Western Connecticut Council of Governments
2020 Hazard Mitigation Plan Update

Municipal Annex
for
Ridgefield

400 Main Street
Ridgefield, CT
January 2021

Prepared for:
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MMI #3101-22

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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 Ridgefield 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

Founded in 1708, the Town of Ridgefield is located in central Fairfield County and is home to a population of 24,638 (2010 U.S. Census). Ridgefield is bordered by the municipalities of Danbury to the north, Redding to the east, Wilton to the south, and to the west Lewisboro and North Salem, New York. Refer to Figure 2-1 for a map showing the location of Ridgefield within the region.

Ridgefield is located in the southern foothills of the Berkshire Mountains. The topography of the town is characterized by ridgelines and hillsides that provide panoramic views, along with rolling terrain with high plateaus, steep slopes and river and stream valleys. The Norwalk River, Still River and Saugatuck River and numerous other small rivers and streams course through the town. The varying terrain of Ridgefield makes the town vulnerable to an array of natural hazards.

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 for Ridgefield can be found in Table 2-1.

Table 2-1: Land Cover by Area

Land Cover Class	Percent by Total Area
Developed	22.8%
Turf & Grass	12.5%
Other Grasses	1.0%
Agricultural Field	1.3%
Deciduous Forest	51.2%
Coniferous Forest	1.9%
Water	2.2%
Non-Forested Wetland	0.32%
Forested Wetland	6.4%
Tidal Wetland	0.0%
Barren Land	0.10%
Utility Corridor	0.13%

2.1.2 Land Use

Table 2-2 summarizes land use data, which was taken from the Town's 2020 Plan of Conservation and Development (POCD). According to this data, 20,901 acres or 93.5% of Ridgefield's total land area is currently occupied by residential development and 1,020 acres of the town is zoned for business.

Table 2-2: Ridgefield Land Use Summary

Land Use	Acres	% of Total Land Area
Residential		
Low Density Residential	*20,901*	*93.5%*
R-AAA – About 0.3 units per acre	5,887	
R-AA – About 0.5 units per acre	13,533	
R-A – About 1.0 units per acre	1,481	-
Higher Density Residential	*422*	*1.9%*
R-20 – about 2.0 units per acre	160	
R-10/R-7.5 – about 4.0+ units per acre	56	
MFDD/CAH/CCF/ARHD/MSDD/HOD	206	
Business	*1,020*	*4.6%*
CBD	42	
B-1 – Business	84	
B-2 – Business	260	
B-3 General Urban	27	
NB – Neighborhood Business	7	
CDD – Corporate Development	599	
Total	**22,342**	**100%**

Source: Plan of Conservation and Development, Town of Ridgefield, 2020

According to the town's 2010 Plan of Conservation and Development (POCD) "most land in Ridgefield (87%) has been developed or is committed to a land use. Almost 60% of developed/committed land is for residential use and roughly 30% is open space or institutional uses. Business use comprises the smallest percentage at three percent."

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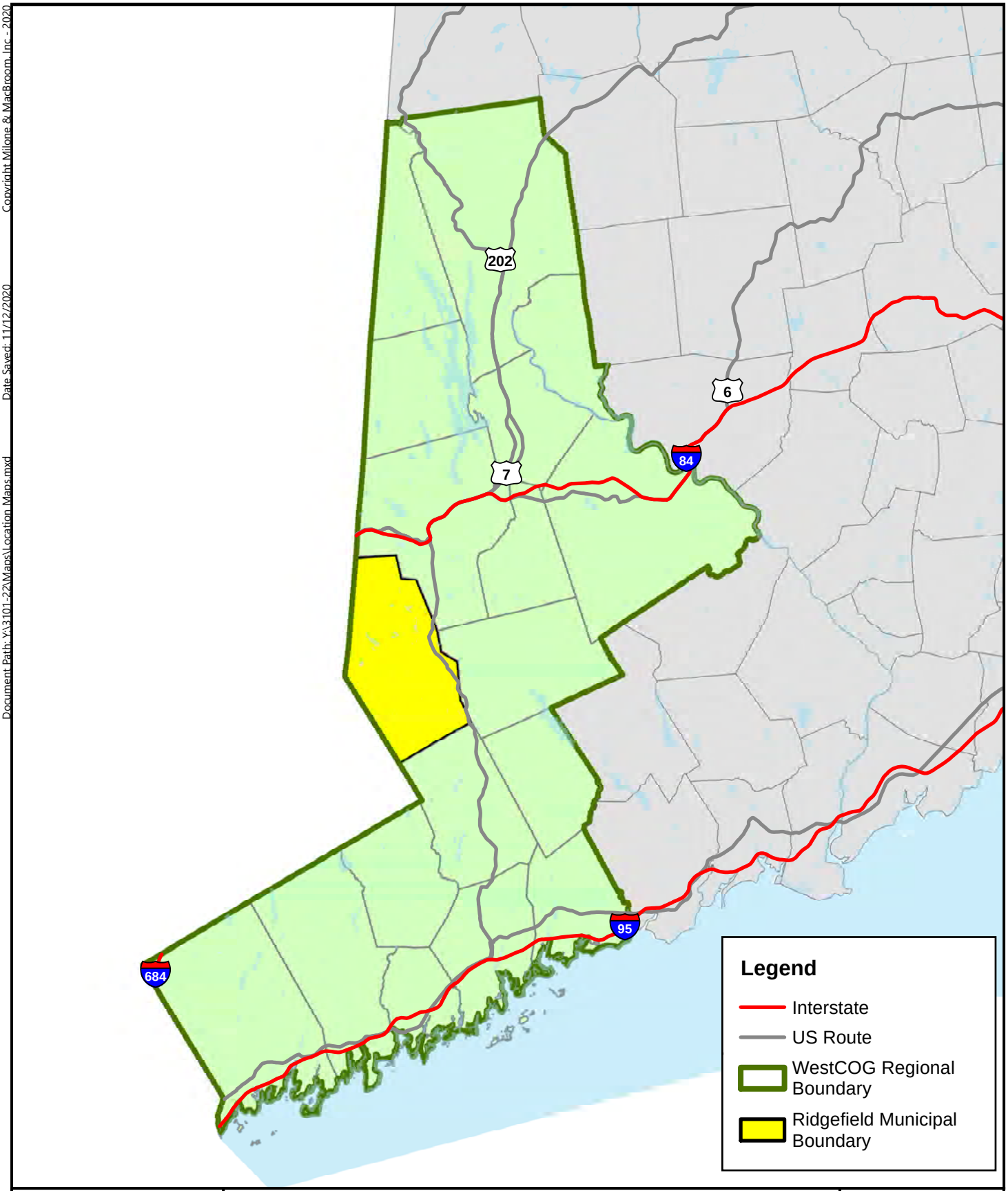

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Regional Location of Ridgefield

WestCOG Hazard Mitigation Plan
Town of Ridgefield

N

0 40,000 80,000
Feet

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FIG. 2-1

2.1.3 Climate and Climate Change

Current Conditions

Over the course of the year, the temperature in Ridgefield typically varies from 19°F to 81°F and is rarely below 4°F or above 88°F. The warm season lasts from May 31 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 64°F. The cold season lasts from December 2 to March 11, with an average daily high temperature below 44°F. The coldest day of the year is January 29, with an average low of 19°F and high of 35°F.

Precipitation falls throughout the year in Ridgefield. The wetter season lasts from April 9 to August 19, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 36% 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 3, with an average total accumulation of 3.9 inches. The least rain falls around January 30, with an average total accumulation of 1.6 inches.

The snowy period of the year lasts from November 3 to April 13, 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 26, with an average total liquid-equivalent accumulation of 1.1 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 CO_2 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% 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% annual-chance storm in Ridgefield as 3.43 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 50% annual-chance annual storm in Ridgefield at 3.60 inches.

These precipitation amounts, and more details, are summarized in Table 2-3, below.

Table 2-3: 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	3.43	6.43	9.10
NOAA Atlas 14	3.60	6.69	8.52

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 Ridgefield can expect the 24-hour rainfall amount for a 50% annual-chance storm to be around 3.7 to 3.9 inches or greater.

Impervious surfaces and infrastructure in town have increased over time as well, leading to increasing runoff and peak discharge values.

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

Ridgefield is divided among the following nine subregional drainage basins: Comstock Brook, Mill River, Miry Brook, Norwalk Rover, Saugatuck River, Silvermine River, Still River, Titicus River and Waccabuc River. The drainage basins are described in detail below.

The majority of the drainage basins have FEMA-defined Special Flood Hazard Areas (SFHAs) along the primary watercourses. Such areas consist of 1% annual chance storm floodplains without elevations, 1% annual chance storm floodplains with elevations, and 0.2% annual chance floodplains.

Miry Brook

Miry Brook originates at the outlet of a swamp south of Shadow Lake Road near the Ridgebury section in northern Ridgefield. The brook generally flows east through Ridgefield and is joined by three unnamed tributaries before entering Danbury near Pine Mountain Road.

Norwalk River

The Norwalk River originates in ponds located in Ridgefield. The river meanders in a southerly direction, flows into Great Pond and continues to run parallel to Route 7 through Branchville. The river eventually joins Silvermine River and flows into Long Island Sound.

Saugatuck River

The Saugatuck River originates in Danbury, near Wooster Mountain State Park. The drainage basin extends into the northeast portion of Ridgefield, as the river continues to flow in a southerly direction into neighboring Redding. The Saugatuck River collects input from several small tributaries as it flows toward the Connecticut shoreline and ultimately drains into Long Island Sound.

Silvermine River

The Silvermine River is an 8.4-mile tributary to the Norwalk River. In Ridgefield, the East Branch Silvermine River begins south of Whipstick Street and flows in a southerly direction, past Spectacle Swamp and into neighboring Wilton.

Still River

Flowing north to the Housatonic River, the Still River begins in Danbury with several tributaries draining into the main river channel. A very small portion of the drainage basin is located in the northwest corner of Ridgefield.

Titicus River

The Titicus River is an 8.5-mile river that commences in central Ridgefield. The river meanders through Ridgefield in a northern direction until it reaches Ledges Road. At this point the river runs in a westerly direction where it enters New York, just south of Wallace Road. The River continues to run along Route 166 until it reaches Titicus Reservoir, which is part of New York City's water supply system.

Waccabuc River

The Waccabuc River tributaries in central Ridgefield drain in a westerly direction to the Cross River Reservoir in New York. This river is part of the New York City public water supply.

Comstock Brook

The Comstock Brook drainage basin drains approximately 640 acres of southern Ridgefield. Comstock Brook is a tributary to the Norwalk River and commences in neighboring Wilton. The Brook flows in a southerly direction until it meets the Norwalk River and eventually flows to Long Island Sound.

Mill River

The Mill River drainage basin begins in Ridgefield, then flows south by southwest, draining about 1,250 acres of the Town, into the Mill Reservoir in adjacent Pound Ridge, New York.

2.2 Society, Culture, and Government

2.2.1 Population and Demographic Setting

According to the 2010 U.S. Census, Ridgefield had a population of 24,638, with 695 persons per square mile. According to the 2018 Censure American Community Survey (ACS) 5-year summary, the Ridgefield population was 25,070. The Connecticut State Data Center predicts that population growth in Ridgefield will decrease slightly over the next eleven years. The population in 2025 is projected to be 24,342.

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 Ridgefield. 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.

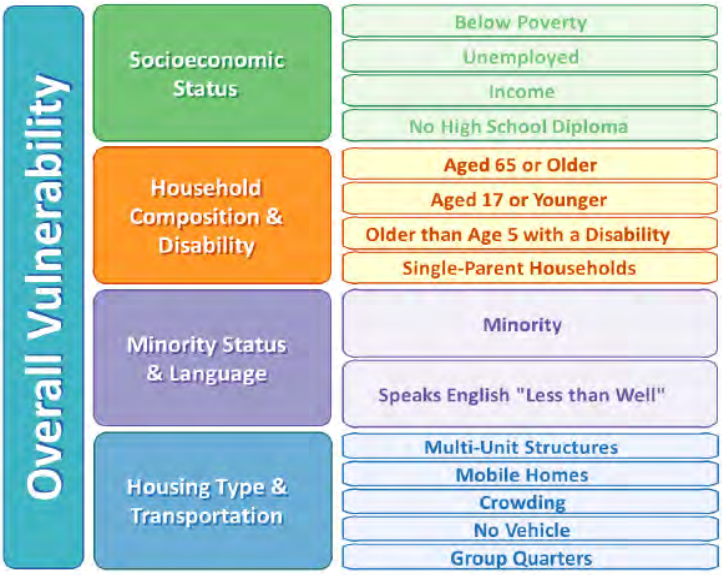

Figure 2-2: The CDC SVI Index Factors. Graphic: svi.cdc.com

The Town of Ridgefield is considered to have a low level of vulnerability, with their most vulnerable population being based on household composition and disability. These vulnerable populations for the town are primarily identified in the two most eastern tracts, with housing and transportation vulnerable populations also being more concentrated within these two tracts. Appendix B explores the SVI for Ridgefield in more depth, including maps showing overall vulnerability, and theme vulnerability.

