is important because during some emergencies it is easier and faster to access the lake communities by water than by land.

Emergency Alerts and Communication

An effective emergency communication system is integral to timely emergency response. During the February 2013 Winter Storm, power outages were widespread, and seriously impacted Timber Trails and other lake communities. In order to update residents as to the progress being made to restore power, First Selectman Cole walked door-to-door and communicated by word of mouth. The Town's communication capabilities have improved since then in a number of ways. The First Selectman operates an account on Twitter, which feeds directly to the Town's Facebook page and Website. The First Selectman is able to "tweet" information, and it will instantly be visible through a number of media. Additionally, Sherman has implemented Nixle, an Everbridge public alert program. This tool allows the Town to send alerts to residents by text, voice call, and social media. Residents must opt-in to this system; a link is shared on the Town website.

In addition, existing Everbridge accounts are operated by:

- The Consolidated School (accessible to parents and teachers only)
- Litchfield County Fire (The First Selectman receives information through this Everbridge account, and shares that information with the Town through Twitter)
- Connecticut State Police (available to any resident of Connecticut)

These accounts, though not directly operated by the Town, provide residents with additional convenient sources of information about hazards and hazard response.

Sherman operates on a high band radio system, but there are many "dead zones" in Sherman where radios fail to transmit effectively due to the many hills in Town. The Fire Department has upgraded its portable radios with a grant from FEMA, improving its ability to communicate during an emergency. Additionally, the Town has developed positive relationships and communication pathways with local telecommunication companies, and has assembled a Town committee to work on improving cellular coverage in the Town. Additional cell towers are expected to be installed in coming years as a result of these efforts.

It is important to note that member communities of the former HVCEO ratified a Regional Mutual Aid Agreement for emergency response activities within the Housatonic Valley region on June 10, 2010. This agreement remains effective despite the incorporation of HVCEO into WestCOG, and provides a more formalized approach to providing mutual aid during a major regional emergency. The member communities of HVCEO had previously ratified a Regional Public Health Mutual Aid Agreement for response to bioterrorism and other forms of public health emergencies in 2006. The Town is in Region 5 of the Connecticut Emergency Medical Service regions.

Transportation

In the event that an evacuation is needed in an emergency, the Town can utilize the Senior Center van and school buses. There is no mass public transportation in the town of Sherman, so mass transit vehicles are not available if needed for an evacuation.

The town of Sherman does not have any hospitals or medical centers. Instead, residents use the nearby facilities in New Milford or Danbury. As a means of accessing these facilities, Sherman residents travel along Route 37 and Route 7 in New Milford or south along Route 37 into Danbury through New Fairfield. There is no regional emergency/evacuation plan.

Sherman has many dead-end roads, and many are relatively long and/or private, with some of these owned and maintained by homeowner associations. Emergency services can be cut off by fallen trees or washed out culverts during emergencies. The Office of Emergency Management has provided education to the private communities about road and tree maintenance to help ensure adequate access, while the Town tree warden maintains trees along public roads.

The most difficult emergency response problem in Sherman is poor access to the private lake communities. These roads are narrow, often one lane, and have steep grades that impede access by modern firefighting and rescue equipment. Grades exceed 15% and widening is often impossible. Pavement has deteriorated in many locations, whereas some roads are unpaved. Some roads have deteriorated because there was no association set up to manage them when they were originally built, and private owners very rarely want to pool money for repairs. The Town utilizes the gator and other all-terrain vehicles to provide emergency response to these areas. New public and private roads are regulated by the Town through the subdivision process, such that emergency access is not an issue moving forward.

Potential Impacts from Natural Hazards

Critical facilities are rarely impacted by flooding in the town of Sherman as none are located within floodplains. However, a portion of the parking areas at Sherman Consolidated School and Holy Trinity Church lies within the mapped 1% annual-chance floodplain, which could limit vehicular space at these facilities. Route 37 and Route 39 in the center of town have experienced flood damage during large storm events. As this road is the only connector between southern and northern Sherman, flooding slows emergency response times to the southern portion of town due to long out-of-town detours. The Town would like to upgrade Jericho Road North (much of which is currently an unpaved, one-lane trail) to provide an additional means of egress north or east around the center of Sherman. It is also recommended that the Town implement regulations limiting further development of dead-end roads.

None of the critical facilities in Sherman are any more susceptible to wind, summer storms, winter storms, or earthquakes than structures in the rest of the town. In addition, no critical facilities are believed near enough to a stream to be within a potential dam failure inundation area or within an area at increased risk of wildfires. The following sections will discuss each natural hazard in detail and include a description of populations at risk.

Summary

Sherman has increased its capacity to communicate with residents by incorporating social media and the internet into the Town's suite of emergency communication methods, and by implementing the Everbridge Nixle program locally.

The Town has added an OEM page to the Town webpage, which provides information about how the Town prepares for disasters, and contact information. The Town also has the ability to post

updates about specific disasters on the Town website, or to create a page dedicated to information about a specific event.

Hazard mitigation programs and policies in the Town include: training and technical assistance programs operated by the OEM; participation in the Resident State Trooper program; a Paramedic Intercept Program; the former HVCEO Regional Mutual Aid Agreement; the Renaissance Senior Center's program maintaining a list of elderly and home-bound residents throughout Town; and the Town's established policy of routing Town maintenance complaints to the DPW.

Overall, Sherman continues to increase its ability to manage emergencies.

3.0 HAZARD ASSESSMENT

3.1 FLOODING (COASTAL, INLAND, AND ICE JAMS)

3.1.1 Setting

According to FEMA, most municipalities in the United States have at least one clearly recognizable floodprone area around a river, stream, or large body of water. These areas are outlined as Special Flood Hazard Areas (SFHA) and delineated as part of the National Flood Insurance Program (NFIP).

Many communities also have localized flooding areas outside the SFHA. These floods tend to be shallower and chronically reoccur in the same area due to a combination of factors. Such factors can include ponding, poor drainage, inadequate storm sewers, clogged culverts or catch basins, sheet flow, obstructed drainageways, sewer backup, or overbank flooding from small streams.

In general, flooding affects a small area of Sherman with moderate to frequent regularity. The areas impacted by overflow of river systems are generally limited to river corridors and floodplains. Indirect flooding that occurs outside floodplains and localized nuisance flooding along tributaries is a more common problem in the town. This type of flooding occurs particularly along roadways as a result of inadequate drainage and other factors. The frequency of flooding in Sherman is considered likely for any given year, with flooding damage potentially having significant effects during extreme events.

Flooding is the most common and costly natural hazard in Connecticut. The state typically experiences floods in the early spring due to snowmelt and in the late summer/early autumn due to frontal systems and tropical storms, although localized flooding caused by thunderstorm activity can be significant. Flooding can occur as a result of other natural hazards, including hurricanes, summer storms, and winter storms. Flooding can also occur as a result of dam failure, and may also cause landslides and slumps in affected areas.

3.1.2 Capabilities

Participation in the National Flood Insurance Program

The Town of Sherman participates in the National Flood Insurance Program (NFIP). The Land Use Enforcement Officer serves as the NFIP administrator and oversees the enforcement of NFIP regulations. The Town revised its "Federal Flood Insurance Program" ordinance in June 2010 concurrent with the revised FIS and FIRMs for Fairfield County. The degree of flood protection established by this ordinance meets the minimum reasonable for regulatory purposes under the NFIP. Sherman currently has no plans to enroll in the Community Rating System program, which would require surpassing NFIP minimum flood protection requirements.

SFHAs in Sherman are delineated on a Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS). The FIRM delineates areas within Sherman that are vulnerable to flooding. The original FIS and FIRMs for Sherman were published on June 18, 1987. Updates to both the FIRM and the FIS were published as part of the Fairfield County FIS update on October 16, 2013. The Town of Sherman intends to continue participating in the NFIP.

The Town's Planning and Zoning Commission uses the 1%-annual-chance flood lines from the FIRM delineated by FEMA to determine floodplain areas. Site plan standards require that all proposals be consistent with the need to minimize flood damage, that public facilities and utilities be located and constructed to minimize flood damage, and that adequate drainage is provided. The Sherman Inland Wetlands Agency also reviews new developments and existing land uses on and near wetlands and watercourses.

Regulations, Plans, and Local Floodplain Management

The Town has in place a number of measures to prevent flood damage. These include regulations, codes, and ordinances preventing encroachment and development near floodways. One way that Sherman discourages new construction and substantial reconstruction within the 1% annual-chance floodplain is by requiring compensatory mitigation activities. According to the Land Use Officer, it is unlikely that new buildings will be built in the floodplain, and therefore the number of structures vulnerable to flooding is unlikely to increase.

Regulations, codes, and ordinances that apply to flood hazard mitigation in conjunction with and in addition to NFIP regulations include:

- **Federal Flood Insurance Program Ordinance:** This ordinance outlines the minimum requirements for flood protection under the NFIP adopted by Sherman and designates the Land Use Enforcement Officer as the administrator and regulator of the Town's NFIP regulations. The regulations forbid variances for floodway activities that result in any increase in base flood elevation and require compensatory storage activities for activities within floodplains. The regulations also state that new construction or substantial improvement of residential structures requires that the lowest floor level be elevated above the base flood elevation and that floodproofing is not allowed for nonresidential structures.
- **Inland Wetlands and Watercourses Regulations.** This document defines in detail the Town's regulations regarding development near wetlands, watercourses, and water bodies that are sometimes coincident with floodplains.
 - ⇒ Section 2 defines "Regulated Activities" covered by the regulations.
 - ⇒ Section 6 states that no person may conduct or maintain a regulated activity without obtaining a permit.
 - ⇒ Section 7 outlines the application requirements. These include certifying whether water drainage or runoff from the site will impact municipal drainage systems or municipal or private properties (7.8.c,d).
- **Plan of Conservation and Development.** Section III.C of the 2001 Plan states that the amount of land suitable for development is dependent on limitations set by federal statutes (such as the NFIP and FIRM mapping), state statute (such as Inland Wetland and Watercourses Regulations), and Town regulations (such as Zoning and Subdivision regulations).
- **Road Ordinance.** This ordinance regulates the construction of roads in the town of Sherman and requires that storm drainage design will require appropriate safeguards for prevention of flooding and soil erosion.

- ⇒ Section 7.9.2 notes that (a) all drainage systems must be designed to pass the 25-year flood event, (b & c) all cross culverts for intermittent and minor streams must be designed to pass the 50-year storm event, and (d) all cross culverts for major streams must be designed to pass the 100-year flood event.
- **Zoning, Soil Erosion and Sediment Control, and Subdivision Regulations.** This suite of regulations is consolidated into a single document. The most recent amendments to the Zoning Regulations, Soil Erosion and Sediment Control Regulations for Land Development, and Subdivision Regulations, were made in 2019, 1991, and 2015, respectively.
 - ⇒ Soil Erosion and Sediment Control Regulations section 4.1 states that a soil erosion and sediment control plan must “reduce the danger from storm water runoff on the proposed site.” Section 5 sets the minimum standards as those in adherence with the principles in the Connecticut Guidelines for Soil Erosion and Sediment Control (1985).
 - ⇒ Subdivision Regulation 6.a.16 require that 100-year flood hazard areas are presented on plans as shown by the official maps stored at Mallory Town Hall. These plans must be certified by a professional engineer licensed in the State of Connecticut and show that adequate provisions have been made for drainage and flood control.

Sherman has programs in place to execute each of these regulations. The intent of these regulations is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas of the town of Sherman by the establishment of standards designed to:

- Protect human life and public health
- Minimize expenditure of money for costly flood control projects
- Minimize the need for rescue and relief efforts associated with flooding
- Minimize prolonged business interruptions
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, and streets and bridges located in floodplains;
- Maintain a stable tax base by providing for the sound use and development of floodprone areas in such a manner as to minimize flood blight areas
- Ensure that purchasers of property are notified of special flood hazards
- Ensure the continued eligibility of owners of property in Sherman for participation in the National Flood Insurance Program

Sherman maintains a checklist that cross-references the bylaws, regulations, and codes related to flood damage prevention that may be applicable to a proposed project, and makes this list available to potential applicants.