2.2.2 Development Trends

The Ridgefield POCD emphasizes maintaining the vibrancy of Ridgefield Center and redeveloping the Branchville section of the town (around Branchville Station) which is immediately north of

Georgetown in neighboring Redding. The POCD recommends creating new zoning which would require a housing affordability component for any new residential development, and would be a "village district" to help maintain and enhance a distinct character for the village area as development occurs. The POCD recommends reviewing zoning of businesses districts including the Gateway area (Route 7 and Route 35) and calls for considering a zoning study of the Route 7 corridor to determine whether business or other non-residential uses might be appropriate while controlling the scale and size of developments, as well as expanding adaptive reuse of historic structures and residences in significant streetscapes along other major roadways.

The Schlumberger site in downtown Ridgefield is an area of significant redevelopment in Ridgefield. This site was formerly used as a research and development facility and will include residential and non-residential development.

The town does not have many pending housing developments at this time. A total of 304 units of housing called the "Eureka 5" development (former IBM property) were approved near the Danbury city line. Boehringer is often expanding. Other development in town includes commercial development just north of downtown.

Some small parcels have been acquired in recent years for open space, but no large acquisitions are planned as the town already has significant areas of open space.

Redevelopment in Branchville is potentially the most significant area of future development for the town. Much of the development in Branchville will be transit oriented development (TOD). This area includes flood risk zones and is subject to flooding from the Norwalk River. Route 7 has flooded in various sections of Ridgefield from Route 35 and southward into Wilton, including Branchville. Accordingly, the Town will need to carefully review and regulate development and redevelopment in Branchville. This will ensure that flood risks (and damage) will be minimized even if exposure to flooding may remain. Aside from the specific concerns in Branchville, vulnerabilities to natural hazards in Ridgefield is likely not increasing.

2.2.3 Governmental Structure

The Town of Ridgefield is governed by a Selectman-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 Planning and Zoning Commission, Conservation Commission, Inland Wetland and Water Course Agency, the Building Official, the Land Use Office, the Fire Department, Emergency Medical Services, and the Highway Department.

Drainage complaints are routed through the Public Works Department. These complaints are usually received via phone, fax, mail, or email and are recorded in a logbook. The complaints are investigated as necessary until remediation surrounding the individual complaint is concluded. If necessary, the complaints are incorporated into the Capital Improvement program.

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 Ridgefield are concentrated within the Ridgefield Center, Titicus Hill, and West Mountain Historic District. Resources also include the J. Alden Weir Farm, Frederick Remington House, Hickories Farm, Hugh Cain Fulling Mill and Elias Glover Woolen Mill Archaeological Sites, and the Railroad Station.
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 2-4.

Table 2-4: Number of Historic Assets Exposed to Different Hazards in Ridgefield

Hazard	Count
Dam Failure	0
Earthquake	450
Flooding	-
1% Annual	0
0.2% Annual	2
Storm Surge	-
Category 1	0
Category 2	0
Category 3	0
Category 4	0
Hurricane/Tropical Storm	450
Sea Level Rise	0
Thunderstorm	450
Tornado	450
Winter Storm	450
Wildfire	55

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.

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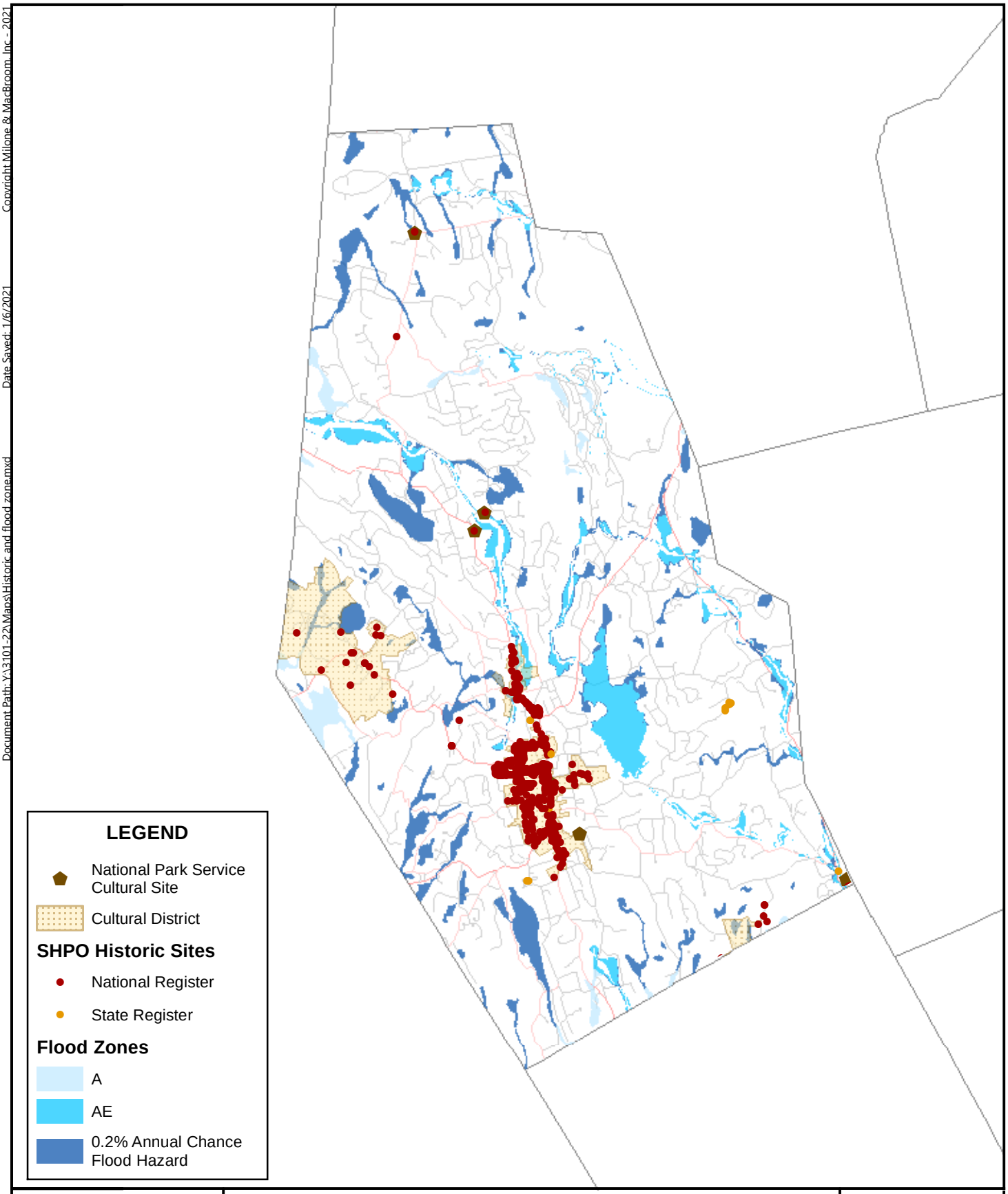

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Historic Resources with Flood Zones and Dam Failure Inundation Areas

WestCOG Hazard Mitigation Plan

Town of Ridgefield

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

SCALE 1 " = 7,128 '

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FIG. 2-3

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

Major transportation routes through Ridgefield include the north-south Route 7 in the western edge of Town, Route 116 connecting Ridgefield center to North Salem in the northwest, Route 102 connecting Ridgefield center to Branchville and Route 7 to the southeast, Route 33 running south from the town center, and Route 35 that runs east from South Salem to Ridgefield center before turning northeast.

Ridgefield is served by the Metro-North Railroad's New Haven commuter rail line through the Branchville Station.

2.3.2 Utilities

Aquarion Water Company provides drinking water to a large portion of Ridgefield, including: most of the area around Ridgefield Center; near the intersection of Route 7 and Route 35, and north along Bennetts Farm Road; in the Ridgefield Knoll neighborhood around Ridgefield Elementary School; and select other locations. Water is also provided to a handful of homes by the Brookview Water Company. Non-community Public Water Systems serve numerous properties throughout Town, while residents outside these areas rely on well water.

The Ridgefield Water Pollution Control Authority (WPCA) is responsible for the management and oversight of the Town's wastewater pumping stations, pipe infrastructure, and two Wastewater Treatment Facilities (WWTFs): the South Street WWTF serving Sewer District 1, and the Route 7 WWTF serving Sewer District 2. The WPCA is currently completing a Wastewater Facilities Plan to develop the needs and estimated costs for upgrades to the two WWTFs as well as the wastewater collection systems.

Electricity and natural gas are provided to Ridgefield by Eversource.

According to geoISP (geoISP.com), access to Broadband Internet is available to most residents in Ridgefield. There are 2 DSL Providers (AT&T and Connecticut Education Network), 2 Cable Internet providers (Xfinity and CSC Holdings), and 2 Fiber Internet providers (Fibertech Networks LLC and Level(3) Communications). There are also 4 Mobile Broadband (cellular) providers with service available in Ridgefield.

2.4 Planning and Regulatory Capabilities

2.4.1 Review of Existing Local Plans

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

- **Plan of Conservation and Development (POCD):** Ridgefield's most recent POCD was adopted in 2020. It addresses natural hazard concerns within the community, and includes strategies that will mitigate risks from those hazards as the community continues to develop.
- **Stormwater Management:** Ridgefield maintains a Stormwater Management Plan. This document has been updated to comply with the requirements of the US EPA 2017 updated *General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems* (MS4 General Permit). The Town adopted new Stormwater Management Regulations on September 4, 2020, which will help minimize the impacts of impervious surfaces on runoff.
- **Capital Improvement Plan (CIP):** Ridgefield 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:** Ridgefield 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):** Ridgefield's EOP is reviewed annually and updated as needed. Dam failure Emergency Action Plans (EAPs) for dams with failure inundation zones that may impact Ridgefield, and for which EAPs are available, are on file locally.
- **Watershed Management Plan:** Watershed Management Plans have been developed for the Saugatuck-Aspetuck, Still, and Norwalk River Watersheds. The Saugatuck River Watershed Based Plan was developed by the former South Western Regional Planning Agency (SWRPA) in 2012. The Still River Watershed Management Plan was developed by the Housatonic valley Association with support from the Still River Partners in 2019. The Norwalk River Watershed Action Plan was prepared by the Norwalk River Watershed Initiative Committee, HDR/HydroQual, and the former South Western Regional Planning Agency (SWRPA) in 1998 and updated in 2011. These plans are focused on water quality, but can help the community mitigate inland flood risks by incorporating watershed management best practices into its planning efforts.

2.4.1 Review of Regulatory Structures

Ridgefield 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:** Ridgefield enforces the Connecticut State Building Code locally.
- **Zoning Regulations:** Most recently updated in November 2018.
- **Inland Wetlands and Watercourses Regulations:** Most recently updated in May 2018.
- **Subdivision Regulations:** Most recently updated in December 2008. Include provisions promoting control of stormwater runoff, installation of firefighting water sources, construction of adequate emergency access and egress, and burial of utilities.
- **Stormwater Management Requirements:** The Town adopted a new set of Stormwater Management Requirements on September 4, 2020.

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 Ridgefield continues. The Town also considers various infrastructure and facilities (such as water and sewer pump stations) to be critical facilities, as well as companies and businesses storing hazardous materials. Table 2-5 identifies all of these critical facilities.

Table 2-5: Ridgefield Critical Facilities

Facility	Address or Location	Comment	Emergency Power	Shelter	In SFHA
Emergency Operations Center	Yanity Gymnasium 60 Prospect St	EOC; shelter for disaster workers	✓	✓	
Police Department	76 East Ridge Rd	Emergency Response	✓		
Fire Headquarters	6 Catoonah St	Emergency Response	✓		
Ridgebury Fire Station	169 Old Stagecoach Rd	Emergency Response	✓		*
Town Hall	400 Main St	Critical Records	✓		
Town Hall Annex	66 Prospect St	Health Dept. and Engineering Dept.			
Venus Municipal Building	100 East Ridge Road	Municipal Services			
Highway Garage	60 South St	Emergency Assistance	✓		
Ridgefield Recreation Center	195 Danbury Rd	Primary Shelter	✓	✓	
Barlow Mountain Elementary School	115 Barlow Mountain Rd	Secondary Shelter	**	✓	
East Ridge Middle School	10 East Ridge Rd	Tertiary Shelter	**	✓	
Scotts Ridge Middle School	750 North Salem Rd	MPOD Emergency Distribution Center	**		
Branchville Elementary School	40 Florida Rd	School; Emergency Water Supply	P		
Prospect Ridge Congregate Care	51 Prospect Ridge	Ridgefield Housing Authority owned Assisted and Senior Living			
Ballard Green	25 Gilbert St	Ridgefield Housing Authority owned 72-unit senior housing facility			
Laurel Ridge	642 Danbury Rd	Convalescent home and rehab center	✓		
Ridgefield Crossing	640 Danbury Rd	Assisted living and Alzheimer's care	✓		
Route 7 Wastewater Treatment Facility	901 Ethan Allen Hwy	Critical Facilities	✓		***
South St Wastewater Treatment Facility	Various Locations	Critical Facilities	✓		
Water Pumping Stations	Various Locations	Critical Facility, Aquarion Water Company			Some

Facility	Address or Location	Comment	Emergency Power	Shelter	In SFHA
Railroad Station	50 Ethan Allen Hwy	Critical Facility			✓
Major Roads	Various	Transportation arteries			Some
Boehringer Campus	900 Ridgebury Rd	Large employee base			

* Ridgebury Fire Station is adjacent to a Special Flood Hazard Area

** These generators are sufficient only for lighting and sustaining critical IT systems; they do not support full building use or sheltering

*** Access route to the Route 7 WWTF passes through Special Flood Hazard Areas

P The Branchville Elementary School has provisions for a portable generator hookup to operate as an emergency water supply

Town officials consider the commercial town center, in the vicinity of Main Street & Danbury Road, to be a critical area since the supermarket and Pharmacy are located there. These could provide essential services in an emergency. The two sewage treatment plants will eventually be consolidated into one facility at South Street. The railroad station is owned by the CT DOT and leased by the Town.