Flood Control and Drainage Projects

The Sherman Department of Public Works (DPW) oversees the maintenance of the town's drainage systems and performs clearing of bridges and culverts and other maintenance as needed. Drainage complaints are routed to the DPW and recorded. The Town uses these documents to identify potential problems and plan for maintenance and upgrades. The Town receives regular weather updates through DEMHS Region 5 email alerts.

The Town commissioned bridge studies in 1999 (following Tropical Storm Floyd) and 2010 to inspect Town-owned bridges, and a number of culvert replacements have been performed since those studies to increase conveyance. The majority of Sherman's drainage structures are considered to be sized for all but the most extreme flood events, and all new construction must be sized for either the 50-year or the 100-year flood event as outlined in the Road Ordinance.

Emergency Services

The National Weather Service issues a flood watch or a flash flood watch for an area when conditions in or near the area are favorable for a flood or flash flood, respectively. A flash flood watch or flood watch does not necessarily mean that flooding will occur. The National Weather Service issues a flood warning or a flash flood warning for an area when parts of the area are either currently flooding, highly likely to flood, or when flooding is imminent.

The Town of Sherman can also access the **National Weather Service** website at <http://weather.noaa.gov/> to obtain the latest flood watches and warnings before and during precipitation events.

Actions Completed and New Capabilities

Actions completed by Sherman, or new capabilities it has acquired in the last five years include the following:

- Sherman has retained a structural engineer to perform an examination of all bridges in Town, allowing the Town to meet state requirements for bridge inspection and maintenance. The Town plans to complete any bridge repairs recommended by the engineer with town funds.
- The Fox Run detention basin was upgraded in 2018 to allow it to accommodate a larger quantity of runoff.
- The Town has upgraded Jericho Road North to provide additional egress north from the Town Center.
- The Town has added explicit language requiring zero increase in stormwater runoff from new developments.
- The bridge over Tollgate Brook on Old Greenwoods Road has been repaired.
- The Wagon Wheel Road culvert at Glen Brook has been repaired.
- The Town has a beaver dam monitoring and mitigation program, which includes the use of beaver deterrent devices.

Summary

Sherman's policies and programs include the following: current participation and a policy of continued future participation in the NFIP; requiring that developers submit site plans to the relevant municipal commissions prior to new construction; requiring that all new construction minimize flood damage and provide adequate drainage; providing a checklist of flood-damage prevention codes and ordinances to developers; maintenance and clearing of drainage systems,

culverts, and bridges by the DPW; and reviewing drainage complaints to identify and prioritize problem locations (performed by the DPW).

The Town primarily attempts to mitigate flood damage and flood hazards by restricting building activities inside floodprone areas. Relevant policies are enforced by both the Planning and Zoning and the Inland Wetlands Commissions. All watercourses are to be encroached minimally or not at all to maintain the existing flood carrying capacity. Town Policy is that these regulations rely primarily on the FEMA-defined 1% annual-chance flood elevations to determine flood areas. The Town also focuses on preventing increased runoff into rivers from development by requiring developers to allow a “net zero” increase in runoff after construction.

3.1.3 Vulnerabilities and Risk Assessment

The town of Sherman has experienced various degrees of flooding in every season of the year throughout its recorded history. Melting snow combined with early spring rains have caused frequent spring flooding. Numerous flood events have occurred in late summer to early autumn resulting from storms of tropical origin moving northeast along the Atlantic coast. Winter floods result from the occasional thaw, particularly during years of heavy snow, or periods of rainfall on frozen ground. Other flood events have been caused by excessive rainfalls upon saturated soils, yielding greater than normal runoff.

The majority of the watercourses in Sherman are mapped as Zone A, while the Tenmile River and the Housatonic River are mapped as Zone AE. Refer to Figure 2-4 for the areas of Sherman susceptible to flooding based on FEMA flood zones.

This section discusses specific areas at risk to flooding within the Town. Major land use classes and critical facilities within these areas are identified. According to the FEMA FIRMs, 1,583 acres of land in Sherman are located within the 1% annual-chance flood boundary. In addition, indirect and nuisance flooding occurs near streams and rivers throughout Sherman due to inadequate drainage and other factors, such as beaver dams.

Vulnerability Analysis of Repetitive and Severe Repetitive Loss Properties

There are currently no repetitive loss properties in the Town of Sherman.

Vulnerability Analysis of Areas Along Watercourses

The primary waterways in the town are the Tenmile River and the Housatonic River, which form Sherman's northern boundary with Kent and part of New Milford. The remaining waterways in Sherman are mostly small streams and brooks significant for water supply and conservation purposes but are not recreational resources. Candlewood Lake and Lake Mauweehoo are significant recreational resources. Recall that floodplains with elevations are delineated for the Tenmile River and the Housatonic River, while the majority of the smaller brooks and streams, including the major water bodies, have floodplains delineated by approximate methods. All of these delineated floodplains are generally limited to the areas adjacent to the streams.

Due to the steep topography surrounding the major watercourses, there is little wide-scale flooding in Sherman. The majority of flooding problems affect infrastructure such as bridges and drainage systems and occurs due to large amounts of rainfall falling in conjunction with snowmelt

as noted below. A primary challenge in Sherman is the isolation of neighborhoods due to flooding.

Primary Areas of Concern:

- Barlow Farm Road – Drainage in this area was overloaded in the April 2007 storms, causing erosion of stones on a nearby hillside.
- Beaver Creek Lane – Beavers dam Naromi Brook at this crossing, causing minor flooding nearby.
- Candlewood Echos Association – Shallow flooding occurs in this private community when storm drains along Route 39 become clogged and the backwater flows off the roadway. Drainage system maintenance is reportedly an issue throughout the town.
- Candlewood Lake Estates – The only access road into this private community has undersized cross culverts. Flood waters during heavy rains are causing damage to the roadway.
- Church Road Near Babbling Brook Drive – This area flooded and overtopped the road during the April 2007 storms. No structures were affected by flooding.
- Coote Hill – The culvert beneath this street receives outflow from Pepper Pond. The culvert appears to have been damaged by flooding.
- Farm Road – Heavy storms can cause the unnamed stream at the intersection end of this dead-end road to overtop the road by up to a foot. This road is the only access into a 22-home subdivision.
- Old Greenwoods Road – The April 2007 storms damaged the bridge, which conveys Greenwoods Brook under the intersection end of this dead-end road. Repairs to this bridge commenced in 2010.
- Old Greenwoods Road Extension – The bridge over Tollgate Brook is at the intersection end of a dead-end road, and the bridge is considered to be in fair but deteriorating condition due to floodwaters. Three houses lie beyond the bridge. Town officials specifically highlighted this crossing as vulnerable to washout.
- Sawmill Road – The bridge over Sawmill Brook required heavy repairs after Tropical Storm Floyd in 1999 and additional repairs after the April 2007 storm. The Town is concerned that they may have to do a complete rebuild of the bridge if another severe flooding event occurs. This bridge is the only means of egress to 15 homes, the town beach, and the town marina.
- Wagon Wheel Road – The culverts conveying Glen Brook beneath this road are likely undersized for peak flood events. This bridge sustained damage during the 1999 and 2007 storms, and Town officials specifically highlighted this crossing as vulnerable to washout.

Sherman has many dead-end roads, and many of these roads cross a watercourse near the intersection end. These areas could potentially be cut off from emergency services during a severe flooding event. Bridge scour and overtopping from spring floods are also recurring problems on some of these roads, particularly when culverts become blocked by debris. Sherman does not currently regulate the number of homes on dead end streets. Table 3-1 presents a list of the dead-end roads in town that span a mapped watercourse:

Table 3-1: Dead-End Roads in Sherman That Span a Mapped Watercourse

Road	Road Type	Watercourse	Houses Beyond Watercourse
Big Trail	Private	Quaker Brook	60

Road	Road Type	Watercourse	Houses Beyond Watercourse
Green Pond Road	Private	Outflow from Green Pond to Candlewood Lake	46
Edmonds Road	Public	Western Tributary to Naromi Brook	36
Hillside Drive	Private	Tributary to Allens Cove at Candlewood Lake	34
Mauweehoo Hill	Public	Outflow from Lake Mauweehoo to Glen Brook	30
Farm Road	Public	Tributary to Naromi Brook	22
Sawmill Road	Public	Sawmill Brook	15
Orchard Beach Road	Private	Outflow from Green Pond to Candlewood Lake	14
Timber Lake Road	Private	Quaker Brook	10
Clover Leaf Farm North	Public	Tributary to Wimisink Brook	8
Wagon Wheel Road	Public	Glen Brook	8
Evergreen Drive	Public	Tributary to Wimisink Brook	7
Jericho Road North	Public	Tributary to Naromi Brook	7
Ledgewood Drive	Private	Tributary to Candlewood Lake	7
Coote Hill	Private	Outflow from Pepper Pond	6
Glenview Drive	Public	Glen Brook	6
Edmonds Road	Public	Eastern Tributary to Naromi Brook	4
Old Greenwoods Road	Public	Greenwoods Brook	4
Clover Lear Farm South	Public	Tributary to Wimisink Brook	3
Old Greenwoods Road Ext.	Public	Tollgate Brook	3
Timber Lake Road North	Private	Quaker Brook	2
Beaver Creek Lane	Public	Naromi Brook	1
Hollow Brook Road	Public	Quaker Brook	1

Source: 2004 Aerial Photography (CLEAR), Connecticut DEP

The 2010 Fairfield County DFIRM mapping was utilized with the 2004 leaf-off aerial photography mosaic available from the Connecticut DEEP to determine the number of structures within SFHAs. Structures are not located within the Zone AE 1%-annual chance floodplain, and a total of 22 residential structures are located within the Zone A 100-year floodplain throughout the town. This is equivalent to approximately 1% of the total number of structures in town. The highest concentration of houses (nine) in the mapped floodplain is along Sawmill Brook and Tollgate Brook just southwest of the town center. According to AOL Real Estate, the average market value for a home in Sherman for July 2010 was \$388,408. Thus, the estimated value of the homes within the 100-year floodplain is \$8,544,976.

As stated in Section 2.1.3, precipitation in Connecticut has been increasing, and will continue to increase with climate change. The result is that culverts and other drainage infrastructure may no longer, or in the future may not, be capable of passing their design storms without the occurrence of backwater or overtopping. It is possible that increasing rainfall over time could lead to a wider and deeper mapped floodplain.

Vulnerability Due to Climate Change

In accordance with Public Act 13-179, Section 6 (effective 10/1/2013), the sea level change scenarios published in the NOAA Technical Report OAR CPO-1 were considered in development of this plan. According to that report, the worst-case scenario for sea level rise by 2100 is a global

average increase of 6.6 feet above the 1992 mean sea level. In the coastal Connecticut area, sea level has risen between 0 and 2 feet per century since 1854. The entire Town of Sherman is above 6.6 feet of elevation, and does not include any tidally influenced watercourses. Therefore, this community is unlikely to be affected by sea level rise through 2100.

Critical Facilities and Emergency Services

Critical facilities are not regularly impacted by flooding in the town of Sherman, as shown by the spatial relationship between 1% annual-chance floodplains and critical facilities on Figure 2-4. Route 37 / Route 39, the only thoroughfare connecting northern and southern Sherman, has received flooding damage from Sawmill Brook during severe storms. This flooding slows emergency response times to the rest of Sherman due to long detours around this area.

3.2 DAM FAILURE

3.2.1 Setting

Dam failures can be triggered suddenly, with little or no warning, and often from other natural disasters such as floods and earthquakes. Dam failures often occur during flooding when the dam breaks under the additional force of floodwaters. In addition, a dam failure can cause a chain reaction where the sudden release of floodwaters causes the next dam downstream to fail.

While flooding from a dam failure generally has a moderate geographic extent, the effects are potentially catastrophic. A major dam failure is considered only a possible hazard event in any given year.

3.2.2 Capabilities

The Dam Safety Section of the Connecticut DEEP Inland Water Resources Division is charged with the responsibility for administration and enforcement of Connecticut's dam safety laws. The existing statutes require that permits be obtained to construct, repair, or alter dams and that existing dams be inventoried and periodically inspected to assure that their continued operation does not constitute a hazard to life, health, or property.

Dams regulated by the Connecticut DEEP must be designed to pass the 1% annual chance rainfall event with one foot of freeboard, a factor of safety against overtopping.

Significant and high hazard dams are required to meet a design standard greater than the 1% annual chance rainfall event.

The dam safety requirements are codified in Sections 22a-401 through 22a-411 inclusive of the Connecticut General Statutes. Sections 22a-409-1 and 22a-409-2 of the Regulations of Connecticut State Agencies have been enacted and set requirements for the registration, classification, and inspection of dams. Dams must be inventoried by the owner with the Connecticut DEEP according to Connecticut Public Act 83-38.

Effective October 1, 2013, the owner of any high or significant hazard dam (Class B and C) must develop and implement an EAP after the Commissioner of DEEP adopts regulations. The EAP shall be updated every two years, and copies shall be filed with DEEP and the chief executive officer of any municipality that would potentially be affected in the event of an emergency. New regulations shall establish the requirements for such EAPs, including but not limited to (1) criteria and standards for inundation studies and inundation zone mapping; (2) procedures for

monitoring the dam or structure during periods of heavy rainfall and runoff, including personnel assignments and features of the dam to be inspected at given intervals during such periods; and (3) a formal notification system to alert appropriate local officials who are responsible for the warning and evacuation of residents in the inundation zone in the event of an emergency.

Dam failure analyses have been prepared for many of the high hazard dams, and these are included in the EAPs. The inundation limits portrayed in the dam failure analysis maps represent a highly unlikely, worst-case scenario (1,000-year) flood event and should be used for emergency action planning only. These analyses should not be interpreted to imply that the dams evaluated are not stable, that the routine operation of the dams presents a safety concern to the public, or that any particular structure downstream of the dam is at imminent risk of being affected by a dam failure.

The CT DEEP also administers the Flood and Erosion Control Board program, which can provide noncompetitive state funding for repair of municipality-owned dams. Funding is limited by the State Bond Commission. State statute Section 25-84 allows municipalities to form Flood and Erosion Control Boards, but municipalities must take action to create the board within the context of the local government such as by revising the municipal charter. The Town of Sherman established a Flood and Erosion Control Board by ordinance dated January 28, 2000. More information regarding the Flood and Erosion Control Board program can be found at portal.ct.gov/DEEP/Water/Dams/State-Owned-Dams-and-Flood-Control-Systems.

Actions Completed and New Capabilities

Sherman's capabilities to mitigate for dam failure and prevent loss of life and property have increased since the initial HMP was adopted, mainly as a result of recent statewide legislative actions described above. In the next few years, dam safety programs will continue to strengthen. Improved communication represents an additional improved capability.

Sherman also attends roundtable meetings about Candlewood Lake dam safety every couple of years when they occur.

Summary

Programs enacted in Sherman to mitigate dam failure include participation in the Statewide Dam Safety Program, staying up to date on the evolution of any EOPs and Dam Failure Analyses for high hazard dams in Town, and making copies of those documents available at the Town Hall for public viewing. Participation in the DEEP Flood Erosion and Control Board program is an additional important capacity.

3.2.3 Vulnerabilities and Risk Assessment

The Connecticut DEEP administers the statewide Dam Safety Program and designates a classification to each state-inventoried dam based on its potential hazard.

- Class AA: negligible hazard potential
- Class A: low hazard potential
- Class BB: moderate hazard potential
- Class B: significant hazard potential
- Class C: high potential hazard

In 1996 there were 18 DEP-registered dams within the town of Sherman, of which eight were Class A, two were Class BB, five were Class B, and three were undefined. The list of Class B and C dams was updated by the DEEP in 2020. Dams in Sherman, as of 2020, are listed in Table 3-2.

Table 3-2: Dams Registered With the DEEP in the Town of Sherman

Number	Name	Location	Class
12701	Deer Pond Dam ¹	Off Route 37 South	AA
12702	Rogers Pond Dam	Off Jericho Road North	BB
12703	Timber Lake Dam	Timber Lake Road North	B
12704	Lake Mauweehoo Dam	Mauweehoo Hill	BB
12705	Pepper Lake Dam	Coote Hill	BB
12706	Green Pond Dam	Green Pond Road	BB
12707	Valley Lake Dam	Off Route 37	BB
12708	Jennings Pond Dam	Chapel Hill Road	A
12709	Chapel Pond Dam	Chapel Hill Road	A
12710	Greenwood Pond Dam	Off Route 37 South	A
12711	Briggs Pond Dam	Route 37 South	-
12712	Tollgate Pond Dam	Old Greenwoods Road Ext.	A
12713	Spring Lake Dam	Off Spring Lake Drive	B
12714	Wimisink Pond Dam	Off Route 39 North	A
12715	{Unnamed Dam}	Off Route 55	A
12716	Haviland Millpond Dam	Off Candlewood Lake Drive	A
12717	Hughson Dam	Jericho Road North	-
12718	Edmonds Pond / Bully Pond Dam	Edmonds Road	A

¹ Reported as breached on the 2007 DEEP list

As no Class C dams lie within or upstream of the town of Sherman, the failure of any of the Class B dams in the town would likely have the highest impact on the residents and infrastructure of the town of Sherman. However, the failure of any of the 15 other dams in town could also have impacts within the town of Sherman. The impacts related to the larger and higher-hazard dams in town, namely the Deer Pond Dam, Spring Lake Dam, and Timber Lake Dam are described in general detail below.

According to Town personnel, the dams throughout town are in varying stages of condition, with the higher hazard dams being in generally good condition. The following paragraphs provide a description and highlight the general condition these dams based on information available at the Connecticut DEEP:

- Deer Pond Dam – This reservoir dam is owned by the Timber Trails Corporation and located along Quaker Brook in southwestern Sherman. It was reported as breached on the 2007 high hazard dam list compiled by DEEP. This dam impounds Quaker Brook. A dam failure has the potential to cause damage to the bridge on Big Trail, which leads to 60 homes in the Timber Trails Association, and potentially could also cause some damage to the bridge downstream on Route 37 in neighboring New Fairfield.
- Spring Lake Dam – This private dam is located off Spring Lake Road. The outlet from the dam feeds a major unnamed tributary to Saw Mill Brook. The dam is maintained by the owner and is believed to be in good condition. Floodwaters from a dam failure would follow Sawmill Brook through an undeveloped area of Sherman for approximately one mile before reaching State Route 37/Route 39. A dam failure could potentially cause damage to the bridges at the state road and on Sawmill Road before the floodwaters were mitigated by Candlewood Lake.
- Timber Lake Dam – This dam is owned by the Timber Trails Corporation and is located on Timber Lake Road North. It is an earthen dam with concrete abutments and a concrete spillway that impounds Quaker Brook. Flashboards are used to raise the water level of the pond approximately six additional inches above the spillway. The dam is believed to be in fair to good condition. A dam failure could potentially cause damage to the Timber Lake Road North and Timber Lake Road bridges and possibly the Route 37 South bridge before the flow was mitigated by Valley Pond and Deer Pond downstream.
- Pepper Pond Dam – According to Town personnel, this dam was cited by the DEEP as being poorly maintained. It is a Class BB dam that drains into Lake Mauweehoo. Field inspections suggest that the maintenance issues may be related to poor vegetation management on the embankments near the spillway.

While the failure of any of the Candlewood Lake dams or dikes would not have a direct impact on the town of Sherman, residents bordering the lake and those who have boats moored at the lake would be indirectly affected. Any failure would cause the lake level to lower, and a complete failure could cause the entire lake to drain. A rapid drawdown could cause damage to boats as they come to rest on the bed of the lake, and if the dams are not restored, the failure would negatively impact individual property values.

A significant dam failure occurred in the town of Sherman due to flooding in April of 2007. Floodwaters at Rogers Pond Dam (Class BB) overtopped the spillway and caused a full failure that drained the pond. Part of the earthen embankment failed, and the floodwaters cut a breach 30 feet wide and 15 feet deep. The dam was originally constructed in 1945 and was repaired following the breach. According to the Association of State Dam Safety Officials, a dam in Bethany, Connecticut and a dam in Waterford, Connecticut also experienced failures due to the April 2007 flood. A presidential disaster was declared for both Fairfield and Litchfield counties following this storm. FEMA records show \$62,695.47 were paid out to the Town of Sherman to help cover the costs of five recovery projects.



Rogers Pond Dam Breach, April 2007

The Town of Sherman is also concerned with the potential failures of beaver dams. This is a typical concern in many Connecticut communities, and beaver dam failures have been known to cause damage in the state.

3.3 HURRICANES AND TROPICAL STORMS

3.3.1 Setting

Hazards associated with tropical storms and hurricanes include winds, heavy rains, and inland flooding. While only some of the areas of Sherman are susceptible to flooding damage caused by hurricanes, wind damage can occur anywhere in the town. A hurricane striking Sherman is considered a possible event each year and could cause critical damage to the town and its infrastructure.

Connecticut is located in FEMA Zone II regarding maximum expected wind speed. The maximum expected wind speed for a three-second gust is 160 mph. This wind speed could occur as a result of either a hurricane or a tornado in western Connecticut and southeastern New York. Parts of tall and older trees may fall during heavy wind events, potentially damaging structures, utility lines, and vehicles.

Inland Connecticut is vulnerable to hurricanes despite moderate hurricane occurrences when compared with other areas within the Atlantic Tropical Cyclone basin. Since hurricanes tend to weaken within 12 hours of landfall, inland areas are relatively less susceptible to hurricane wind damages than coastal areas in Connecticut; however, the heaviest rainfall often occurs inland. Therefore, inland areas are vulnerable to riverine and urban flooding during a hurricane.

The official Atlantic hurricane season begins on June 1 and extends through November 30 of each year, although occasionally hurricanes occur outside this period.

3.3.2 Capabilities

Flood Mitigation

Mitigation measures appropriate for flooding have been discussed in Section 3.1.2. These include the ordinances, codes, and regulations that have been enacted to minimize flood damage. In addition, various structures exist to protect certain areas, including dams and riprap.

High Wind Mitigation

Wind loading requirements are addressed through the state building code. The State Building Code has been amended several times in the past two decades. The 2005 Code was amended in 2009, 2011, and 2013. The code was then updated and amended in 2016, with the current code having been updated and effective as of October 1, 2018. The code specifies the design wind speed for construction in all the Connecticut municipalities. Effective October 1, 2018 the ultimate design wind speed for the Town of Sherman is 105 mph for a Category 1 event, 115 mph for a category 2, and 120mph for a Category 3, 4 or 5 hurricane event.

Eversource Energy (formerly Connecticut Light & Power), the local electric utility, provides tree maintenance near its power lines. Eversource was under intense scrutiny after storms Irene and Alfred in 2011, and again after Tropical Storm Isaias in 2020. Town officials have indicated in the past that the Eversource liaison to the Town has been “outstanding.” The liaison sends a report to the Town prior to every major storm, and the First Selectman is able to send him a text-message directly whenever issues arise. The First Selectman uses his Twitter account to publicize information he receives from Eversource about the status of repair projects and other important news.

After the damaging storms of 2011 and 2012, the power companies (CL&P and then Eversource) performed extensive tree trimming and removal efforts. Additionally, the Town has a tree warden who, along with the Department of Public Works, monitors and manages dangerous trees. Town officials have in the past reported that the tree maintenance program was strong, and that continuous management of tree problems over the last few years had led to decreasing costs for the program overall. While the program continues to be strong, the impacts that the Emerald Ash Borer has had on the local Ash Tree stock has been devastating, and led to a sharp increase in needs with regards to management of dead and diseased trees. The Town has performed an evaluation and identified over 500 dead Ash Trees located in Town ROW. Although the widespread death of Ash Trees poses a new challenge for the Town, its robust and consistent monitoring and maintenance program continues to be an important capability.

One ongoing challenge is that many trees that currently pose a threat to roads and powerlines are located beyond the Town’s and the power company’s Rights of Way (ROW). The Town tree warden encourages residents and private associations to cut trees that can be dangerous to power lines, but does not have a mechanism for enforcing those practices.

Utilities in new subdivisions must be located underground whenever possible in order to mitigate storm-related damages.