The Town Hall has installed a backup generator. Town staff report that the Town-owned Venus Building, which is used for municipal services, is in need of a generator. The Town would also like to install generators at additional schools, beyond those currently served by backup power. In particular, the Branchville School would benefit from a fixed-in-place generator given that the school is a non-transient non-community water system. At the present time, the Branchville School has provisions for a portable generator hookup to operate as an emergency water supply. The school should probably be added to the list of critical facilities.

Town officials are interested in evaluating the feasibility of developing a microgrid for the high school/middle school complex or for the area of the Town Hall, EOC, and Fire Department.

Emergency shelters are an important subset of critical facilities, as they are needed in many emergency situations. There are three identified shelters in the town that are also considered critical facilities. The Ridgefield Recreational Center on Danbury Road is the primary shelter for the town. The Barlow Mountain Elementary School on Barlow Mountain Road is considered the backup shelter. The East Ridge Middle School on East Ridge Road could be used as a third shelter if necessary. Each of these facilities have backup generators. Town officials noted during the April 29, 2014 public meeting that it would be beneficial to harden the utilities at the High School and install the necessary supplies and infrastructure to utilize part of the building as a shelter.

Laurel Ridge and Ridgefield Crossing, two residential care facilities, both have standby power, and are both also priority power restoration customers with Eversource.

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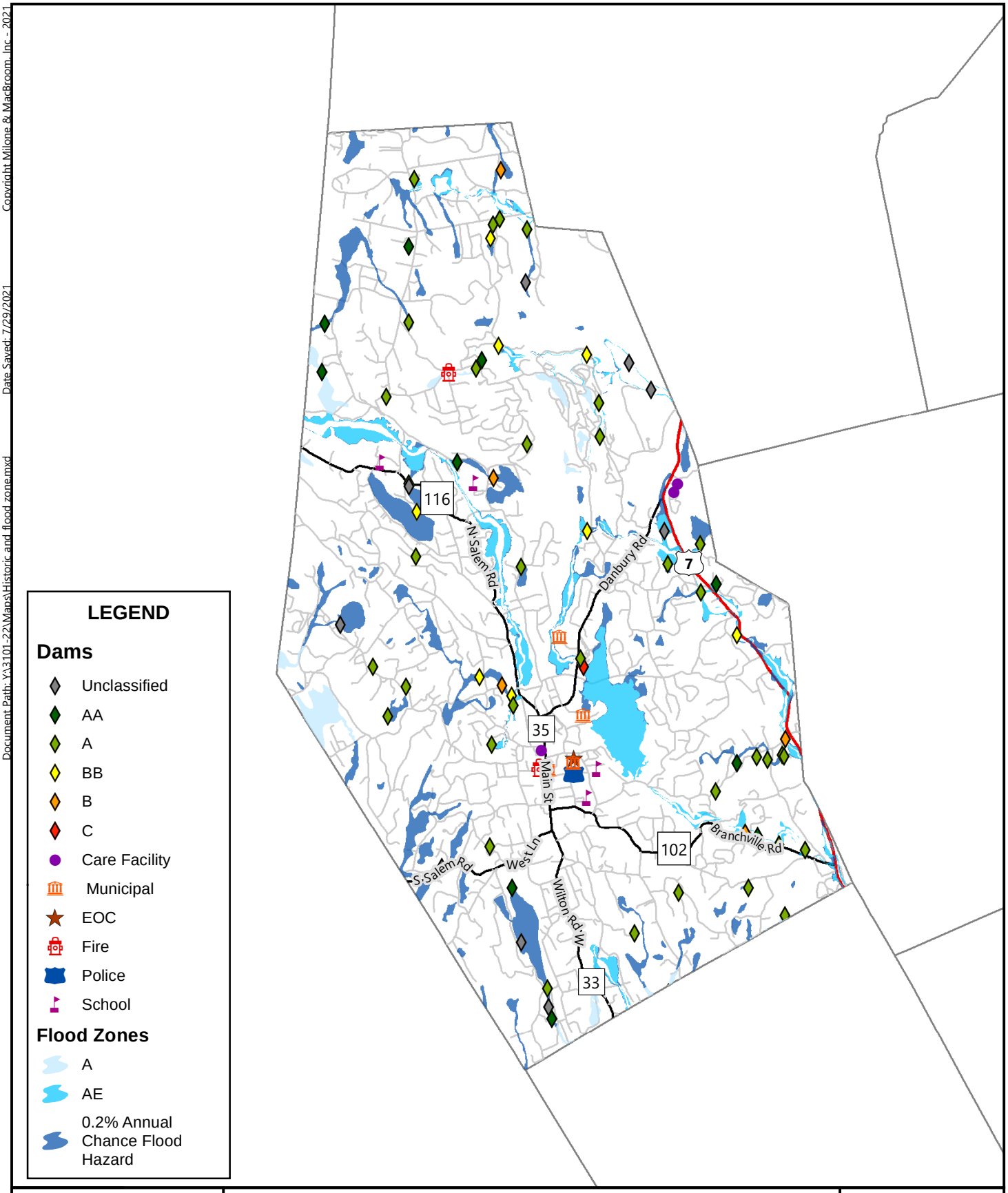

LEGEND

Dams

- Unclassified
- AA
- A
- BB
- B
- C
- Care Facility
- Municipal
- EOC
- Fire
- Police
- School

Flood Zones

- A
- AE
- 0.2% Annual Chance Flood Hazard

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Critical Facilities with Flood Zones and Dam Failure Inundation Areas

WestCOG Hazard Mitigation Plan

Town of Ridgefield

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

N

0 3,500 7,000
Feet

SCALE	1 " = 7,119 '
DATE	7/29/2021
PROJ. NO.	3101-22

FIG. 2-4

Emergency Response Capabilities

The Emergency Operations Team and the Police Department coordinate emergency preparedness in the Town of Ridgefield. The Town's Emergency Operations Center (EOC), including its Emergency Communications Center, is located the Yanity Gymnasium. The EOC's goal is to provide citizens with the highest level of emergency preparedness before, during, and after disasters or emergencies. That Town coordinates with all departments internally to develop plans, protocols, and procedures that assure the safety of Ridgefield's citizens. It also provides technical assistance to state and local emergency response agencies and public officials.

In Connecticut, the Department of Emergency Services and Public Protection (DESPP) operates, in part, using a regional approach. DESPP has divided Connecticut into five emergency planning regions and as such, DEMHS (Division of Emergency Management and Homeland Security) has been partnering with the former HVCEO and other regional planning organizations to strengthen emergency response. Ridgefield is located in Region 5, consisting of 43 towns in western Connecticut.

Town officials note that the Spruce Mountain Danbury/Ridgefield/DEMHS radio facility has been repaired and upgraded as needed.

The Town's EOP guides its response to emergencies arising from both natural and anthropogenic hazards. The Town utilizes the statewide emergency notification system known as "CT Alert" to direct geographically specific emergency notification telephone calls into affected areas. The local radio station, WLAD is also utilized for notification purposes.

The Town's Public Works Department performs tree and shrub removal and trimming on Town-owned lands and rights-of-way. During emergencies and following storms, the Public Works Department, in conjunction with the Parks Department, responds to calls related to downed trees and coordinates directly with Eversource Energy.

Public transportation is also available to move residents into and out of the town. HARTransit operates regular bus service in the town that may be available for use to move people and supplies. In addition, Town school buses and vans may be available for transportation during emergency situations.

3.0 HAZARD ASSESSMENT

3.1 FLOODING (COASTAL, INLAND, AND ICE JAMS)

3.1.1 Setting

The Town of Ridgefield has experienced various degrees of flooding in every season of the year throughout its recorded history. Melting snow combined with early spring rains has 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.

In general, minor flooding problems are widespread throughout Ridgefield. Extreme events along defined floodplains often result in damage to insured structures. The most common damage is to infrastructure and occurs due to flash flooding. The primary areas of flood concern in Ridgefield are along the Norwalk River. Areas of lesser flood risk are located along the Titicus River and Ridgefield Brook. Flooding also occurs throughout Ridgefield due in inadequate drainage systems.

3.1.2 Capabilities

The Town has consistently participated in the NFIP since September 30, 1982 and intends to continue participation in the NFIP. SFHAs in Ridgefield are delineated on a Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS). The FIRM delineates areas within Ridgefield that are vulnerable to flooding and was most recently published on June 18, 2010 as part of the Fairfield County FIS.

Ordinances, Regulations, and Plans

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

- ***Zoning Regulations (Floodplain Management Regulations)***. Effective May 1, 2007 and amended in 2013, Chapter 11 of the Zoning Regulations is essentially the local articulation of the NFIP regulations. The regulations have been enacted to "regulate floodplain development in Special Flood Hazard Areas (SFHA's), to protect the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to: Protect human life and health, and prevent damage to property; Minimize expenditure of public funds for costly flood control projects; Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; Minimize prolonged business interruptions and other economic disruptions; Minimize damage to public facilities, infrastructure and utilities, such as water and gas mains, electric, telephone and sewer lines, and streets and bridges, located in the floodplain; Help maintain a stable tax base by providing for the sound use and development of flood hazard areas in such a manner as to minimize flood damage, and future flood blight areas; Insure that potential buyers are notified that property is in a flood hazard area; Prevent increases in flood heights that could increase flood damage and result in

conflicts between property owners; Ensure that those who occupy the flood hazard areas assume responsibility for their actions; and discourage development in a floodplain if there is any practicable alternative to locate the activity, use, or structure outside of the floodplain.

- Section 11.5(a) outlines the general standards for all new construction and substantial improvements in Special Flood Hazard Areas.
- Section 11.5(b) outlines the standards for watercourses without established base flood elevations, adopted floodways and/or flood mapping.
- Section 11.5(c) provides specific construction standards for Special Flood Hazard Areas.
- Section 11.5(c)(1) states that all new residential construction, substantial improvements, and repair to structures that have sustained substantial damage which are residential structures shall have the bottom of the lowest floor, including basement, elevated to or above the base flood elevation (BFE).
- Section 11.5(c)(2) states that All new non-residential construction, substantial improvements, and repair to structures that have sustained substantial damage which are commercial, industrial or non-residential structures shall: have the bottom of the lowest floor, including basement, elevated to the same or above the base flood elevation (BFE); or In lieu of being elevated, non-residential structures may be dry flood-proofed to one foot above the BFE, provided that together with all attendant utilities and sanitary facilities, the areas of the structure below the required elevation are watertight with walls substantially impermeable to the passage of water, and provided that such structures are composed of structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.
- Section 11.5(c)(5) outlines requirements within floodways and states that No encroachments, including fill, new construction, substantial improvements, repairs to substantially damaged structures and other developments shall be permitted unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating, through hydrologic and hydraulic analyses performed in accordance with standard engineering practice, that encroachments shall not result in any increase in flood levels during occurrence of the base flood discharge.
- Section 11.6 provides design standards for subdivision proposals.