Sherman has designated Colonial Park, off Route 39 next to the Holy Trinity Church, as a debris collection area to stage debris cleared from roads and properties following a storm event. Having this site designated accelerates cleanup efforts, allowing roads to be opened and power restored more quickly.

During emergencies, the Town currently has two designated emergency shelters available (Section 0). The Sherman Emergency Services Facility is the primary shelter with the secondary shelter being Sherman Consolidated School. Both facilities have generators. In addition, the Town has additional facilities available that could be converted to additional shelter space if the need arose. As hurricanes generally pass an area within a day's time, additional shelters can be set up after the storm as needed for long-term evacuees.

The Town relies on Twitter, radio, television, area newspapers, and the internet to spread information on the location and availability of shelters. It is understood that several of these information sources can be cut off due to power failure, so emergency personnel can also pass this information on manually. The two local newspapers are printed too infrequently to reliably publish shelter information prior to most hazard events, although they can be used for those hazards with a long lead time, such as hurricanes. Prior to severe storm events, the Town ensures that warning/notification systems and communication equipment are working properly and prepares for the possible evacuation of impacted areas. Communication capabilities are discussed in more detail in Section 0.

Actions Completed and New Capabilities

Sherman continues to strengthen its hurricane and tropical storm mitigation capabilities. Local implementation of the updated State Building Code, ongoing analysis of its coordination with Eversource, and assessment of the impacts of the Emerald Ash Borer on its tree stock are some of the improvements made in recent years.

In response to reports of residents being unable to call 911, the Town has installed a 911 call box on the front of the firehouse. The call box will automatically dial 911 what picked up. It can be used during phone outages, as well as other emergencies.

Summary

Municipal programs and policies related to tropical storm mitigation include the following: participation in the Eversource liaison program; designation of a tree warden; a tree maintenance and cutting program operated by the tree warden and DPW; designation of a specific post-storm debris collection area; implementation of the most up-to-date Connecticut State Building Code; requiring utilities to be placed underground in new developments; and ensuring that emergency communication systems are operational prior to forecasted storm events.

3.3.3 Vulnerabilities and Risk Assessment

Connecticut is located in FEMA Zone II regarding maximum expected wind speed. The maximum expected wind speed for a three-second gust is 160 miles per hour. This wind speed could occur as a result of either a hurricane or a tornado in western Connecticut and southeastern New York. The American Society of Civil Engineers recommends that new buildings be designed to withstand this peak three-second gust.

Debris such as signs, roofing material, and small items left outside become flying missiles in hurricanes. Extensive damage to trees, towers, aboveground and underground utility lines (from uprooted trees or failed infrastructure), and fallen poles cause considerable disruption for residents. Streets may be flooded or blocked by fallen branches, poles, or trees, preventing egress. Downed power lines from heavy winds can also start fires during hurricanes with limited rainfall. In general, as the residents and businesses of the State of Connecticut become more dependent on the internet and mobile communications, the impact of hurricanes on commerce will continue to increase. A major hurricane has the potential of causing complete disruption of power and communications for up to several weeks, rendering electronic devices and those that rely on utility towers and lines inoperative. According to the Connecticut DEEP, this is a significant risk that cannot be quantitatively estimated.

A primary concern of the Town is of isolation of neighborhoods due to downed trees and debris. Town staff have identified two specific areas of concern, beyond those roads and neighborhoods listed in Section 3.1.3 as being of concern related to isolation due to flooding:

- Wanzer Hill Road comes off the east side of Route 39 south of downtown, near Squantz Pond. The road is the only access point for the hundreds of properties in the Wanzer Hill neighborhood, and is relatively wooded.
- Coburn Road East extends west off Route 37 north of Lake Mauweehoo. While this road only leads to approximately seven homes, it is heavily wooded. Flooding of the road and isolation of the neighborhood beyond is a concern.

Town staff report that dead Ash trees, killed by the invasive Emerald Ash Borer beetle, are becoming a challenge with regards to tree and limb maintenance; the quantity of dead trees creating a fall risk is beginning to get beyond the scope of the Town's tree maintenance budget.

The town of Sherman is vulnerable to hurricane damage from wind and flooding and from any tornadoes accompanying the storm. In fact, most of the damage to the town from historical tropical cyclones has been due to the effects of flooding. Fortunately, Sherman is less vulnerable to hurricane damage than coastal towns in Connecticut because it does not need to deal with the effects of storm surge. Factors that influence vulnerability to tropical cyclones in the town include building codes currently in place, and local zoning and development patterns and the age and number of structures located in highly vulnerable areas of the community.

Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. There are currently no mobile home parks in the town. Sherman's housing stock consists of historic buildings greater than 50 and sometimes 100 years old, relatively younger buildings built before 1990 when the building code changed to mitigate for wind damage, and relatively recent buildings that utilize the new code changes. Since most of the existing housing stock in the town predates the recent code changes, many structures are highly susceptible to roof and window damage from high winds. In addition, the few homes located within SFHAs are at risk from flooding as a result of the heavy rainfall that typically occurs during tropical storms and hurricanes.

All areas of growth and development increase the town's vulnerability to natural hazards such as hurricanes.

It is not believed that any town-owned critical facilities have any mitigation measures installed to reduce the effects of wind, so all critical facilities are as likely to be damaged by hurricane-force winds as any other.

As the town of Sherman is not affected by storm surge, hurricane sheltering needs have not been calculated by the U.S. Army Corps of Engineers for the town. The town of Sherman determines sheltering need based upon areas damaged or needing to be evacuated within the city. Under limited emergency conditions, a high percentage of evacuees will seek shelter with friends or relatives rather than go to established shelters. During extended power outages, it is believed that only 10% to 20% of the affected population of the town will relocate, while most will stay in their homes until power is restored. In the case of a major (Category Three or above) hurricane, it is likely that the town will depend on state and federal aid to assist sheltering displaced populations until normalcy is restored.

In August 3rd, Tropical Storm Isaias struck Sherman, taking down tree limbs and power lines, leading to a reported 60% of customers losing power. The outage lasted up to one full week. Some residents were unable to call 911 because of downed phone lines and cellular service outages. The Town used its Nixle service to alert residents ahead of the storm.

3.4 SUMMER STORMS AND TORNADOES

3.4.1 Setting

Summer storms and tornadoes have the potential to affect any area within the Town of Sherman. Because these types of storms and the hazards that result (flash flooding, wind, hail, and lightning) might have limited geographic extent, it is possible for a summer storm to harm one area within the Town without harming another.

Thunderstorms occur on 18 to 35 days each year in Connecticut. In general, thunderstorms in Connecticut are more frequent in the western and northern parts of the state, and less frequent in the southern and eastern parts. Although lightning is usually associated with thunderstorms, it can occur on almost any day. The likelihood of lightning strikes in the Sherman area is very high during any given thunderstorm although no one area of the town is at higher risk of lightning strikes.

Based on the historic record, it is considered highly likely that a summer storm that includes lightning will impact the Town of Sherman each year although lightning strikes have a limited effect. Strong winds and hail are considered likely to occur during such storms but also generally have limited effects. A tornado is considered a possible event in Litchfield County each year that could cause significant damage to a small area.

3.4.2 Capabilities

Warning is the primary method of existing mitigation for tornadoes and thunderstorm-related hazards. The NOAA National Weather Service issues watches and warnings when severe weather is likely to develop or has developed, respectively.

Although tornadoes pose a threat to all areas of the state, their occurrence is not considered frequent enough to justify the construction of tornado shelters. Instead, the State has provided NOAA weather radios to all public schools as well as many local governments for use in public buildings. The general public continues to rely on mass media for knowledge of weather warnings. Warning time for tornadoes is very short due to the nature of these types of events, so pre-disaster response time can be limited. However, the NOAA weather radios provide immediate notification of all types of weather warnings in addition to tornadoes, making them very popular with communities.

Aside from warnings, several other methods of mitigation for wind damage are employed in Sherman. Continued location of utilities underground is an important method of reducing wind damage to utilities and the resulting loss of services. The Connecticut Building Codes include guidelines for Wind Load Criteria that are specific to each municipality as explained in Section 3.3.2. In addition, specific mitigation measures address debris removal and tree trimming.

In the town of Sherman, the local utilities are responsible for tree branch removal and maintenance above and near their lines. The Town also performs tree branch trimming along town roads and on town property. In addition, all new developments in Sherman must place utilities underground wherever possible. The Tree Warden also approaches residents on a case-by-case basis when trees and branches on their property look hazardous, though ultimately tree removal on private property is up to the property owner.

Most downed power lines in Sherman are detected quickly and any associated fires are quickly extinguished.

Municipal responsibilities relative to tornado mitigation and preparedness include:

- Developing and disseminating emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures and locations of public shelters.
- Designate appropriate shelter space in the community that could potentially withstand tornado impact.
- Periodically test and exercise tornado response plans.
- Put emergency personnel on standby at tornado "watch" stage.

Actions Completed and New Capabilities

Sharon has been working diligently to educate residents about the danger of coming into contact with power lines, either those knocked down during a storm event or those near trees and limbs that residents may be trimming. The First Selectman has sent out Nixle notifications about this danger, written columns about it in the local weekly paper, and has generally been working to increase awareness. One resident of neighboring New Milford was killed by a live electric wire after a downburst in 2014.

Sherman continues to strengthen its warning and recovery capabilities by improving social media emergency notifications, designating a debris collection area, and actively communicating with Eversource.

Summary

Sherman's capabilities with regards to summer storms and tornadoes include: ensuring communication systems are operational prior to forecast storms; broadcasting storm warning information; disseminating tornado safety information and evacuation procedures; designating tornado-resistant public shelters; periodic testing of tornado response plans; putting emergency personnel on standby at tornado "watch" stage; a municipal tree maintenance program; a post-storm debris removal program and designated collection area; requiring buildings meet the Connecticut State Building Code; requiring new developments place utilities underground; and warning landowners when dangerous trees are spotted by the tree warden on private property.

3.4.3 Vulnerabilities and Risk Assessment

By virtue of its location in Fairfield County (moderate risk), but adjacent to Litchfield County (high risk) and Dutchess County (moderate risk), the town of Sherman is at a moderate to high risk for tornadoes. NOAA states that climate change has the potential to increase the frequency and intensity of tornadoes, so it is possible that the pattern of occurrence in Connecticut could change in the future.

In general, thunderstorms and hailstorms in Connecticut are more frequent in the western and northern parts of the state, and less frequent in the southern and eastern parts. Fairfield County experiences an average of 7.5 severe, damaging thunderstorms per year. Although lightning is usually associated with thunderstorms, it can occur on almost any day. The likelihood of lightning strikes in the Sherman area is very high during any given thunderstorm although no one area of the town is at higher risk of lightning strikes. The risk of at least one hailstorm occurring in Sherman is considered moderate in any given year.

Most thunderstorm damage is caused by downbursts, or straight-line winds, exceeding 100 mph. A downburst is a severe localized wind blasting down from a thunderstorm. Downburst wind speeds can exceed 165 miles per hour. The risk of downbursts occurring during such storms and damaging the town of Sherman is believed to be low for any given year; however, Sherman is particularly susceptible to damage from high winds due to its high elevation and heavily treed landscape. A downburst struck Sherman in August of 2010, and again in 2014, when straight-line winds knocked over trees and utility poles, taking out power, closing roads, and causing the electrocution death of a man in neighboring New Milford. In May of 2018, a microburst downed many trees, causing damage to houses and blocking roadways. Extensive power outages occurred in the south end of Town, lasting for about four days.

Secondary damage from falling branches and trees is more common than direct wind damage to structures. Heavy winds can take down trees near power lines, leading to the start and spread of fires. Such fires can be extremely dangerous during the summer months during dry and drought conditions.

According to Town personnel, no single area of town is more susceptible to wind damage than any other. Secondary damage from falling branches and trees is more common than direct wind damage to structures. The most significant vulnerability in Sherman to summer storms is loss of power or access to isolated areas due to downed trees on power lines and roads.

Summary

The entire community is at relatively equal risk for experiencing damage from summer storms and tornadoes. Based on the historic record, only a few summer storms and tornadoes have resulted in costly damages in Sherman. Most damages are relatively site-specific and occur to private property (and therefore are paid for by private insurance). For municipal property, the budget for tree removal and minor repairs may need to be adjusted from time to time to address storms. The main concern with regards to summer storms and tornadoes is the impact of downed trees on access to isolated areas, and power outages.

3.5 WINTER STORMS AND NOR'EASTERS

3.5.1 Setting

The entire town of Sherman is susceptible to winter storms and, due to its high elevation, can have higher amounts of snow than surrounding communities. In general, winter storms are considered highly likely to occur each year (major storms are less frequent), and the hazards that result (nor'easter winds, snow, and blizzard conditions) can potentially have a significant effect over a large geographic area.

Most winter weather events occur between December and March, although in 2011 Connecticut experienced a significant October snowstorm that left much of the state without power for a week. Winter weather may include snow, sleet, freezing rain, and cold temperatures.

3.5.2 Capabilities

Hazard mitigation programs specific to winter storms are generally those related to preparing plows, sand and salt trucks; tree-trimming to protect power lines; and other associated snow removal and response preparations.

Sherman ensures that all warning/notification and communications systems are ready before a storm, and ensures that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order. The Town also prepares for the possible evacuation and sheltering of some populations which could be impacted by the upcoming storm (especially the elderly and special needs persons).

The amount of snowfall in Sherman is elevation-dependent during storms. The Town of Sherman primarily uses town staff for plowing operations. The town utilizes plow trucks to clear and treat all town-owned roadways, properties, and sidewalks. The Connecticut Department of Transportation plows Routes 37, 39, and 55. Private communities are responsible for plowing their own roads. During emergencies, a plow vehicle can be dispatched ahead of an emergency vehicle.

The Town of Sherman prioritizes plowing routes to ensure access to and from critical facilities and shelters. Plow routes are posted in Town buildings for public viewing. It is recognized that

plowing critical facilities may not be a priority to all residents as people typically expect their own roads to be cleared as soon as possible.

The 2018 Connecticut Building Code specifies that a pressure of 35 pounds per square foot (psf) be used in Sherman as the base "ground snow load" for computing snow loading for different types of roofs.

Actions Completed and New Capabilities

Sherman's winter storm mitigation capabilities continue to be significant, although there has not been a significant change in these capabilities since the previous HMP was adopted.

Summary

Programs and policies relevant to winter storm mitigation include utilization of Town staff for most plowing operations (it is the responsibility of the state, Town, and private communities to clear state, Town, and private roads respectively), ensuring communication systems and snow clearing equipment are all prepared prior to forecast storm events, prioritizing plowing routes; and maintaining trees and limbs along roads and power lines.

3.5.3 Vulnerabilities and Risk Assessment

The heavily treed landscape in close proximity to populated residential areas in the Town of Sherman poses problems in relation to blizzard condition damage. Tree limbs and some building structures may not be suited to withstand high wind and snow loads. Ice can damage or collapse power lines, render steep gradients impassable for motorists, undermine foundations, and cause "flood" damage from freezing water pipes in basements.

In addition, winter storms present additional problems for motorists all over the state. As the population of Connecticut and its dependence on transportation continues to increase, the vulnerability of the state to winter storms also increases. There is a high propensity for traffic accidents and traffic jams during heavy snow and even light icing events. Roads may become impassable, inhibiting the ability of emergency equipment to reach trouble spots and the accessibility to medical and shelter facilities. Stranded motorists, especially senior and/or handicapped citizens, are at particularly high risk of injury or death from exposure during a blizzard. After a storm, snow piled on the sides of roadways can inhibit line of sight and reflect a blinding amount of sunlight. When coupled with slippery road conditions, poor sightlines and heavy glare create dangerous driving conditions.

Icing causes difficult driving conditions throughout the hillier sections of Sherman, but Town personnel note that there are no unusual areas or particular "trouble spots" in town for icing. The largest problems occur on narrow, steeply sloped private roads. Fortunately, many of these roads contain seasonal cottages that are unoccupied during the winter months. Drifting snow is not as large a problem in Sherman as other areas, but it still occurs. This problem is mitigated through municipal plowing efforts. Ice jams are not a problem along the rivers in Sherman.

It is possible that several hundred of the population impacted by a severe winter storm could consist of the elderly, a small number could consist of linguistically isolated households, and several hundred could be disabled. Thus, it is important for Sherman's emergency personnel to

be prepared to assist these functional needs populations during emergencies such as winter storms.

One specific hazard that has been identified by Town personnel is winter fires. Personnel reflected that there is at least one structure fire each year during the coldest part of the year. These fires are particularly difficult to fight for two reasons: first, road conditions can make access difficult; and second, when water is hosed onto the fire in very cold temperatures, it freezes and turns to mist.

Recent climate change studies predict a shorter winter season for Connecticut (as much as two weeks) and less snow-covered days with a decreased overall snowpack. These models also predict that fewer, more intense precipitation events will occur with more precipitation falling as rain rather than snow. This trend suggests that future snowfalls will consist of heavier (denser) snow and the potential for ice storms will increase. Such changes will have a large impact on how the State and its communities manage future winter storms, and the impact such storms have on the residents, roads, and utilities in the State.

Summary

The entire community is at relatively equal risk for experiencing damage from winter storms, although some areas may be more susceptible. Many damages are relatively site-specific and occur to private property (and therefore are paid for by private insurance), while repairs for power outages is often widespread and difficult to quantify to any one municipality. For municipal property, the budget for plowing and minor repairs is generally adequate to handle winter storm damage, although the plowing budget is often depleted in severe winters. In particular, the heavy snowfalls associated with the winter of 2010-2011 drained the local plowing budget and raised a high level of awareness of the danger that heavy snow poses to roofs, as did the snow associated with Winter Storm Alfred in October 2011 and storm Nemo in February 2013.

3.6 WILDFIRES AND DROUGHT

3.6.1 Setting

Wildfires are any non-structure fire, other than a prescribed burn, that occurs in undeveloped areas. Although the term brings to mind images of tall trees engulfed in flames, wildfires can occur as brush and shrub fires, especially under dry conditions. Wildfires are also known as "wildland fires."

The Town of Sherman is considered a low-risk area for wildfires. Wildfires are of particular concern in the many wooded areas and other areas with poor access for fire-fighting equipment. Hazards associated with wildfires include property damage and loss of habitat. Wildfires are considered a likely event each year, but when one occurs it is generally contained to a small range with limited damage to non-forested areas.

Sherman has a particular vulnerability to fire hazards where urban development and wildland areas are in close proximity. The "wildland/urban interface" is where many such fires are fought. Wildland areas are subject to fires because of weather conditions and fuel supply. An isolated wildland fire may not be a threat, but the combined effect of having residences, businesses, and lifelines near a wildland area causes increased risk to life and property. Thus, a fire that might

have been allowed to burn itself out with a minimum of firefighting or containment in the past is now fought to prevent fire damage to surrounding homes and commercial areas as well as smoke threats to health and safety in these areas.

In addition, Sherman, and Fairfield County overall, has experienced drought challenges over recent years. The U.S. Drought Monitor (USDM), which has been monitoring nationwide drought conditions since 2000, estimates that over the past two decades Connecticut experienced its longest drought of 46 weeks beginning June 21, 2016 and lasting until May 2, 2017. It was also estimated that the most intense period of this extended drought occurred the week of November 15, 2016, where approximately 44.5% of Connecticut lands were impacted. Figure 3-1: USDM Drought Time Series for Fairfield County depicts the various drought conditions in Fairfield County since 2000, where the warmer colors represent more advanced drought stages.

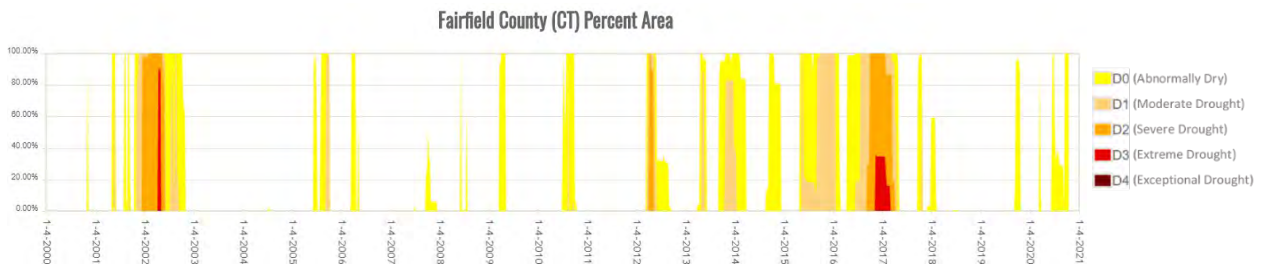


Figure 3-1: USDM Drought Time Series for Fairfield County

The 2019 Connecticut Natural Hazard Mitigation Plan assumes that the State of Connecticut has a medium probability of future drought events. This assumption is based on climate change projections anticipating hotter and wetter conditions in the near future. Climate forecasts often suggest that while precipitation may increase, the overall pattern will generally be higher intensity storms, with longer than average dry periods between events. The State Plan also identifies that Fairfield County accounts for roughly 7.34% of the state's total number of farms, with a market value of over \$34 million in product sold from these farms.

3.6.2 Capabilities

Existing mitigation for wildland fire control is typically focused on Fire Department training and maintaining an adequate supply of equipment. The Town has an ordinance requiring the creation of dry hydrants for residential or commercial building developments, with pertinent water sources being either underground storage tanks or surface water supplies. This ordinance is enforced by the Planning and Zoning Commission. In addition, new roads, subdivisions, and fire ponds are required to allow for fire truck access.

Unlike wildfires on the west coast of the United States where the fires are allowed to burn toward development and then stopped, the Sherman Volunteer Fire Department goes to the fires whenever possible. This proactive approach is believed to be effective for controlling wildfires. The Fire Department has some water storage capability in its tanker trucks but primarily relies on the use of 27 water sources (fire ponds or water tanks) to fight fires throughout town.

The Sherman Fire Department has a four-wheel drive brush truck and a gator capable of accessing remote locations with firefighting water. Fire Department apparatus also include one fire engine, one rescue pumper, one tanker truck, one brush truck, and a portable light tower. Since adoption of the initial Plan, the Town retired two old fire engines and purchased a new replacement rescue pumper (as listed).

The Town also has mutual aid agreements with all of its neighbors. Finally, The Connecticut DEEP Division of Forestry monitors the weather each day during non-winter months as it relates to fire danger. The Division utilizes precipitation and soil moisture data to compile and broadcast daily forest fire probability forecasts. Forest fire danger levels are classified as low, moderate, high, very high, or extreme. In addition, the NWS issues a Red Flag warning when winds will be sustained or there will be frequent gusts above a certain threshold (usually 25 mph), the relative humidity is below 30%, and precipitation for the previous five days has been less than one-quarter inch. Such conditions can cause wildfires to quickly spread from their source area. This allows the DEEP and the Town of Sherman to monitor the drier areas of the state to be prepared for forest fire conditions.

The Connecticut DEEP Open Burning Program requires individuals to be nominated and designated by the Chief Executive Officer in each municipality that allows open burning to take an online training course and exam to become certified as an "Open Burning Official." Sherman has designated the Town Fire Marshall as the Open Burning Official. In this position, he will make no-burn declarations and will withhold open burning permits when necessary. The First Selectman informs the public about no-burn declarations via Twitter.

Actions Completed and New Capabilities

The Fire Department continuously reviews its protocols, and completes a cold-weather training every year to address that specific challenge (as noted in the Vulnerabilities and Risk Assessment, below).

Since the previous HMP was adopted, the Fire Department has installed 13 dry hydrants in waterbodies off of Wakeman hill Road near Bridgeworth Land, in the Deer Pond Farm area. The Town has formed a committee to address hydrant and tank maintenance issues.

Summary

In summary, Sherman programs that mitigate wildfire hazards include: adding firefighting water supplies to areas currently underserved; intermunicipal firefighting coordination; public outreach and education about fire safety and outdoor burning; patrolling public spaces to monitor campfires; and participation in the Connecticut Open Burning program. Policies include requiring fire ponds with dry hydrants and water tanks to be installed at new subdivisions, requiring that roads are constructed to allow firefighting vehicles access at new subdivisions, and proactively going to fires when possible rather than letting them burn.