- ***Wetlands and Watercourse Regulations*** (Amended 2011). The Ridgefield Planning and Zoning Commission was designated the Inland Wetlands Board of the Town of Ridgefield and was authorized to promulgate, to enact and to administer these regulations in accordance with the decision of the special town meeting held on June 5, 1974. The purpose of the regulations is to protect the quality of the inland wetlands and watercourses within the Town of Ridgefield by making provisions for the protection, preservation, maintenance, and use of inland wetlands and watercourses, including deterring and inhibiting the danger of flood and pollution.
  - Section 2.2 – Regulated Activity means any operation within or use of a wetland or watercourse involving grubbing, removal or deposition of material, or any obstruction, construction, alteration or pollution, of the wetlands or watercourses, but shall not include the activities specified in subsection 4.1 and 4.2 of these regulations. Furthermore, the activities listed in Section 4.5, when occurring or proposed to occur

within the distances from wetlands and watercourses specified in that section, are regulated activities.
  - Section 4.1(b) indicates that no residential homes shall be permitted "as of right" in wetlands and watercourses after July 1, 1987.
  - Section 6.1 states that no person shall conduct or maintain a regulated activity without first obtaining a permit for such activity from the Inland Wetland Board of the Town of Ridgefield
  - Section 7 outlines permit application requirements.

- ***Subdivision of Land Regulations.*** Effective June 17, 1983, the Town's Subdivision Regulations establish minimum acceptable standards with respect to the subdivision of land including provisions for protective flood control, open spaces for parks and playground and conservation, the laying out and improvement of streets and public and private utilities services.
  - Specifically, the regulations state that "no plan for the subdivision of land will be approved unless: (a) the land to be subdivided is of such character that it can be used for building purposes without danger to health or the public safety; (b) proper provision is made for water, drainage and sewerage and, in area contiguous to brooks, rivers or other bodies of water subject to flooding, for protective flood control measures; (c) the proposed streets are in harmony with existing or proposed principal thoroughfares shown in the development plan of the town as now or hereafter amended especially with regard to safe intersections with such thoroughfares, and so arranged an of such width as to provide an adequate and convenient system for present and prospective traffic needs; and (d) open spaces as described in Article IV are provided where deemed proper by the Commission, which open spaces shall be shown on the subdivision plan."
  - Section 4-35 outlines the following provisions for flood hazard reduction and states that all subdivision of land containing land area of special flood hazard shall: (1) be required to be consistent with the need to minimize flooding. (2) Have adequate drainage provided to reduce exposure to flood damage. (3) have public or private utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage. (4) show contour line(s) identifying and locating base flood elevation data as required by section 325.0 of the zoning regulations; and (5) Show and describe the extent to which any watercourse will be altered or relocated.

- ***Plan of Conservation and Development.*** This 2010 document is the Town's vision statement for future development. It is updated every 10 years. With respect to flooding, the POCD notes that land use in floodplains should be strictly controlled in order to minimize potential flood hazards on-site and downstream, to maximize water storage and ground water recharge and to protect wildlife and habitat. The POCD also notes the need to address total runoff in an effort to reduce water pollution. The objectives under the goal "Minimize Flooding" are to "Continue to regulate activities in flood plains" and "Increase on-site stormwater infiltration and retention."

Low impact Development is an approach to land development (or redevelopment) that works with nature to manage storm-water as close to its source as possible.

Floodplain Management, NFIP and CRS

The NFIP administrator for the Town oversees the enforcement of NFIP regulations. The degree of flood protection established by the variety of regulations in the Town meets the minimum reasonable for regulatory purposes under the NFIP. The Town is not enrolled in the Community Rating System (CRS) program.

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.

Structural Projects and Drainage

The Town Department of Public Works is in charge of 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 Public Works Department. The Town uses these reports to identify potential problems and plan for maintenance and upgrades.

Communications

The Town receives regular weather updates through Division of Emergency Management and Homeland Security (DEMHS) Region 5 email alerts as well as watches and warnings through the National Weather Service.

The Town can access the National Weather Service website at http://www.weather.gov/ to obtain the latest flood watches and warnings before and during precipitation events.

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.

Actions Completed and New Capabilities

The need for drainage studies was discussed in the previous hazard mitigation plan. The Town has made some progress in this area. For example, A consultant (Tighe & Bond) was finishing one phase of a drainage study and was expected to be continuing with phase two around the time this plan was being developed.

Summary

In summary, the Town primarily attempts to mitigate future flood damage and flood hazards by restricting building activities in floodprone areas. This process is carried out through 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. These regulations rely primarily on the FEMA-defined 1% annual chance flood elevations to determine flood areas.

The Town is proceeding with drainage studies in numerous flood concern areas.

3.1.3 Vulnerabilities and Risk Assessment

Drainage and flooding continue to be the primary natural hazard concerns in Ridgefield, despite progress made in completing drainage studies. The Town is also concerned about possible new flood risks associated with the potential decommissioning of Fox Hill Dam. CT DEEP and NRCS have been evaluating the dam, which was built for flood control. If the dam is removed, numerous properties may have new flood risks.

Vulnerability Analysis of Repetitive Loss Properties

Based on correspondence with the State of Connecticut NFIP Coordinator at the Connecticut DEEP, six repetitive loss properties (RLPs) are located in the Town of Ridgefield. Of this total, four of the properties are residential, and two are commercial.

Table 3-1: Repetitive Loss Properties

Type	Flooding Source	Mapped Floodplain
Residential	Bennett's Farm Brook	1% Annual Chance
Residential	Ridgefield Brook	None
Residential	Unknown	None
Residential	Ridgefield Brook	None
Commercial	Norwalk River	1% Annual Chance
Commercial	Norwalk River	0.2% Annual Chance

Two of the repetitive loss properties are located in Branchville and are associated with the Norwalk River. Three others are near smaller watercourses, but the source of flooding at the remaining property is not understood.

Vulnerability Analysis of Critical Facilities

The list of critical facilities provided by the Town (Section 2.9) was used with the parcel data to accurately locate each critical facility throughout the town. One of the critical facilities, the Metro-North Railroad, was found to lie within the 1% annual chance floodplain. In addition, the Ridgebury Fire House was found to be immediately adjacent to the 1% annual chance floodplain. While these facilities are not known to have experienced serious flooding damage in recent years, their proximity to the Norwalk River and Bennett's Farm Brook, respectively, makes them susceptible to flooding. While these facilities are at risk to the 1% annual chance flood, they may also be prone to flooding of a lesser magnitude.

Vulnerability Analysis of Areas Along Watercourses

The primary waterways in the town are the Norwalk River and the Titicus River. The remaining waterways in Ridgefield are mostly smaller streams and brooks. A regulatory floodplain with AE designation has been mapped along the Titicus River, the Norwalk River and the Ridgefield Brook. Floodplains without (Zone A) elevations are delineated for the majority of the remaining brooks in the town. Specific areas susceptible to flooding are identifiable by the FEMA defined special flood hazard areas. Refer to Figure 2-4 for the areas of Ridgefield susceptible to flooding based on FEMA flood zones.

Ridgefield Brook

Town officials indicated that two small drainage basins reportedly merge on the Casagmo Condominiums property and the condominiums are flooded. Although damage has not yet occurred, town officials believe that it will happen one day as impervious surfaces continue to increase in the watershed upstream of the condominiums. This area is a tributary to Ridgefield Brook and thus a tributary to the Norwalk River. Town officials will need to ensure that new projects in the condominium complex do not increase flooding.

The town also believes that a downtown drainage study is needed. This study could include the Casagmo Condominiums and other downtown properties. The results of the study could be used to demonstrate to the land use commissions when the tipping point for flood damage could occur. Funding for this study could be sought through the Small Town Economic Assistance Program (STEAP).

Norwalk River

Redevelopment in Branchville has been an area of major redevelopment for the town. This area includes flood risk zones and is subject to flooding from the Norwalk River. Route 7 has flooded in various sections from Route 35 into Wilton, including Branchville. Precision Brake on Route 7 (32 Ethan Allen Highway) is repeatedly flooded by the Norwalk River.

Town officials also believe that replacement of North Bridge and the Florida Hill Road Bridge at the Norwalk River are potential mitigation projects that could alleviate flooding.

Titicus River

The Titicus River corridor is also floodprone. An Army Corps project to conduct selected clearing in the river has long been delayed according to some town representatives. Private properties have been flooded along the river, with some damage over the years. The town has hired contractors over the years to clear out sections of the river to improve conveyance and reduce flood risk.

A house on Wooster Street near the Titicus River would be a good candidate for elevation and the town could serve as the applicant for FEMA mitigation funds.

Miry Brook

George Washington Highway in the northern section of town experiences flooding from Miry Brook and its tributaries.

Vulnerability of Other Areas

Other areas around the town suffer from street flooding due to undersized or nonexistent drainage systems. Specifically, the town has identified the following areas of concern:

- Flooding occurs at Route 116 and Barlow Mountain Road when a storm drainage system becomes clogged. Up to three feet of water has flooded the road in the past.
- Numerous culverts under Bennett's Farms Road may be undersized and are planned for replacement in the future.

- Flooding has also been known to occur at Wilton Road East, Rowland Lane, Oreneca Road, Rippowam Road, Wooster Street, Spring Valley Road, Ledges Road, New Street at Route 7, Portland Avenue, and South Street.
- Beavers cause flooding on Reagan Road.

Changes and Improvements

The town has made progress with conducting drainage studies, and has also updated their floodplain regulations to reflect the most recent DEEP recommendations.

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.

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

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's Planning and Zoning Commission is responsible for reviewing all development activities that occur within flood hazard or flood-prone areas.

Actions Completed and New Capabilities

Ridgefield continues to maintain its strong dam failure mitigation capabilities.

3.2.3 Vulnerabilities and Risk Assessment

As of 2013, there were 73 DEEP-inventoried dams within the Town of Ridgefield. These dams are shown in Figure 2-4. Six of these dams are considered high hazard (Class B or C). As shown in Table 3-2, one of the high hazard dams is owned by the Town of Ridgefield, three by private residents, one by a homeowners association and one by the CT DEEP. Failure of these structures may have an impact on Ridgefield.

Table 3-2: High Hazard Dams with Potential to Affect the Town of Ridgefield

Number	Name	Location	Class	Owner
11801	Millers Pond Dam	Norwalk River, Ridgefield	B	Dana Matthow
11809	Roberts Pond Dam	Titicus River, Ridgefield	B	Joseph M. & Barbara G. Lane
11814	Johns Pond Dam	Cooper Pond Brook, Ridgefield	B	Kenneth Smith
11823	Shadow Lake Dam	Trib. to Miry Brook, Ridgefield	B	Town of Ridgefield
11856	Lake Naraneka Dam	Titicus River, Ridgefield	B	Twixt Hills Homeowners Assoc. Inc.
11858	Great Swamp Flood Control Dam	Ridgefield Brook, Ridgefield	C	Connecticut DEEP

Millers Pond (Dam No. 11801) – Norwalk River, Ridgefield

The Millers Pond Dam is a Class B dam located at the southern end of Millers Pond and impounds a reservoir from a contributing watershed of 7.04 square miles. The earthen dam is 13 feet in height and 152 feet in length. It is privately owned and used to impound a reservoir for aesthetic purposes. The dam discharges to the Norwalk River, crossing under Florida Hill Road before

flowing alongside State Route 7 into Redding. Three houses are located directly downstream of the dam and would be affected by floodwaters.

Roberts Pond Dam (Dam No. 11809) – Titicus River, Ridgefield

The Roberts Pond Dam is a privately owned Class B dam located at the southern end of Roberts Pond and impounds a reservoir from a contributing watershed of 1.0 square miles. The earthen dam is 120 feet in length. The dam discharges to the Titicus River and flows northward towards North Salem, New York. Houses on Saw Mill Hill Road and the downstream Freemans Pond Dam would be affected by floodwaters.

Johns Pond Dam (Dam No. 11814) – Cooper Pond Brook, Ridgefield

The Johns Pond Dam is a Class B dam located at the southeast end of Johns Pond and impounds a storage volume of 10.67 acre-feet from a contributing watershed of 0.91 square miles. The earthen dam is 8 feet in height and 150 feet in length. It is privately owned and used to impound a reservoir for recreation. The dam discharges to Cooper Pond Brook and flows southeast parallel to Route 102 through two additional Class A dams and on to its confluence with the Norwalk River. Floodwaters have the potential to affect a number of residences, including one house on Stony Hill Road, and four houses with driveways off Branchville Road that are located adjacent to the downstream watercourse.

Shadow Lake (Dam No. 11823) – Ridgefield (unnamed tributary to Miry Brook)

The Shadow Lake Dam is a Class B dam located at the western end of Shadow Lake and impounds a storage volume of 101 acre-feet from a contributing watershed of 0.42 square miles. It is owned by the Town of Ridgefield and used to impound a reservoir for recreation. The earthen dam was constructed in 1937 and is 18 feet in height and 1,000 feet in length. The reservoir discharges to an unnamed watercourse that flows southward to Miry Brook, crossing Beaver Brook Road before the confluence. Miry Brook flows to the southeast under the George Washington Highway before continuing into Redding. Floodwaters may affect residences on Beaver Brook Road, Chipmunk Lane, and the George Washington Highway.

Lake Naraneka (Pierrepont Lake Dam) (Dam No. 11856) – Titicus River, Ridgefield

The Lake Naraneka Dam is a Class B dam located at the northwest end of Pierrepont Lake and impounds a storage volume of 677 acre-feet from a contributing watershed of 0.46 square miles. It is owned by the Twixt Hills Homeowners Associations, Inc. and used to impound a reservoir for recreation.