3.6.3 Vulnerabilities and Risk Assessment

Much of Sherman is privately and publicly owned forest and fires have occurred throughout the town. The Sherman Volunteer Fire Department responded to 800 fire-related calls from 2001 to 2009, equating to an average of 88 calls per year. While not all of these calls were related to

wildfires, the call volume suggests that fire in general is a relatively common and persistent hazard in the town of Sherman.

Small brush fires occur seasonally in Sherman, but the Town has not experienced any fires in Town that burned over an acre in recent years. In September of 2015, Sherman's fire department responded to a significant wildfire in neighboring New Fairfield. Thirty-five fire departments responded to help fight the fire. Twenty-eight acres of State forest-land was burned. The plume was 3,000 feet high. The blaze was first discovered on a Saturday covering 10 acres, was fought, and was thought to be controlled. On Sunday it had spread more. No losses to structures or vehicles were experienced, with a minor amount of lost gear and supplies. Wildfire Risk Areas are mapped in Figure 3-2.

Most wildfires in Connecticut are relatively small. In the drought year of 1999, the average wildfire burned five acres in comparison to the two most extreme wildfires recorded since 1986 that burned 300 acres each. Given the availability of firefighting water in the town, including the use of nearby water bodies, and longstanding mutual aid assurances the Sherman Volunteer Fire Department has with neighboring communities, it is believed that this average value for a drought year and the extreme value are applicable to the town as well. Indeed, Town personnel report that in a typical year, the largest fires only burn a couple of acres before being contained despite the rural nature of the town.

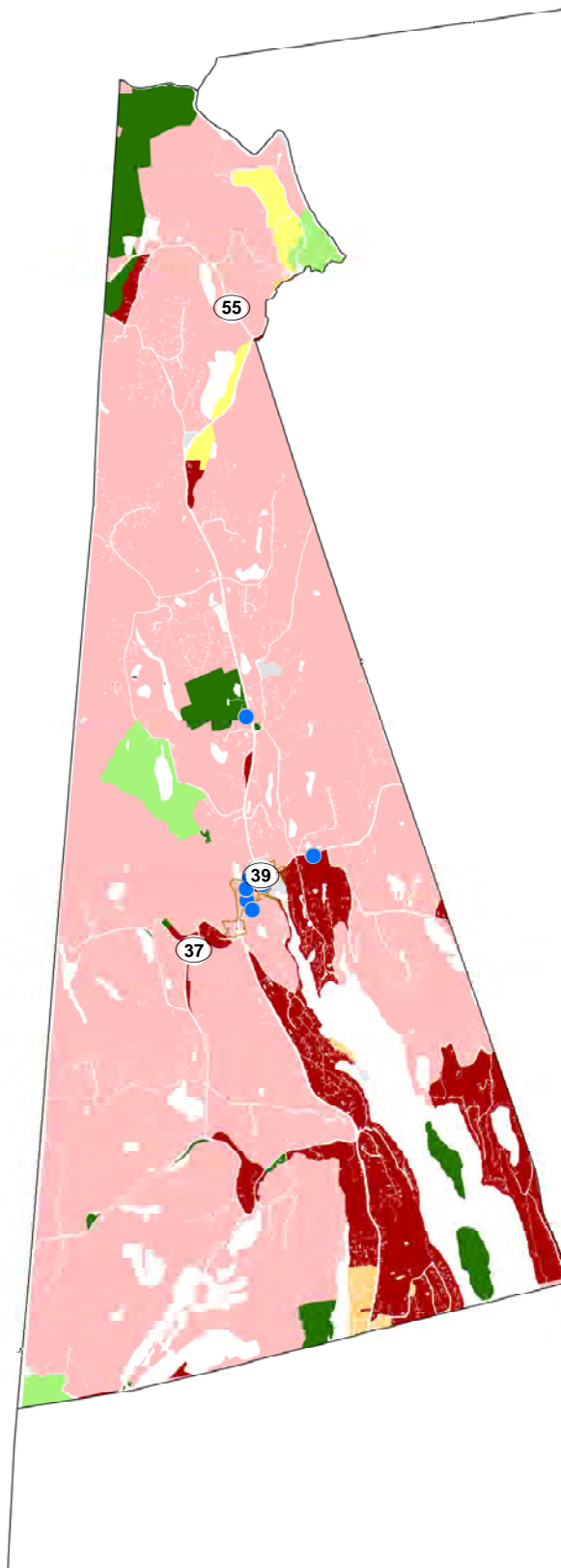
There are limited public camping areas in town, so there are few fires caused by out of control campfires. The only state park in town is the Pootatuck State Forest along Candlewood Lake in southern Sherman, but there is no vehicular access within Sherman. Town personnel report that the larger private tracts of forest do not tend to attract children. As much of the town has firefighting water available nearby in the form of fire ponds, a large amount of water can be made readily available for firefighting equipment.

Nevertheless, the Town of Sherman believes that there are weaknesses in its firefighting capability. The Fire Department relies on the relative water levels in Candlewood Lake and other smaller water bodies in the town. While the 27 water sources in Town provide a large area of Town with potential firefighting water, there are still many areas not served by a formal water source. During the summer months, many smaller streams in Sherman dry up and cannot be used as water sources.

In addition, there are many areas of town where roads are narrow and one way. This hinders emergency access to fight fires. This is a particular problem within many of the private community associations. Fire trucks often need to drive into such areas in line with the last one in being the first one to back out as there is no place to turn around. In other places, fire trucks simply can't get to the houses that are up narrow dirt roads and driveways.

Legend

- Critical Facilities
- Cultural District
- Low Risk Wildfire
- High & Med. Density Developed Intermix
- Low Density Developed Intermix
- High & Med. Density Developed Interface
- Low Density Developed Interface
- Very Low Density Developed and some Wildfire Prone Vegetated
- Uninhabited and Vegetated



**MILONE &
MACBROOM**
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

Wildland-Urban Interface: Wildfire Risk Areas

WestCOG Hazard Mitigation Plan
Town of Sherman

NPS: Cultural Resources
Wildland-Urban Interface:USFA



0 3,500 7,000
Feet

SCALE 1" = 7,447'

DATE 11/13/2020

3101-22
PROJ. NO.

FIG. 3-2

In addition, there is concern about fires in the wooded southwestern, western, and northwestern sections of town where there is limited firefighting water available. While fires are infrequent in these areas, they can often be difficult to access and fight. The Town has the support of the owners of the tracts of open space to provide access to their lands in case of a wildfire.

It is possible that several hundred of the population impacted by a wildfire could consist of the elderly, a small number could consist of linguistically isolated households, and several with disabilities could reside near wildfire impact areas. Thus, it is important for the Sherman Fire Department to be prepared to assist these special populations during emergencies, including wildfire.

In summary, the highest risk areas for wildfires in Sherman are associated with agricultural fields or pastures. As each area borders residential sections of the town, residents on the outskirts of these risk areas are the most vulnerable to fire, heat, and smoke effects of wildfires. Despite having a large amount of forest/suburban interface, the overall risk of wildfires occurring in the town of Sherman is considered to be low. Such fires fail to spread far due speed of detection and strong fire response.

Should a wildfire occur, it seems reasonable to estimate that the average area to burn would be five acres during a drought period and one to two acres during wetter periods, consistent with the state averages. In the case of an extreme wildfire during a long drought on forested lands, it is estimated that up to 300 acres could burn before containment due to the limited access of those lands. Residential areas bordering such lands would also be vulnerable to wildfire, but would likely be more impacted by heat and smoke than by structure fires due to the strong fire response in the town.

3.7 EARTHQUAKES AND LANDSLIDES

3.7.1 Setting

The entire town of Sherman is susceptible to earthquakes. However, even though earthquakes have the potential to occur anywhere both in the Town and in the northeastern United States, the effects may be felt differently in some areas based on the type of geology. In general, earthquakes are considered a hazard that may possibly occur but that may cause significant effects to a large area of the Town.

3.7.2 Capabilities

The Connecticut State Building Code includes design criteria for buildings specific to each municipality. These include Maximum Considered Earthquake Spectral Acceleration coefficients and Seismic Design Categories for building design in the town of Sherman. In the 2016 code, these parameters are 0.202 percent-gravity for "short period spectral acceleration," and 0.066 percent-gravity for "one-second spectral acceleration." The Town has adopted these codes for new construction, and they are enforced by the Town Building Official.

Due to the infrequent nature of damaging earthquakes, land use policies in the town of Sherman do not directly address earthquake hazards. However, the Subdivision Regulations of the Town of Sherman (In Section 3.7.2) prohibits development on slopes greater than 25%. The Town reserves

the right to impose more stringent regulations on a site to maintain the stability of the bank under the proposed conditions.

Actions Completed and New Capabilities

Earthquake mitigation capabilities have not significantly changed in Sherman in recent years, and are deemed to be sufficient given the low risk of a hazardous event.

Summary

Town policy is to enforce Connecticut State Building Code design guidelines, and to prohibit development on very steep slopes. The Town will continue to evaluate whether capabilities need to be strengthened in the future.

3.7.3 Vulnerabilities and Risk Assessment

According to the USGS, Connecticut is at a low risk for experiencing a damaging earthquake. The USGS has determined that Connecticut has a 10% chance that at some point in a 50-year period an earthquake would cause peak acceleration (ground shaking) values of 4% to 8% of the force of gravity. To appreciate why these values of ground shaking are expressed as a percentage of the force of gravity, note that it requires more than 100% of the force of gravity to throw objects up in the air.

In terms of felt effects and damage, ground motion at the level of several percent of gravity corresponds to the threshold of damage to buildings and houses (an earthquake intensity of approximately V). For comparison, reports of "dishes, windows and doors disturbed" corresponds to an intensity of about IV, or about 2% of gravity. Reports of "some chimneys broken" correspond to an intensity of about VII, or about 10% to 20% of gravity. According to the USGS National Seismic Hazard Mapping Project (2008), an earthquake impacting the town of Sherman has a 2% chance of exceeding a peak acceleration of 10-12% of the force of gravity in a 50-year period.

Four faults are mapped in the town of Sherman. These faults occur along the geologic contacts of the Manhattan Schist throughout the Town and are believed to be inactive.

Surficial earth materials behave differently in response to seismic activity. Unconsolidated materials such as sand and artificial fill can amplify the shaking associated with an earthquake. In addition, artificial fill material has the potential for liquefaction. When liquefaction occurs, the strength of the soil decreases, and the ability of soil to support building foundations and bridges is reduced. Increased shaking and liquefaction can cause greater damage to buildings and structures and a greater loss of life.

Liquefaction is a phenomenon in which the strength and stiffness of a soil are reduced by earthquake shaking or other rapid loading. It occurs in soils at or near saturation and especially in finer textured soils.

Several areas in the town of Sherman are underlain by sand and gravel, such as areas along Route 39 north of the town center. Structures in these areas are at increased risk from earthquakes due to amplification of seismic energy and/or collapse. Areas underlain by glacial till are not at increased risk during an earthquake. Glacial tills contain an unsorted mixture of clay, silt, sand,

gravel, and boulders deposited by glaciers as a ground moraine. Till is present throughout Sherman, with deposits concentrated near the Housatonic River and its tributaries in northern Sherman, and around the lower parts of Sawmill Brook in the central valley of Sherman.

Areas of steep slopes can collapse during an earthquake, creating landslides. Seismic activity can also break utility lines such as water mains, electric and telephone lines, and stormwater management systems. Damage to utility lines can lead to fires, especially in electric and gas mains. Dam failure can also pose a significant threat to developed areas during an earthquake.

A series of earthquake probability maps were generated using the 2009 interactive web-based mapping tools hosted by the USGS. These maps were used to determine the probability of an earthquake of greater than magnitude 5.0 or greater than magnitude 6.0 damaging the town of Sherman. Results are presented in Table 3-3 below.

Table 3-3: Probability of a Damaging Earthquake in the Vicinity of Sherman

Timeframe (Years)	Probability of the Occurrence of an Earthquake Event > Magnitude 5.0	Probability of the Occurrence of an Earthquake Event > Magnitude 6.0
50	2% to 3%	< 1%
100	4% to 6%	< 1%
250	10% to 12%	2% to 3%
350	12% to 15%	3% to 4%

Based on the historic record and the probability maps generated from the USGS database, the State of Connecticut has areas of seismic activity. It is likely that Connecticut will continue to experience minor earthquakes (magnitude less than 3.0) in the future. While the risk of an earthquake affecting Sherman is relatively low over the short-term, long-term probabilities suggest that a damaging earthquake (magnitude greater than 5.0) could occur within the vicinity of Sherman.

Because a damaging earthquake would likely affect a large area beyond Beacon Falls, it is likely that the community may not be able to receive regional aid for a few days. It is important for municipal facilities and departments to have adequate backup plans and backup supplies to ensure that restoration activities may begin and continue until outside assistance can be provided.

Summary

Despite the low probability of occurrence, earthquake damage presents a very real hazard to the town of Sherman. However, it is very unlikely that the town would be at the epicenter of such a damaging earthquake. Should a damaging earthquake occur in Connecticut, it is likely that Sherman medical personnel will be needed in other parts of the state that are harder hit by the earthquake.

4.0 MITIGATION STRATEGIES AND ACTIONS

4.1 Goals and Objectives

Municipal goals and objectives have been made consistent regionally and are presented in the Multi-Jurisdictional Plan document.

4.2 Status of Mitigation Strategies and Actions from Previous HMP

The table below lists the mitigation actions developed in the previous HMP and the status of each. Actions to be carried forward are noted as such. Actions that have been institutionalized as capabilities are not carried forward.

#	Action	Responsible Party	Status	Notes
1	Add pages to town website dedicated to citizen education and preparation for natural hazard events	OEM	Complete	The Town has added an Office of Emergency Management page to the Town webpage, which provides information about how the Town prepares for disasters, and contact information. The Town also has the ability to post updates about specific disasters on the Town website, or to create a page dedicated to information about a specific event.
2	Implement the Everbridge emergency notification system	OEM	Complete	Town has implemented the Everbridge program "Nixle."
3	Upgrade the unpaved portions of Jericho Road North to provide additional egress north from the Town Center	DPW	Complete	This action has been completed
4	Modify the Plan of Conservation and Development and Subdivision Regulations to encourage two modes of egress into new neighborhoods	PZC	Drop	Sherman has not experienced any new subdivisions in many years, and does not expect significant new development in the future based on growth projections and geography; the town no longer believes that pursuit of this action will accomplish hazard mitigation goals.
5	Pursue funding to place utilities underground in existing developments	DPW	Carry Forward	Town has not succeeding in securing funding for this effort, as it has placed a higher priority on working with the local energy utility Eversource to improve communication and outage response procedures. Action is carried forward.

#	Action	Responsible Party	Status	Notes
6	Post emergency shelter information on the new, overhauled website	OEM	Capability	Town posts, and otherwise communicates, information about emergency shelters on the Town Website, as well as via other outlets, as needed.
7	Pressure local cellular providers to improve resilience of the local network after events	First Selectman	Complete	Town has good relationships and communication pathways with its local utility providers, including telecommunication companies. Additionally, the Town is working on improving cellular coverage; a Town committee has been assembled and meets monthly to work on this. Additional cell towers are expected to be installed in coming years as a result of these efforts. This action is considered completed.
8	Complete construction of a new Public Works wash-station	DPW	Complete	This action has been completed.
9	Determine and implement a means of lowering sodium levels in the water at the Town Center	DPW	Complete	Sherman retained a consultant to perform a groundwater analysis and help the Town identify strategies for mitigating sodium levels in its water. As a result of this work, the Town has implemented a series of best practices to minimize sodium inputs, and has installed a second well at the emergency services building. Groundwater studies and monitoring are ongoing. This action is completed.
10	Amend Town regulations to explicitly require new developments to create a zero-increase in stormwater runoff from sites	PZC	Complete	A zero runoff increase requirement has been added to the Town regulations.
11	Pursue/allocate funding to repair the bridge over Tollgate Brook on Old Greenwoods Road	DPW	Complete	Bridge has been repaired.
12	Repair or upgrade the Wagon Wheel Road culvert at Glen Brook	DPW	Complete	Culvert has been repaired.

#	Action	Responsible Party	Status	Notes
13	Perform a bridge evaluation of Old Greenwood Road Extension where it crosses Tollgate Brook	DPW	Complete	Evaluation completed, bridge repaired.
14	Perform a bridge evaluation of George Road	DPW	Drop	There is no George Road in Sherman – action seems to be an error.
15	Conduct engineering studies on Town culverts that are suspected of being undersized	DPW	Carry Forward	The Department of Public Works examines all culverts annually to identify repair or upgrade needs. These examinations are not engineering studies. <i>Action is Carried Forward</i>
16	Reevaluate the drainage computations for public dead-end roads in town that span a watercourse, evaluating the dead-end roads with the most structures at risk first	DPW	Carry Forward	This action has not yet been completed due to funding limitations. Carry forward.
17	Upgrade Town culverts found to be undersized through engineering studies or reevaluated drainage computations. Focus on dead-end roads	DPW	Carry Forward	This action has not yet been completed as it depends on actions 15 and 16. Carry forward.

#	Action	Responsible Party	Status	Notes
18	Designate an additional shelter within Sherman, or direct residents to alternate shelters outside of Sherman, south of the Town Center so that residents who live in that area aren't cut off from the shelter during flood events	OEM	Carry Forward with Revisions	Town has not yet succeeded in identifying an appropriate location to serve as a shelter in the southern part of Town. Residents are directed to alternate shelters to the south of Town. This action is carried forward, and revised to specifically call for identification of locations where temporary shelters or warming shelters can be established in case residents in the southern portion of Town are unable to access other municipal shelters and services.
19	Collaborate with the Stormwise project, participate in education, management, and research efforts, and implement the Stormwise framework on forests adjacent to key roads.	DPW	Drop	<p>Sherman has a tree warden and an active tree management program. Tree management is consistently a challenge, but the Town has increased its tree management budget over the years and feels its capabilities are generally adequate.</p> <p><i>The Town would support a regional action related to mitigating the high quantity of dead Ash trees in town rights-of-way due to the impacts of the Emerald Ash Borer.</i></p>
20	Determine whether development of a microgrid that encompasses the Town Hall, the Library, and the nearby grocery store is feasible.	DPW	Drop	<p>The Fire House / EOC has a generator, and the Town is pursuing installation of a permanent generator or portable generator hook-up at the Town Hall. The Town helped the nearby grocery store upgrade its power source and transformer through Eversource, which makes it less susceptible to outages. These actions have and continue to improve the emergency power capabilities of this area; the Town does not believe pursuit of a microgrid is the best path forward at this time.</p> <p><i>This action is dropped and replaced by two new actions: to install emergency power at the Town Hall and to offer assistance to the grocery store in acquisition of a backup generator.</i></p>

#	Action	Responsible Party	Status	Notes
21	Educate property owners on increasing tree-throw radiuses and encourage them to trim or cut trees that are tall enough to damage property, roads, or powerlines, even if branches are not directly above those assets.	DPW	Carry Forward with Revisions	Subdivision property owners are responsible for maintaining trees along subdivision roads. Downed trees can block access to subdivisions and hinder emergency response. The Town does not believe that the specific issue identified in this action needs to be addressed, but does believe action is needed generally with regard to educating residents about the importance of maintaining trees on their properties, and especially along subdivision roads. Action is carried forward with revisions.
22	Develop an official protocol with Eversource with regards to responding to outages, given the distance between the base location of their crew trucks and Sherman.	First Selectman	Complete	Town has a very good relationship with Eversource, has held several meetings with the company about outage response, and has developed protocols. This is complete.
23	Develop an emergency response plan for the Timber Trails area that addresses the risk of isolation.	OEM	Carry Forward	Town has not yet completed this action as it has focused on more generally improving its emergency response capabilities. Action is carried forward.
24	Evaluate the cost-effectiveness of performing a GPS study of roads in order to prioritize plowing routes, increase efficiency and efficacy of plowing efforts, and help plan evacuation routes.	DPW	Drop	Sherman's snow removal capabilities are sufficient and well organized; the Town does not believe this action is necessary.

#	Action	Responsible Party	Status	Notes
25	Review cold-weather firefighting protocols, and determine if improvements are needed to address the unique challenges of fighting fires at sub-freezing temperatures.	Fire Department	Capability	The Fire Department continuously reviews its protocols, and completes a cold-weather training every year. As an example, in 2019 the department completed an advanced training on firefighter rehabilitation following a firefight, which included cold-weather specific protocols.
26	Purchase a backup generator and have it installed at the Town Hall	First Selectman	Carry Forward with Revisions	The Town has had an electrician assess the Town Hall for emergency power suitability, and determined that installation of a transfer switch to allow for tie-in to a portable generator was the best path forward. This action is carried forward with revisions. <i>Town will check whether a transfer switch has already been installed.</i>
27	Purchase a backup generator and have it installed at the Town Garage	DPW	Complete	This action has been completed
28	Purchase a backup generator and have it installed at the Old Town Hall/Senior Center	First Selectman	Carry Forward	Town has not yet completed this action due to lack of funding. Carry Forward.
29	Purchase a backup generator and have it installed at either the Catholic Church or the Jewish Community Center	First Selectman	Carry Forward	Town has not yet completed this action due to lack of funding. Carry Forward.

#	Action	Responsible Party	Status	Notes
30	Include dam failure areas in the Everbridge emergency notification system, once that system is implemented	OEM	Drop	Town does not believe limiting alerts to specific areas is necessary; in case of a dam failure emergency, Sherman would send a Nexle alert with the relevant information to all subscribers.
31	Place copies of EAP documents in a location that is known to all relevant officials, and ensure those officials continue to be informed as to that location	First Selectman	Carry Forward	Town has EAP documents on file but has not reviewed the locations of these documents to ensure all relevant officials are aware of them, as the relative low risk from dam failure in Sherman, and State programs to monitor dam safety, have not made such an action a high priority. Action is carried forward.
32	Institute a program for monitoring and addressing beaver dams throughout Town	DPW	Capability	The Town monitors and addresses beaver dams on a case-by-case basis as needed through the DPW.
33	Consider the use of beaver deterrent devices such as beaver stops or beaver bafflers.	DPW	Capability	The DPW implements a variety of beaver deterrent devices as appropriate, and has found them to be successful in many cases.
34	Add additional supplies of firefighting water where adequate water supplies do not currently exist. These areas include Briggs Hill Road, Route 37 South between Briggs Hill Road and Wakeman Hill Road, and Wakeman Hill Road near Bridgeworth Lane.	PZC / Fire Dept.	Partially Complete Carry Forward	<p>Progress has been made on this action, and efforts are ongoing. The Town has been and continues to be exploring opportunities for installing dry hydrants in existing ponds. Sherman installed 13 dry hydrants off of Wakeman Hill Road and Chapel Hill Road in the Deer Pond Farm area (identified as "Wakeman Hill Road near Bridgeworth Lane" in the action; Connecticut Audubon Society property).</p> <p>Carry forward for areas listed in action.</p>

#	Action	Responsible Party	Status	Notes
35	Improve the Town's hydrant and tank maintenance program	Fire Department	Capability	Town explored adding a line item related to hydrant and tank maintenance in its annual budget, but determined that it wasn't necessary. Instead, a committee was formed to address hydrant and tank maintenance issues. Additionally, the Fire Department is continuously exploring improvements to its program.
36	Send out a Townwide mailer about indoor fire safety, including the safe use of furnaces, boilers, wood stoves, and fireplaces.	Fire Department	Drop	The Fire Department runs a fire prevention program annually through the high school. Open burning information is posted on the Town website seasonally. A town wide mailer is not believed to be necessary.
37	Implement other fire protection solutions when water main extensions are not feasible, such as the use of fire ponds.	Fire Department	Capability	This is a capability.
38	Perform prescribed burning on municipal land when and where appropriate.	Fire Department	Drop	The Fire Department does not believe performing prescribed burning on municipal land is appropriate for Sherman. Open burning permits may be obtained by private residents by submitting a permit application to the Fire Marshal.