The concrete gravity dam was constructed in 1937 and is 18 feet in height and 156 feet in length. The reservoir discharges to Shadow Brook that flows northward to Titicus River, crossing under Barlow Mountain Road and Kiahs Brook Lane before the confluence. An unclassified dam known as Kiahs Brook Pond Dam is located on the upstream side of Kiahs Brook Lane, and would most likely be affected by an upstream dam breach.

An EOP for the Lake Naraneka Dan was originally prepared in May 1996 and updated in September 2006. The EOP includes the results of a dam breach analysis completed for the structure. The dam breach analysis predicts that four residences and two roadways would be

affected by dam failure. The roadways potentially affected by a flood wave include Barlow Mountain Road and Kiahs Brook Lane/Ledges Road and the four residences on Ledges Road. In the event of a failure, the EOP specifies that the owner will contact the Ridgefield Police Department and the CT DEEP, and that the police department is then responsible for notification of the potentially affected parties.

Great Swamp Flood Control Dam (Dam No. 11858) – Ridgefield Brook, Ridgefield

The Great Swamp Flood Control Dam is a Class C dam located on Ridgefield Brook approximately 450 feet upstream of its crossing of Danbury Road (Route 35). It is owned by the Connecticut DEEP and used to impound a reservoir for flood control. The dam impounds a storage volume of 1,202 acre-feet from a contributing watershed of 2.59 square miles. The dam was constructed in 1979 and is 10 feet in height and 450 feet in length. The Great Swamp extends from the dam and Farmingville Road southward to Ivy Hill Road. Ridgefield Brook flows northward to its confluence with the Norwalk River.

Outflow from the Great Swamp Dam flows under Fox Hill Drive and Danbury Road within 500 feet downstream of the dam. A number of residences along Fox Hill Drive may be affected by flood waters.

Other Dams

Town officials reported that the Mamanasco Lake Dam (Class BB) may be leaking and is in need of repair. The town has been unable to compel the property owner to evaluate the dam.

Changes and Improvements

The town has developed maintenance plans for Mamanasco and Shadow Lake Dams which are both town-owned.

3.3 HURRICANES AND TROPICAL STORMS

3.3.1 Setting

Several types of hazards may be associated with tropical storms and hurricanes including heavy or tornado winds, heavy rains, and flooding. While only some of the areas of Ridgefield are susceptible to flooding damage caused by hurricanes, wind damage can occur anywhere in the town. A hurricane striking Ridgefield is considered a possible event each year and could cause critical damage to the town and its infrastructure.

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.

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.

3.3.2 Capabilities

Existing mitigation measures appropriate for flooding were 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 dam and local flood protection projects.

Wind loading requirements are addressed through the state building code. The 2018 Connecticut State Building Code was amended in 2009 and adopted with an effective date of October 1, 2018. The code specifies the design wind speed for construction in all the Connecticut municipalities. Effective 2018, the design wind speed for Ridgefield is 110 miles per hour for a Category 1, 120 miles per hour for a Category 2 and 125 for Category 3 or greater. Ridgefield has adopted the Connecticut Building Code as its building code. The town website provides links to the State Building Inspector so that developers are able to find additional resources including wind standards.

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. The American Society of Civil Engineers recommends that new buildings be designed to withstand this peak three-second gust.

The Ridgefield Tree Warden is responsible for all tree work on town roads (within Town right-of-way only). Eversource, the local electric utility, provides tree maintenance near its power lines.

During Tropical Storm Irene, the Town used the CT Alert system to notify all residents in the SFHA that they may evacuate and use one of the shelters. The Board of Education used its notification system to notify people on its list of emergency procedures. 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.

As the Town of Ridgefield 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 determines sheltering need based upon areas damaged or needing to be evacuated within the town. 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.

Actions Completed and New Capabilities

The Town has strengthened its tree management capabilities in recent years. The Town is active with tree trimming and works with Eversource to reduce risks of power loss due to downed lines. The Town's tree warden has a budget of $400,000 per year and has access to additional funds when needed; it to spend $500,000 in 2020 for tree and tree limb maintenance.

3.3.3 Vulnerabilities and Risk Assessment

The Town of Ridgefield is vulnerable to hurricane damage from wind and flooding and from any tornadoes accompanying the storm. In fact, the roof of the EOC/Yanity Gymnasium was damaged during Hurricane Sandy. This facility also has windows on the second floor that must be boarded up before wind events and cannot be used to its full capacity as a regional shelter during these situations.

Some critical facilities are more susceptible than others to flooding damage associated with hurricane rainfall. Such facilities susceptible to flooding were discussed in Section 3.1.3.

Ridgefield's housing stock consists of historic buildings greater than 50 and sometimes greater 100 years old, relatively younger buildings built before 1990 when the building code changed to address 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. Homes located within SFHAs are also at risk from flooding as a result of the heavy rainfall that typically occurs during tropical storms and hurricanes.

Changes and Improvements

Municipal facility roofs have been evaluated and are up to wind standards.

3.4 SUMMER STORMS AND TORNADOES

3.4.1 Setting

Summer storms and tornadoes have the potential to affect any area within Ridgefield. 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.

Based on the historic record, it is considered highly likely that a summer storm that includes lightning will impact the Town of Ridgefield 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 Fairfield 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.

Several methods of mitigation for wind damage are employed in Ridgefield as explained in Section 3.3.2. In addition, the Connecticut State Building Code includes guidelines for the proper grounding of buildings and electrical boxes. Eversource trims trees along powers lines. The town tree warden can remove dead and diseased trees in rights-of-way or Town land, working through the Public Works Department. Town-owned equipment is used except for complex situations, which would call for the use of a contractor. Most downed power lines in Ridgefield are detected quickly, and any associated fires are quickly extinguished.

Municipal responsibilities relative to summer storm and tornado mitigation and preparedness include:

- Developing and disseminating emergency public information and instructions concerning tornado, thunderstorm wind, lightning, and hail safety, especially guidance regarding in-home protection and evacuation procedures and locations of public shelters
- Designating appropriate shelter space in the community that could potentially withstand lightning and tornado impact
- Periodically testing and exercising tornado response plans
- Putting emergency personnel on standby at tornado "watch" stage

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 predisaster 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.

Actions Completed and New Capabilities

The town maintain capabilities for mitigating and responding to the impacts of summer storms and tornadoes.

3.4.3 Vulnerabilities and Risk Assessment

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. Thunderstorms are expected to impact Ridgefield 20 to 30 days each year. The majority of these events do not cause any measurable damage. Although lightning is usually associated with thunderstorms, it can occur on almost any day. The likelihood of lightning strikes in the Ridgefield 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 Ridgefield is considered moderate in any given year.

According to the 2014 *Natural Hazard Mitigation Plan Update*, Fairfield County has a moderate to high risk of tornado activity based on historical occurrences. Therefore, by virtue of its location in Fairfield County the Town of Ridgefield has a moderate to high potential to experience tornado damage.

Most thunderstorm damage is caused by straight-line winds exceeding 100 mph. Straight-line winds occur as the first gust of a thunderstorm or from a downburst from a thunderstorm and have no associated rotation. The risk of downbursts occurring during such storms and damaging the Town of Ridgefield is believed to be low for any given year. All areas of the town are susceptible to damage from high winds although more building damage is expected in the town center while more tree damage is expected in the less densely populated areas.

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. Strong thunderstorms are likely to cause power lines to fall all over the town.

Changes and Improvements

The town encourages residents to purchase NOAA weather radios with alarm features to stay informed during events.

Summary

The entire Town of Ridgefield is at relatively equal risk for experiencing damage from summer storms and tornadoes. Based on the historic record, very few summer storms or tornadoes have resulted in costly damages to the town. Most damages are relatively site specific and occur to private property (and therefore are paid for by private insurance). For municipal property, the Town budget for tree removal and minor repairs is generally adequate to handle summer storm damage.

3.5 WINTER STORMS AND NOR'EASTERS

3.5.1 Setting

Winter storms and the hazards that result (wind, snow, and ice) have the potential to affect any area of Ridgefield. Due to its variable elevation, the Town can have higher amounts of snow in the outskirts of the town than in the town center. In general, winter storms are considered highly likely to occur each year (although major storms are less frequent), and the hazards that result typically have a widespread geographic extent.

Most winter weather events occur between December and March.

According to the 2019 Connecticut State Natural Hazard Mitigation Plan the state can expect to experience at least two or more major snow events each year, with an average of 14 winter events in a season. It is estimated that Ridgefield's average annual snowfall is about 2.5 to 4 feet.

According to the 2019 Connecticut Natural Hazard Mitigation Plan Update, recent climate change studies predict a shorter winter season for Connecticut (by 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 or ice rather than snow. Such changes will have a large impact on how the state and its communities manage future winter storms and will affect the impact such storms have on the residents, roads, and utilities in the state.

3.5.2 Capabilities

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

According to the Ridgefield Department of Public Services website, town roads are treated with "Ice B' Gone" for de-icing. The town owns several plow trucks. Town plowing is typically ahead of CT DOT plowing. Priority is given to plowing egresses to critical facilities. Homeowners, private associations, and businesses are responsible for plowing their own driveways and roads.

Prior to a winter weather event, the Town ensures that all warning/notification and communications systems are ready and ensures that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order. In some known problem areas, prestorm treatment is applied to roadways to reduce the accumulation of snow. The Town also prepares for the possible evacuation and sheltering of some populations that could be impacted by the upcoming storm (especially the elderly and special needs persons).

Town officials noted during the public meeting for this planning process that, following the winter 2011 storms, Ridgefield developed a snow removal and response protocol for municipal buildings. A professional engineer performed calculations to determine safe snow thresholds for the roofs and identified when clearing should occur. This will help to reduce roof collapses.

Actions Completed and New Capabilities

Ridgefield continues to maintain winter storm capabilities.

3.5.3 Vulnerabilities and Risk Assessment

After a storm, snow piled on the sides of roadways can inhibit sight lines and reflect a blinding amount of sunlight. When coupled with slippery road conditions, poor sightlines and heavy glare create dangerous driving conditions. Stranded motorists, especially senior and/or handicapped citizens, are at particularly high risk of injury or death from exposure during a blizzard. The elderly population in Ridgefield, in particular, is susceptible to the impacts created by winter storms due to resource needs (heat, electricity loss, safe access to food, etc.).

The structures and utilities in the Town of Ridgefield are vulnerable to a variety of winter storm 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. Drifting snow can occur after large storms, but the effects are generally mitigated through municipal plowing efforts.

It is possible that several thousand members of the population impacted by a severe winter storm could consist of the elderly, a few thousand could consist of linguistically isolated households, and several thousand could be disabled. It is important for Ridgefield's emergency personnel to continue to be prepared to assist these special populations during emergencies such as winter storms.

No critical facilities are believed to be more susceptible to winter storm damage than any other. Some critical facilities are more susceptible than others to flooding damage due to winter storms.

The snowfall, sleet, freezing rain, and rain that affected Connecticut during the 2010-2011 winter season proved to be catastrophic for a number of buildings. With severely low temperatures coupled with the absence of the removal of snow and ice buildup from roofs of buildings in Connecticut, numerous roofs collapsed during the winter season.

During the snow load disaster in January 2011, significant snow removal was done throughout the town, including the town buildings and schools. East Ridge Middle School experienced some minor cracking of walls, and an engineer was dispatched to investigate. The school did not sustain any major damage. A few barns collapsed in town. As a result of this event, the town developed a snow removal protocol for its municipal and school roofs.

Changes and Improvements

The town has made several improvements in regard to wind and flooding, which could also be impacts related to winter storms and nor'easters.

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. They can be highly destructive, uncontrollable fires. 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."

Hazards associated with wildfires include property damage and loss of habitat. According to the USGS, wildfires can increase the potential for flooding, debris flows, or landslides; increase pollutants in the air; temporarily destroy timber, foliage, habitats, scenic vistas, and watershed areas; and have long-term impacts such as reduced access to recreational areas, destruction of community infrastructure, and reduction of cultural and economic resources.

Wildfires are considered a likely event each year but, when one occurs, it is generally contained to a small range with limited damage to nonforested areas.

In addition, Ridgefield, 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.

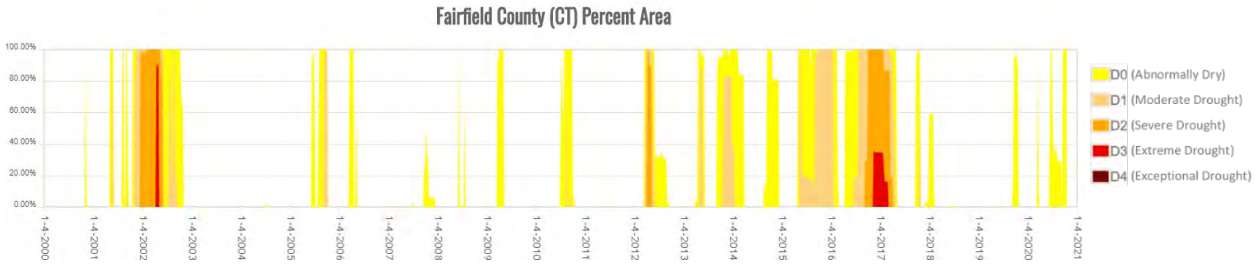

Figure 3-1: USDM Drought Time Series for Fairfield County

The 2019 Connecticut Natural Hazard Mitigation Plan assumes that the State of Connecticut has a medium probably 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

Mitigation for wildland fire control is typically focused on Fire Department training and maintaining an adequate supply of equipment.

The Connecticut DEEP Division of Forestry monitors the weather each day during nonwinter months as it relates to fire danger. This allows the DEEP and the Town to monitor the drier areas of the state to be prepared for forest fire conditions. Forest fire danger levels are classified as low, moderate, high, very high, or extreme. In addition, the National Weather Service 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.

The Ridgefield Fire Department goes to the fires whenever possible. This proactive approach is believed to be effective for controlling wildfires.

The Connecticut DEEP Open Burning Program requires designation of certified Open Burning Officials in each municipality. This individual oversees permitting of open burning.

Regulations regarding fire protection are outlined in the *Subdivision Regulations*:

- ***Section 4-8*** states that the arrangement of streets shall provide for the possible future continuation thereof into adjacent properties when such continuation shall be advisable for the convenient movement of traffic, effective fire protection, or efficient provision for public utilities, or where such continuation is in accordance with the plan of development.
- ***Section 4-11*** requires streets to be situated in a manner that provides suitable access for firefighting.
- ***Section 6-6*** outlines application requirements and requires provisions for water supply, stormwater management, sewage disposal and fire protection.

The town POCD identifies a need for continued improvements to the hydrant and non-hydrant water supply areas including the addition of hydrants, dry hydrants and cisterns where possible and the continued monitoring of large single-family home construction in non-hydrant areas.

Actions Completed and New Capabilities

The Town has made significant changes in its fire protection capabilities, and additional changes are underway. Town capabilities for fire suppression include:

- Aquarion Water Company has been extending its system and consolidating small systems in the northern part of the town.
- The Town is working with Aquarion to get fire hydrants installed where they were not previously installed.
- The former Rural Water and Topstone Water systems (now owned by Aquarion) are being upgraded to larger-diameter water mains.
- A water main may be extended to Branchville School, which would allow retirement of the school water system.
- Cisterns are required by the fire marshal for new developments that do not have access to the Aquarion system.
- Mutual aid agreements are in place for firefighting.
- Open burning is allowed by permit only.
- The Conservation Commission administers a ranger program to patrol open space and parks.

3.6.3 Vulnerabilities and Risk Assessment

Traditionally, the highest forest fire danger in Connecticut occurs in the spring from mid-March to mid-May. The worst wildfire year for Connecticut in the recent past occurred during the extremely hot and dry summer of 1999. Over 1,733 acres of Connecticut burned in 345 separate wildfires, an average of about five acres per fire. Only one wildfire occurred between 1994 and 2003 that burned over 300 acres, and a wildfire in 1986 in the Mattatuck State Forest in the town of Watertown, Connecticut burned 300 acres.

The Town of Ridgefield is generally considered a moderate-risk area for wildfires. Wildfires are of particular concern in outlying areas without public water service and other areas with poor access for fire-fighting equipment. The Pine Mountain area in northern Ridgefield is at risk for wildfires. Sometimes they reach 100+ acres in size, and multiple fires have occurred there. A wildfire at Bear Mountain, also in northern Ridgefield, was allowed to burn to completion because it was unsafe to try and stop it. Bear Mountain is also considered a high-risk area. Wildfire Risk Areas are mapped in Figure 3-2.

As suggested by the historic record, 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, it is believed that this average value for a drought year and the extreme value are applicable to the town as well.

The Wildland-Urban Interface (WUI) index is used to identify areas that may be at greater risk of wildfires based on the density of development in comparison to the amount of wildfire prone vegetation. Outside of the developed southcentral area of town, as well as those areas outside of the Aquarion service area, could be considered at greater risk due to moderate to high levels of development intermixed with fire prone vegetation. However, given firefighting capacity and water availability, it is likely that the town has effective capabilities to minimize damage from fires that may occur.

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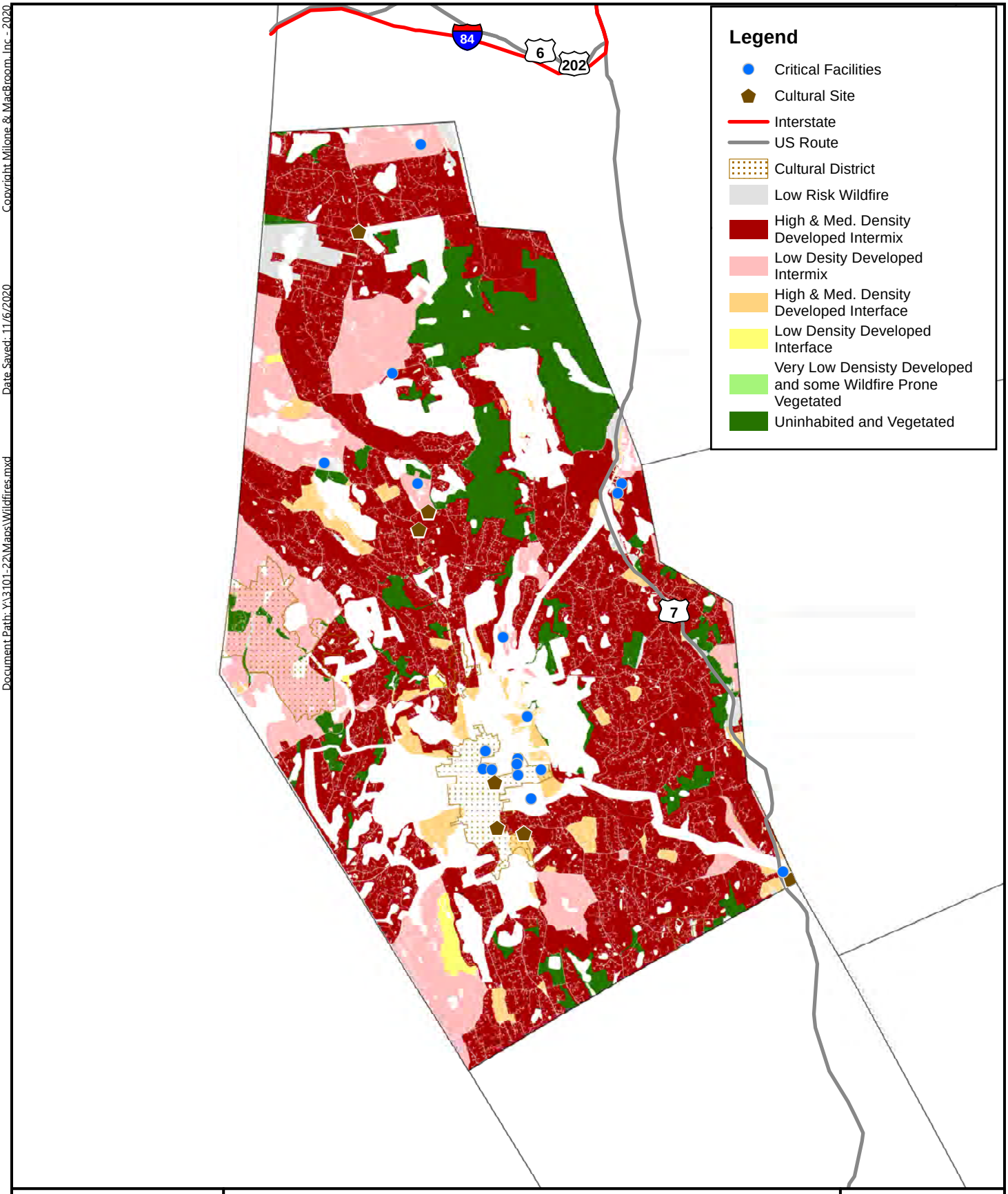

MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

Wildland-Urban Interface: Wildfire Risk Areas

WestCOG Hazard Mitigation Plan
Town of Ridgefield

NPS: Cultural Resources
Wildland-Urban Interface:USFA

N

0 3,500 7,000
Feet

SCALE	1 " = 7,118 '
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PROJ. NO.	3101-22

FIG. 3-2

3.7 EARTHQUAKES AND LANDSLIDES

3.7.1 Setting

The entire Town of Ridgefield is susceptible to earthquake damage. However, even though earthquake damage has 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.

Earthquakes can cause buildings and bridges to collapse; disrupt gas, electric and telephone lines; and often cause landslides, flash floods, fires, avalanches, and tsunamis. Earthquakes can occur at any time without warning.

According to the 2019 *Connecticut Natural Hazard Mitigation Plan Update*, Connecticut is at a low to moderate risk for experiencing an earthquake of a magnitude greater than 3.5 and at a moderate risk of experiencing an earthquake of a magnitude less than 3.0 in the future. No earthquake with a magnitude greater than 3.5 has occurred in Connecticut within the last 30 years, and the USGS currently ranks Connecticut 43rd out of the 50 states for overall earthquake activity.

3.7.2 Capabilities

The Connecticut Building Codes include design criteria for buildings specific to each municipality as adopted by the Building Officials and Code Administrators (BOCA). These include the seismic coefficients for building design in the Town of Ridgefield. The Town has adopted these codes for new construction, and they are enforced by the Building Official. Due to the infrequent nature of damaging earthquakes, land use policies in the Town do not directly address earthquake hazards. However, various documents do indirectly discuss areas susceptible to earthquake damage and regulations that help to minimize potential earthquake damage. For example, the Subdivision and Zoning Regulations require that soil erosion and sediment control plans be developed for proposed projects.

Actions Completed and New Capabilities

The town has established backup information storage in the event municipal buildings are damaged during an earthquake, and have also developed plans for working capabilities in the event of building damage.

3.7.3 Vulnerabilities and Risk Assessment

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.

Some areas in Ridgefield are underlain by sand and gravel, particularly within the Norwalk River and Titicus River sub-regional basins. Structures in these areas are at increased risk from

earthquakes due to amplification of seismic energy and/or collapse. The best mitigation for future development in areas of sandy material may be application of the most stringent building codes or possibly the prohibition of new construction. However, many of these areas occur in floodplains associated with the various streams and rivers in Ridgefield, so they are already regulated. The areas that are not at increased risk during an earthquake due to unstable soils are the areas underlain by glacial till, which includes most of the town.

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. For this Plan, dam failure has been addressed separately in Section 9.0.

A series of earthquake probability maps was 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 Ridgefield. Results are presented in Table 3-3 below.

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

Time Frame (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% to 2%
250	10% to 12%	2% to 3%
350	12% to 15%	3% to 4%

Changes and Improvements

Ridgefield has improvement their remote work and data storage capacities.

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	Dept	Status	Notes
1	Pursue funding to acquire backup generators for critical facilities such as the town hall.	OEM, PW	Completed	This action is complete; the Town would like to acquire additional generators.
2	Pursue funding to conduct necessary repairs to the Spruce Mountain Danbury/Ridgefield/DEMHS radio facility.	OEM, PW	Completed	This action is complete.
3	Pursue micro-grids at the high school / middle school complex and Town Hall / EOC / Fire Department	OEM	Carry Forward	The Town would like to evaluate this. A grants coordinator is needed.
4	Utilize the CT Alert emergency notification system to its fullest capabilities	OEM	Capability	The town utilizes CT Alert on an ongoing basis; however, the Town is evaluating updating its subscription to add Everbridge services that include messages related to response and recovery. A new action will be carried forward
5	Encourage residents to purchase and use NOAA weather radios with alarm features	OEM	Completed	The Town encourages the purchase of NOAA weather radios through its general emergency preparedness outreach. Other technology is available as well. A new action exploring utilizing a weather monitoring service to alert employees of dangerous weather conditions will be added.
6	Disseminate informational pamphlets regarding natural hazards to public locations	OEM	Capability	Ongoing capability.
7	Review potential evacuation routes to ensure timely migration of people seeking shelter in all areas of town.	OEM	Capability	Ongoing capability. WestCOG has assisted in this, as well, working with the DEMHS regions.
8	Incorporate elements of this hazard mitigation plan into the Plan of Conservation and Development when it is updated in 2020	First Selectman	Completed	Glen Chalder did this for the Town during the POCD Update. In particular, the Town added the importance of the ongoing drainage studies.