4.3 Prioritization of Strategies and Actions

The STAPLEE method, described in the Multi-Jurisdictional document, was used to score mitigation activities. The STAPLEE matrix in Appendix A provides the total scores. Actions have been further prioritized based on implementation cost, project urgency, and municipal and public input. The strategies below are presented in priority order, with qualitative priority levels listed for each.

4.4 Mitigation Strategies and Actions Implementation Table

The Town proposed to initiate several new mitigation actions for the upcoming five years. Additionally, a number of actions from the previous planning period are being carried forward or replaced with revised actions. These are listed below.

Action SHM-01	
Reach out to the grocery store in the Town Center to offer assistance with the acquisition of an emergency generator for the business.	
Lead	DPW
Cost	\$0 - \$25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2022
Priority	High

Action SHM-02	
Educate property owners on the importance of maintaining trees on their properties, and especially along subdivision roads, through social media posts, posts on the Town website, mailers, and trainings or workshops.	
Lead	DPW
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2022
Priority	High

Action SHM-03	
Place copies of EAP documents in a location that is known to all relevant officials, and ensure those officials continue to be informed as to that location	
Lead	DPW
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action SHM-04	
Add to the Sherman OEM webpage links to State and Federal websites with information about personal preparedness, such as: portal.ct.gov/DPH/Communications/Emergency-Preparedness--Response/Home or www.ready.gov	
Lead	OEM
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action SHM-05	
Develop an emergency response plan for the Timber Trails area that addresses the risk of isolation.	
Lead	DPW
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action SHM-06	
Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to identify historic resources at risk and support the preparation of resiliency plans across the state.	
Lead	Planning
Cost	\$25,000 - \$50,000
Funding	CT SHPO
Timeframe	2024
Priority	High

Action SHM-07	
Reevaluate the drainage computations for public dead-end roads in town that span a watercourse, evaluating the dead-end roads with the most structures at risk first	
Lead	OEM
Cost	\$25,000 - \$50,000
Funding	Capital Improvement Plan, FEMA Grant
Timeframe	2024
Priority	Med

Action SHM-08	
Annually conduct an emergency operations exercise for a local terrorism, sabotage, or mass casualty event.	
Lead	EMD
Cost	\$25,000 - \$50,000
Funding	Operating Budget
Timeframe	2024
Priority	Low

Action SHM-09	
Install a transfer switch, and perform any other necessary improvements, to allow for tie-in of the Town Hall building to a portable generator.	
Lead	0
Cost	\$100,000 - \$500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2025
Priority	High

Action SHM-10	
Add additional supplies of firefighting water where adequate water supplies do not currently exist, including: Briggs Hill Road and Route 37 South between Briggs Hill Road and Wakeman Road	
Lead	OEM
Cost	\$100,000 - \$500,000
Funding	Capital Improvement Plan, Other Grant
Timeframe	2025
Priority	High

Action SHM-11	
Conduct engineering studies on Town culverts that are suspected of being undersized, with a target of two in the five-year lifespan of this plan	
Lead	OEM
Cost	\$50,000 - \$100,000
Funding	Operating Budget, Grant
Timeframe	2025
Priority	Low

Action SHM-12	
Purchase a backup generator and have it installed at the Old Town Hall/Senior Center	
Lead	OEM
Cost	\$100,000 - \$500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Med

Action SHM-13	
Purchase a backup generator and have it installed at either the Catholic Church or the Jewish Community Center	
Lead	DPW
Cost	\$100,000 - \$500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Med

Action SHM-14	
Upgrade Town culverts found to be undersized through engineering studies or reevaluated drainage computations. Focus on dead-end roads	
Lead	OEM
Cost	More than \$500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Med

Action SHM-15	
Acquire a portable generator that can be used to power the Town Hall building.	
Lead	DPW
Cost	\$100,000 - \$500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

Action SHM-16	
Identify, equip, and designate an additional shelter or comfort station within Sherman, south of the Town Center, so that residents who live in that area aren't cut off from municipal shelters and services if the main north-south roads are flooded or blocked. (Consider coordination with the Timber Trails Property Owners Association on use of the Lake Mauweehoo Club).	
Lead	0
Cost	\$100,000 - \$500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

APPENDIX A

Appendix A: STAPLEE Matrix

[illegible]

#	Action Description	Regional Theme	Lead Department	Cost Estimate	Potential Funding Sources	Timeframe for Completion	Weighted STAPLEE Criteria														Total STAPLEE Score	
							Benefits							Costs								
							Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental		
SHM-16	Acquire a portable generator that can be used to power the Town Hall building.	Energy Resiliency & Backup Power	DPW	\$100,000 - \$500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	1	0	1	1	0	0	0	-1	-1	0	0	0	0	4
SHM-17	Identify, equip, and designate an additional shelter or comfort station within Sherman, south of the Town Center, so that residents who live in that area aren't cut off from municipal shelters and services if the main north-south roads are flooded or blocked. (Consider coordination with the Timber Trails Property Owners Association on use of the Lake Mauweehoo Club).	Emergency Response		\$100,000 - \$500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	0	1	0	0	0	0	0	0	-1	0	0	0	0	3

APPENDIX B

Appendix B: SVI Summary

Town of Sherman
Climate Vulnerability Assessment
A Component of Sustainable CT Action 5.4

The Town of Sherman, for this Climate Vulnerability Assessment (CVA) is considered a rural inland town, resulting in various climate change vulnerabilities. Inland flooding, extreme heat, and winter storms may impact the community the most as many issues have been identified.

Hazards

Inland Flooding

With FEMA flood zones along a few streams in town, such as Morrissey Brook and Tollgate Brook, there is continuously concern for riverine flooding. Also, Candlewood lake is in the southeastern part of town and can also be a source of flooding. Several roads are at risk of isolation during a flood event, therefore emergency access and evacuations can be impeded. With precipitation expected to increase due to climate change, flooding events may occur more frequently. Overall, flooding has been an issue in several areas in the past and may continue to be an issue with future shifts in precipitation.

Winter Storms

Sherman is largely residential, with higher densities of development in the southern portion of town around Candlewood lake, and larger residential parcels in the norther part of Town. The Town is also comprised of numerous dead-end roads, which during winter storms, snow removal or access may be a concern. Also, anticipated shifts in winter precipitation may bring more freezing rain events, which can result in an increase of downed trees during a winter storm event. Downed trees can result in power outages, and lack of emergency access and egress.

Drought and Extreme Temperatures

A majority of the town relies on private wells for drinking water, with a small area in south Sherman receiving public water service. Therefore, impacts to water supply may be an issue to the town as temperatures rise in the near future, resulting in isolated issues with water scarcity. With increased temperatures, and high pumping levels, private wells may be impacted during times of drought.

In addition to private wells, many rural communities have high levels of agricultural activity, whether it be crop production or livestock, these operations are heavily water dependent for healthy growing and revenue generation.

When considering these impacts from climate change, the primary vulnerabilities for the town of Sherman include:

- Private well owners
- Emergency access
- Agricultural operations

Secondary Impacts

Economic Impacts

With areas vulnerable to isolation during flooding and winter storm events, the town faces an economic challenge of addressing the flooding concerns and increasing snow and debris removal capacity. There is also a potential economic impact to local businesses during flooding events, and heavy winter storms. Businesses may also incur expenses related to flood mitigation or clean-up efforts, or experience loss of income if there is no site access during a storm.

Winter storm snow removal or icing also presents financial responsibility to the town by way of roadway treatment. As precipitation events may increase during winter months, the town may seek to increase sand or salt stockpiles to account for increased icing events.

Private property owners who rely on private drinking water wells may also be impacted economically during droughts or periods of extreme heat. With increasing heat, typically comes increased water demand. This demand would be placed upon local aquifers, potentially resulting in the need for new well construction, or deepening of an existing well.

The many impacts of climate change can result in economic impacts to many citizens, business owners, and municipal budgets as the impacts can be felt on a town level, down to building level.

Social Impacts

To identify social impacts to the town, the Center for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) was used to identify any vulnerable populations within the town. This index was developed to supplement a community's natural hazard preparation actions. To evaluate social vulnerability, the CDC incorporates 15 factors (Fig. 1) into the overall calculation under the categories, or themes, of: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation. These themes and their ranking are based on census statistics. By evaluating these factors and determining a level of social vulnerability, a community can identify specific needs for before, during, and after an event. Such needs may include sheltering capacity, evacuation routes, or to decide how many emergency personnel may be required to respond after an event.

Each municipalities' census tracts were ranked for overall vulnerability, and theme vulnerability, in comparison to other Connecticut municipalities. This rank, 0 to 1, is based on the percentile rank among all tracts within the State of Connecticut. A value closer to 0 indicates a lower vulnerability, while a value closer to

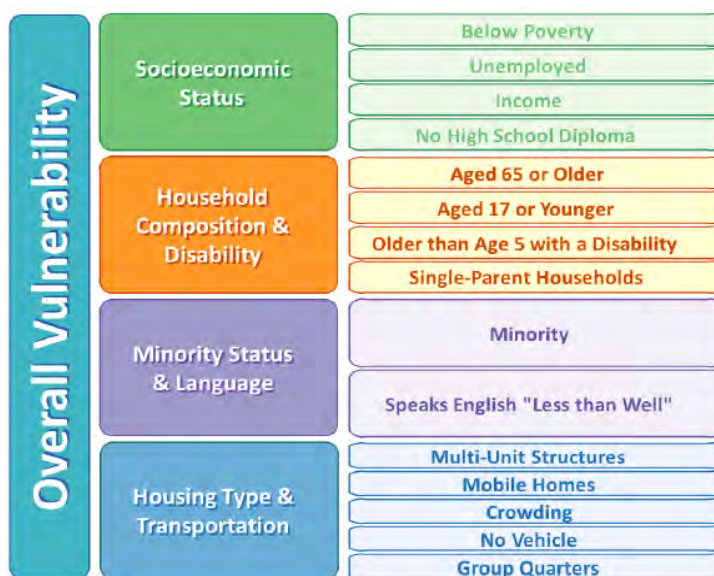


Figure 1: The CDC SVI Index Factors. Graphic: svi.cdc.com

1 indicates a higher vulnerability. Table 1 presents the overall vulnerability and theme rankings for Sherman.

Table 1: Sherman SVI Factor Rankings

	Overall SVI	Socioeconomic	Household Composition & Disability	Minority Status & Language	Housing Type & Transportation
SHERMAN	.01	.01	.18	.05	.07

The Town of Sherman is considered to have a low level of vulnerability, with their most vulnerable social aspect being the household composition and disability.

These populations may be vulnerable to impacts from drought, flooding and storm events based on the geographic concentrations.

Public Health Considerations

Of the primary vulnerabilities identified, drought and flooding can potentially have public health repercussions. During hot summer months, or drought, if private wells were to be impacted, certain populations may find themselves without adequate drinking water supply, resulting in health problems. Also, when considering the environmental shifts occurring during drought periods, drinking water contamination may become an issue as aquifers become stressed due to excessive pumping.

Food scarcity is another consideration when discussing the impacts of drought and extreme temperatures. Agricultural operations that are impacted by water shortages may find that crop or livestock yields are below average, ultimately resulting in food scarcity concerns. Depending on the size of an operation, the impacts can be on a small or large scale.

Flooding also presents the concern of pollution into nearby water bodies as these commercialized and impervious areas drain, they collect pollutants and excess sediment. Depending upon the drainage areas, this runoff can have environmental impacts in associated ecosystems, or public health impacts if water bodies are used for recreational activities.

Vulnerable Populations

The SVI identified the presence of certain populations within the town that may be more vulnerable to climate change hazards. With a higher level of household composition vulnerability, there is likely a large elderly and disable population throughout the town. While many may not feel the impacts of a natural hazard event, there are special considerations for assisting these populations during and after an event.

These populations often need additional time for hazard response, so evacuation or preparation, and may find it more challenging to recover due to financial constraints or health concerns. These populations should be considered more vulnerable for the reasons that emergency response and preparation may be more challenging, health issues may be of higher concern, and language barriers may exist when working to communicate with the community on risks, response, and recovery efforts.

In addition to the populations, it is important to identify the facilities that can provide different types of assistance to the populations, and others, during or after an event. These facilities, and their proximity to flood zones, can be found in Figure 2-4.