#	Action	Dept	Status	Notes
9	Update the Town's Floodplain regulations to reflect the most recent recommendations from the CT DEEP	P&Z	Completed	Complete
10	Encourage property owners to purchase flood insurance under the NFIP and to report claims when flooding damage occurs.	First Selectman	Capability	Information available on Town website and through other public outreach. Town considers this to be a capability.
11	Evaluate floodprone properties along the Norwalk River, Titicus River and Ridgefield Brook to determine potential flood damage reduction methods.	PW	Drop	Local, State, and NRCS representatives have met to discuss flood risks. Overall, the community does not prefer structural methods for flood control. The removal of the Fox Hill Dam, if it occurs, will have a substantial impact on the adjacent and downstream properties.
12	Pursue funding for home elevations and or acquisitions should any residents become interested. The home along Wooster Street near the Titicus River may be a good candidate for elevation.	PW	Carry Forward with Revisions	Acquisitions have been considered for some properties, especially where projects may result in changes to private properties. However, not much progress has been made in this area. Action is dropped and replaced with an action to develop a grants coordinator position.
13	Forward technical assistance from FEMA, regarding floodproofing, to the commercial properties prone to flooding, such as Precision Brake on Route 7.	OEM	Carry Forward with Revisions	The Town believes that this should be conducted with cooperation and participation of CT DEEP or DEMHS.
14	Work with CT DOT to determine whether flood mitigation methods are feasible at the Metro-North Railroad, Branchville Station, such as berm construction and/or floodproofing to reduce flood risk.	PW	Drop	The Town leases the property from the DOT. The burden of construction should be placed on the DOT. The construction of a berm in this area will have a substantial impact on the area's floodplain and may not be feasible or permitted. Drop action in favor of a different approach for risk reduction.
15	Ensure that future development within the Branchville area and at the Schlumberger site in downtown Ridgefield is flood damage resistant due to the proximity to flood risk zones.	P&Z	Completed	The former Schlumberger site is town-owned and is not at risk. The Town's zoning regulations and local implementation of the State Building Code require flood damage resistant construction in flood zones.

#	Action	Dept	Status	Notes
16	Development reviews must ensure that commercial development north of downtown does not contribute to downstream flooding.	P&Z	Completed	The Town has adopted and implements new stormwater regulations in 2020, which will ensure new construction does not contribute to downstream flooding. Additionally, a drainage study of the downtown area is in progress.
17	Development reviews associated with construction upstream of the Casagmo Condominium Complex must ensure that additional impervious surfaces will not increase localized flooding.	P&Z	Completed	The Town has adopted and implements new stormwater regulations in 2020, which will ensure new construction does not contribute to downstream flooding. Additionally, a drainage study of the downtown area is in progress.
18	Work with ACOE and NYCDEP to support flood mitigation and channel improvements along the Titicus River.	P&Z	Carry Forward with Revisions	A grant will be required for this work. The Town should consider the use of a grant coordinator.
19	Evaluate the cost of joining FEMA's Community Rating System and calculate the benefits to residents.	First Selectman	Drop	The Town is likely not interested in CRS.
20	Ensure that the appropriate municipal personnel are trained in flood damage prevention methods.	P&Z	Carry Forward with Revisions	Modify to be more specific, such as attendance at DEEP, FEMA-deployed, and CAFM trainings.
21	Selectively pursue conservation recommendations listed in the Plan of Conservation and Development and other studies and documents.	First Selectman	Capability	Ongoing
22	Pursue acquisition of additional municipal open space in SHFAs and set it aside for greenways, parks, etc.	First Selectman	Capability	Ongoing
23	Review culvert and bridge conveyances based on Northeast Regional Climate Center guidance for increasing precipitation.	PW	Carry Forward with Revisions	This is a substantial effort and would require a grant to proceed. Rather than reviewing all conveyances, the Town will require consideration of NRCC rainfall figures during development of alternatives for new culvert or bridge repair or replacement projects.
24	Conduct a drainage study along George Washington Highway and consider replacing and increasing increase the capacity of culverts if the drainage study demonstrates a benefit from doing so.	PW	Drop	The Town likely does not see a need for GWH. Ridgebury Road is being fitted with new box culverts this year to replace collapsing and older metal pipes.

#	Action	Dept	Status	Notes
25	Replace the North Bridge and the Florida Hill Bridge at the Norwalk River if application of the Northeast Regional Climate Center guidance demonstrates a benefit from doing so.	PW	Carry Forward	Progress has been impeded by lack of capital funds. This work will require a grant to proceed.
26	Conduct a drainage study along Route 116 and Barlow Mountain Road and increase the capacity of the drainage system to reduce flooding impacts if the drainage study demonstrates a benefit from doing so.	PW	Drop	Risk is not believed present. Action can be dropped.
27	Replace and increase the capacity of the culverts along Bennett's Farms Road.	PW	Capability	Ongoing project.
28	Evaluate methods of reducing flood risk at Wilton Road East, Rowland Lane, Oreneca Road, Rippowam Road, Wooster Street, Spring Valley Road, Ledges Road, New Street at Route 7, Portland Avenue, and South Street.	PW	Carry Forward with Revisions	Progress has been impeded by lack of capital funds. This work will require a grant to proceed. Revise action to be more specific.
29	Ensure adequate barricades are available to block flooded streets in floodprone areas	OEM	Capability	Ongoing capability. The Highway Department does this.
30	Determine the elevation of the Ridgebury Fire House relative to the base flood elevation and evaluate whether floodproofing is warranted.	OEM, PW	Drop	The building is not believed at risk.
31	Provide town wide tree limb inspection and maintenance programs to ensure that the potential for downed power lines is diminished.	PW	Capability	Complete and ongoing. Annual budget is $400,000 plus additional as needed.
32	Pursue roof mitigation projects for critical facilities, such as improved roof coverings, roof shape or roof to wall connections.	PW	Complete	Roofs currently meet all state building codes.
33	Encourage the use of structural techniques related to mitigation of wind damage in new residential and commercial structures to protect new buildings to a standard greater than the minimum building code requirements. Require such improvements for new municipal critical facilities.	Building Official, OEM	Drop	Drop; the Town administers the State Building Code, and new municipal facilities are not planned.
34	Work with Eversource to strengthen utilities to minimize power outages during storm events.	PW	Capability	Ongoing capability.
35	Work with Eversource to determine the feasibility of placing non-conducting steel cables above the power lines to protect them from falling branches and trees.	PW	Drop	Bracing has been considered but the Town and Eversource decided to focus on trimming. This can be dropped.

#	Action	Dept	Status	Notes
36	Pursue funding for the installation of hurricane-rated windows at the Yanity Gymnasium to facilitate its use as a shelter for emergency personnel.	PW	Drop	It has been recommended that the windows be removed completely as they are not necessary. Drop action.
37	The Building Department should provide literature regarding appropriate design standards for wind.	Building Official, OEM	Capability	Ongoing capability.
38	Review and update the currently enacted EOP, evacuation plans, supply distribution plans, and other emergency planning documents for the Town as appropriate. Post general evacuation and shelter information on the Town website and in municipal buildings	OEM	Capability	Ongoing capability.
39	Post the snow plowing routes in Town buildings each winter to increase public awareness.	OEM, PW	Drop	WestCOG evaluated plowing routes for the region recently. The Town does not wish to notify residents of route priorities, as this may be confusing.
40	Emergency personnel should continue to identify areas that are difficult to access during winter storm events and devise contingency plans to access such areas during emergencies.	OEM	Capability	Ongoing
41	The Building Department should provide literature regarding appropriate design standards for mitigating icing, insulating pipes, and retrofits for flat-roofed buildings such as heating coils.	Building Official	Capability	Ongoing
42	Stringently regulate new residential development in areas prone to collapse.	P&Z	Capability	Ongoing
43	Ensure that municipal departments have adequate backup facilities in case earthquake damage occurs to municipal buildings.	OEM, PW	Complete	Backup plans are in place for the loss of a structure.
44	The town may consider bracing systems and assets inside critical facilities. This could help protect IT systems, important records and files.	OEM, PW	Drop	Redundancies are in place, and records are backed up to the cloud and other servers. Drop action.
45	File EOPs/EAPs with town departments and emergency personnel	OEM	Complete	Complete. Also, EAPs were filed with DEEP for town-owned dams two years ago and the Town has not received feedback.
46	Include dam failure inundation areas in the CT Alert emergency notification system contact database	OEM	Carry Forward with Revisions	This may be considered after feedback from DEEP. Revise or carry forward.
47	Refer private dam owners to State and federal resources regarding effective maintenance strategies.	OEM	Capability	Ongoing; this is DEEP responsibility.

#	Action	Dept	Status	Notes
48	Coordinate with the owners of Mamanasco Lake Dam and Shadow Lake Dam to keep abreast of progress toward necessary maintenance activities.	OEM	Complete	These dams are Town-owned. Maintenance plans have been developed for these dams. The action is complete.
49	Increase the availability of water sources in the town's area of high-risk areas.	Fire Department	Capability	Complete and ongoing. Aquarion Water Company has been extending its system and consolidating small systems in the northern part of the town. The Town is working with Aquarion to get fire hydrants installed where they were not previously installed. Cisterns are required by the fire marshal for new developments that do not have access to the Aquarion system.
50	The Fire Departments should coordinate with the water company to identify areas where fire-fighting capacity may be limited due to lack of water pressure or storage. Deficiencies should be addressed as they are identified, and funding allows.	Fire Department	Complete / Capability	Complete and ongoing. Aquarion Water Company has been extending its system and consolidating small systems in the northern part of the town. The Town is working with Aquarion to get fire hydrants installed where they were not previously installed. The former Rural Water and Topstone Water systems (now owned by Aquarion) are being upgraded to larger-diameter water mains. A water main may be extended to Branchville School, which would allow retirement of the school water system.
51	Require source of fire protection water, such as cisterns or dry wells when municipal water service is not available for residential or commercial building development.	Fire Department	Complete / Capability	Complete and ongoing. Cisterns are required by the fire marshal for new developments that do not have access to the Aquarion system.
52	Provide outreach programs on how to properly manage burning and campfires on private property.	OEM, Fire Department	Capability	Ongoing. The Town requires a permit for open burning and outreach is continuous.
53	Patrol Town-owned open space and parks to prevent unauthorized campfires.	Fire Department	Capability	Ongoing. The Conservation Commission runs a ranger program to accomplish this.

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 RFD-01	
Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, CT DEEP
Timeframe	2021
Priority	High

Action RFD-02	
Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, CT DEEP
Timeframe	2021
Priority	High

Action RFD-03	
Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, CT DEEP
Timeframe	2021
Priority	High

Action RFD-04	
Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives: - Disseminate a toolkit for pre-disaster business preparedness. - Revise regulations to promote Low Impact Development. - Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.	
Lead	BOS
Cost	$0 - $25,000
Funding	Operating Budget, Sustainable CT Community Match Fund
Timeframe	2021
Priority	High

Action RFD-05	
Collaborate with CIRCA on the "Resilient Connecticut" project	
Lead	BOS
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2022
Priority	High

Action RFD-06	
Coordinate with CT SHPO to conduct outreach to owners of historic properties to educate them on methods of retrofitting historic properties to be more hazard-resilient while maintaining historic character.	
Lead	Planning
Cost	$0 - $25,000
Funding	Operating Budget, CT SHPO
Timeframe	2022
Priority	High

Action RFD-07	
Ensure that the appropriate municipal personnel are trained in flood damage prevention methods by becoming a CAFM member, and/or by attending DEEP, FEMA-deployed, or CAFM trainings.	
Lead	0
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2022
Priority	Med

Action RFD-08	
Revise floodplain zoning regulations to reflect the new State Building Code requirements for one foot of freeboard for construction in the 1% annual-chance flood zone.	
Lead	Planning
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action RFD-09	
Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	
Lead	Planning
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action RFD-10	
Compare local floodplain regulations with Revised State Model Flood Regulations to identify any remaining opportunities for improvement	
Lead	Planning
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action RFD-11	
Require consideration of the most recent Northeast Regional Climate Center rainfall statistics (precip.eas.cornell.edu) when developing alternatives for culvert and bridge replacement designs and sizes.	
Lead	PW
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action RFD-12	
Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2023
Priority	Low

Action RFD-13	
Require a new town grant coordinator (see Grant Coordinator action) work with ACOE and NYCDEP to support flood mitigation and channel improvements along the Titicus River.	
Lead	0
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2024
Priority	Low

Action RFD-14	
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 RFD-15	
Work with the State (DEEP or DEMHS), or utilize State materials, to provide technical assistance regarding floodproofing to the commercial properties prone to flooding, such as Precision Brake on Route 7.	
Lead	0
Cost	$0 - $25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2024
Priority	Low

Action RFD-16	
Coordinate with CT DEEP to include dam failure inundation areas in the CT Alert emergency notification system contact database.	
Lead	0
Cost	$25,000 - $50,000
Funding	Operating Budget, CT DEMHS
Timeframe	2024
Priority	Med

Action RFD-17	
Complete the ongoing drainage study of the Downtown area and implement recommendations of that study to mitigate flood damage in the neighborhood.	
Lead	0
Cost	$25,000 - $50,000
Funding	Capital Improvement Plan, FEMA Grant
Timeframe	2024
Priority	Med

Action RFD-18	
Conduct a feasibility study for microgrids at the high school / middle school complex and Town Hall / EOC / Fire Department	
Lead	0
Cost	$25,000 - $50,000
Funding	Operating Budget
Timeframe	2024
Priority	Low

Action RFD-19	
Work with CT DEEP to validate and/or correct the RL list and update the mitigation status of each listed property.	
Lead	Planning
Cost	$25,000 - $50,000
Funding	FEMA Grant
Timeframe	2024
Priority	Low

Action RFD-20	
Conduct a study to identify flood risk reduction alternatives for Wilton Road East.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-21	
Conduct a study to identify flood risk reduction alternatives for Rowland Lane.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-22	
Conduct a study to identify flood risk reduction alternatives for Oreneca Road.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-23	
Conduct a study to identify flood risk reduction alternatives for Rippowam Road.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-24	
Conduct a study to identify flood risk reduction alternatives for Wooster Street.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-25	
Conduct a study to identify flood risk reduction alternatives for Spring Valley Road.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-26	
Conduct a study to identify flood risk reduction alternatives for Ledges Road.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-27	
Conduct a study to identify flood risk reduction alternatives for New Street at Route 7.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-28	
Conduct a study to identify flood risk reduction alternatives for Portland Avenue.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-29	
Conduct a study to identify flood risk reduction alternatives for South Street.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Operating Budget, Grant
Timeframe	2024
Priority	Low

Action RFD-30	
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 RFD-31	
Pursue funding for home elevations and or acquisitions should any residents become interested. The home along Wooster Street near the Titicus River may be a good candidate for elevation.	
Lead	0
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Med

Action RFD-32	
Develop a grant coordinator position within the town.	
Lead	0
Cost	$50,000 - $100,000
Funding	Operating Budget
Timeframe	2026
Priority	Low

Action RFD-33	
Replace the North Bridge and the Florida Hill Bridge at the Norwalk River if application of the Northeast Regional Climate Center guidance demonstrates a benefit from doing so.	
Lead	PW
Cost	More than $1 million
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

APPENDIX A

Appendix A: STAPLEE Matrix

#	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	
RFD-01	Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.	CT DEEP Small Business Chem	EM, BOS	$0 - $25,000	Operating Budget, CT DEEP	2021	1	1	1	0	1	1	1	0	0	0	0	0	0	0	8
RFD-02	Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.	CT DEEP Small Business Chem	EM, BOS	$0 - $25,000	Operating Budget, CT DEEP	2021	1	1	1	0	1	1	1	0	0	0	0	0	0	0	8
RFD-03	Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.	CT DEEP Small Business Chem	EM, BOS	$0 - $25,000	Operating Budget, CT DEEP	2021	1	1	1	0	1	1	1	0	0	0	0	0	0	0	8
RFD-04	Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives: - Disseminate a toolkit for pre-disaster business preparedness. - Revise regulations to promote Low Impact Development. - Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.	Sustainable CT	BOS	$0 - $25,000	Operating Budget, Sustainable CT Community Match Fund	2021	1	1	1	1	0	1	1	0	0	0	0	0	0	0	8
RFD-05	Collaborate with CIRCA on the "Resilient Connecticut" project	ResilientCT	BOS	$0 - $25,000	Operating Budget	2022	1	1	1	0	0	1	1	0	0	0	0	0	0	0	7
RFD-06	Coordinate with CT SHPO to conduct outreach to owners of historic properties to educate them on methods of retrofitting historic properties to be more hazard-resilient while maintaining historic character.	SHPO	Planning	$0 - $25,000	Operating Budget, CT SHPO	2022	1	1	1	1	0	1	0	0	0	0	0	0	0	0	7
RFD-07	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.	SHPO	Planning	$25,000 - $50,000	CT SHPO	2024	1	1	1	1	0	1	0	0	0	0	0	0	0	0	7
RFD-08	Ensure that the appropriate municipal personnel are trained in flood damage prevention methods by becoming a CAFM member, and/or by attending DEEP, FEMA-deployed, or CAFM trainings.	Municipal Capacities		$0 - $25,000	Operating Budget	2022	0	1	1	1	1	0	1	0	0	0	0	0	0	0	6
RFD-09	Coordinate with CT DEEP to include dam failure inundation areas in the CT Alert emergency notification system contact database.	Emergency Response		$25,000 - $50,000	Operating Budget, CT DEMHS	2024	1	1	1	0	1	1	0	0	0	-1	0	0	0	0	6
RFD-10	Complete the ongoing drainage study of the Downtown area and implement recommendations of that study to mitigate flood damage in the neighborhood.	Drainage		$25,000 - $50,000	Capital Improvement Plan, FEMA Grant	2024	1	1	0	1	1	1	1	0	0	0	0	0	-1	0	6
RFD-11	Pursue funding for home elevations and or acquisitions should any residents become interested. The home along Wooster Street near the Titicus River may be a good candidate for elevation.	Floodproofing & Elevation		$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	1	1	1	1	1	-1	0	0	0	0	-1	0	6
RFD-12	Revise floodplain zoning regulations to reflect the new State Building Code requirements for one foot of freeboard for construction in the 1% annual-chance flood zone.	Floodplain Management Regulations	Planning	$0 - $25,000	Operating Budget	2023	0	1	1	0	1	1	0	0	0	0	-1	0	0	0	5
RFD-13	Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	Floodplain Management Regulations	Planning	$0 - $25,000	Operating Budget	2023	0	1	1	0	1	1	0	0	0	0	-1	0	0	0	5
RFD-14	Compare local floodplain regulations with Revised State Model Flood Regulations to identify any remaining opportunities for improvement	Floodplain Management Regulations	Planning	$0 - $25,000	Operating Budget	2023	0	1	1	0	1	1	0	0	0	0	-1	0	0	0	5
RFD-15	Require consideration of the most recent Northeast Regional Climate Center rainfall statistics (precip.eas.cornell.edu) when developing alternatives for culvert and bridge replacement designs and sizes.	NRCC	PW	$0 - $25,000	Operating Budget	2023	0	1	0	0	0	1	1	0	0	-1	0	0	0	0	4
RFD-16	Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	RLPs	EM, BOS	$0 - $25,000	Operating Budget, FEMA Grant	2023	0	1	1	0	1	1	0	0	0	-1	0	0	0	0	5
RFD-17	Conduct a feasibility study for microgrids at the high school / middle school complex and Town Hall / EOC / Fire Department	Energy Resiliency & Backup Power		$25,000 - $50,000	Operating Budget	2024	1	1	1	1	1	1	0	0	-1	-1	0	0	0	0	5

#	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	
RFD-18	Work with CT DEEP to validate and/or correct the RL list and update the mitigation status of each listed property.	RLPs	Planning	$25,000 - $50,000	FEMA Grant	2024	0	0	1	0	1	1	0	0	0	0	0	0	0	0	4
RFD-19	Conduct a study to identify flood risk reduction alternatives for Wilton Road East.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-20	Conduct a study to identify flood risk reduction alternatives for Rowland Lane.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-21	Conduct a study to identify flood risk reduction alternatives for Oreneca Road.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-22	Conduct a study to identify flood risk reduction alternatives for Rippowam Road.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-23	Conduct a study to identify flood risk reduction alternatives for Wooster Street.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-24	Conduct a study to identify flood risk reduction alternatives for Spring Valley Road.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-25	Conduct a study to identify flood risk reduction alternatives for Ledges Road.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-26	Conduct a study to identify flood risk reduction alternatives for New Street at Route 7.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-27	Conduct a study to identify flood risk reduction alternatives for Portland Avenue.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-28	Conduct a study to identify flood risk reduction alternatives for South Street.	Flood Study	DPW	$25,000 - $50,000	Operating Budget, Grant	2024	0	1	1	1	1	1	0	0	-1	0	0	0	0	0	5
RFD-29	Annually conduct an emergency operations exercise for a local terrorism, sabotage, or mass casualty event.	Terrorism & Mass Casualty	EMD	$25,000 - $50,000	Operating Budget	2024	1	1	1	1	1	0	0	0	0	-1	0	0	0	0	5
RFD-30	Replace the North Bridge and the Florida Hill Bridge at the Norwalk River if application of the Northeast Regional Climate Center guidance demonstrates a benefit from doing so.	Bridge & Culvert	PW	More than $1 million	Capital Improvement Plan, FEMA Grant, Other Grant	2026	0	1	0	1	1	1	1	0	0	0	0	0	-1	0	5
RFD-31	Develop a grant coordinator position within the town.	Municipal Capacities		$50,000 - $100,000	Operating Budget	2026	1	1	1	0	0	1	0	0	0	0	0	0	-1	0	4
RFD-32	Require a new town grant coordinator (see Grant Coordinator action) work with ACOE and NYCDEP to support flood mitigation and channel improvements along the Titicus River.	Municipal Capacities		$0 - $25,000	Operating Budget	2024	0	1	0	0	0	1	0	0	0	0	0	0	0	0	4
RFD-33	Work with the State (DEEP or DEMHS), or utilize State materials, to provide technical assistance regarding floodproofing to the commercial properties prone to flooding, such as Precision Brake on Route 7.	Floodproofing & Elevation		$0 - $25,000	Operating Budget, FEMA Grant	2024	1	0	1	0	1	1	0	-1	0	-1	0	0	0	0	3

APPENDIX B

Appendix B: SVI Summary

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

The Town of Ridgefield, for this Climate Vulnerability Assessment (CVA) is considered a suburban 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 in town along several streams and rivers, such as along the Titicus River and the Miry Brook, there is continuously concern for riverine flooding. The larger rivers, along with the smaller streams in town, pose a flood risk to adjacent properties, whether it is a larger storm event or a short intense rainstorm. In addition, the town is also concerned with flooding as a result of poor drainage in some areas. With precipitation expected to increase due to climate change, flooding events may occur more frequently. Overall, flooding may continue, or become a larger issue with future shifts in precipitation.

Winter Storms

Ridgefield is largely residential with commercial properties along the main routes in town. Suburban communities are often impacted by strong winter storms in several ways; power outages from downed trees, accessibility issues, and icing concerns. 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

Much of the town relies on private wells for drinking water, with the exception of a larger system in the southern half of town, and some smaller systems in the northern areas of town. Therefore, impacts to water supply may be an issue to the town as temperatures rise in the 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 suburban 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 Ridgefield include:

- Private well owners
- Emergency access
- Agricultural operations

Secondary Impacts

Economic Impacts

With areas vulnerable to 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 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.

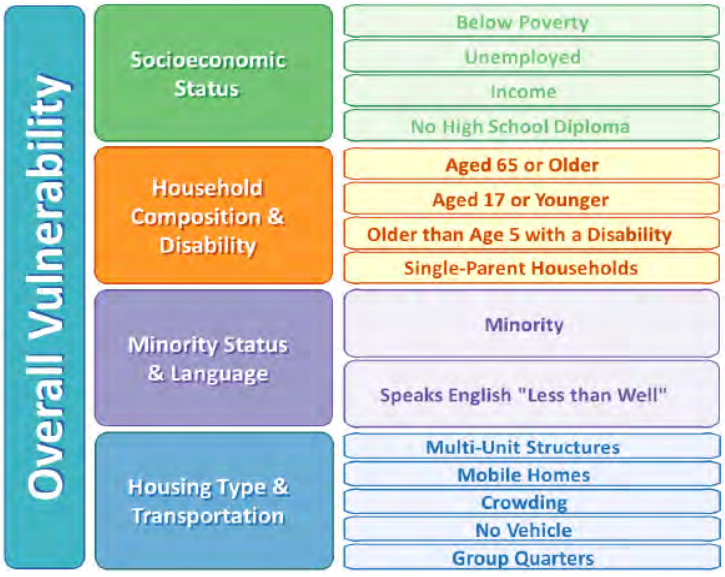

Figure 1: The CDC SVI Index Factors. Graphic: svi.cdc.com

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

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

Table 1: Ridgefield SVI Factor Rankings

	Overall SVI	Socioeconomic	Household Composition & Disability	Minority Status & Language	Housing Type & Transportation
RIDGEFIELD	.14	.04	.43	.18	.22

The Town of Ridgefield is considered to have a low level of vulnerability, with their most vulnerable population being based on household composition and disability. These vulnerable populations for the town are primarily identified in the two most eastern tracts, with housing and transportation vulnerable populations also being more concentrated within these two tracts.

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 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. Communities, including Ridgefield, should pay special attention to elderly or disabled populations, linguistically challenged population, and those that may need evacuation assistance due to lack of transportation. In addition to the SVI populations identified, the Connecticut Department of Public Health (DPH)[1] has identified at least four assisted living facilities and one convalescent home in Ridgefield.

[1] https://www.elicense.ct.gov/Lookup/LicenseLookup.aspx

Some 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.