HAZARD MITIGATION PLAN UPDATE
ANNEX FOR THE TOWN OF BOZRAH

Southeastern Connecticut Council of Governments
Multi-Jurisdictional Hazard Mitigation Plan Update

November 20, 2012

MMI #3570-05

Prepared for:

TOWN OF BOZRAH
1 River Road
Bozrah, Connecticut 06334
(860) 889-2689
www.munic.state.ct.us/bozrah/bozrah.htm

Prepared by:

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

MILONE & MACBROOM®

ACKNOWLEDGEMENTS

This HMP annex update could not have been completed without the time and dedication of the following individual at the local level:

William Ballinger — First Selectman, Local Coordinator
Town Hall
1 River Road
Bozrah, CT 06334
Phone: (860) 889-2689
Fax: (860) 887-5449
bozrah.w.ballinger@snet.net

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1.0 INTRODUCTION

1.1 Purpose of Annex

The purpose of this HMP annex is to provide an update to the hazard risk assessment and capability assessment provided in the previous HMP, and to evaluate potential hazard mitigation measures and prioritize hazard mitigation projects specific to mitigating the effects of hazards on the Town of Bozrah. Background information and the regional effects of pertinent hazards are discussed in the main body of the Southeastern Connecticut Council of Governments (SCCOG) Multi-Jurisdictional Hazard Mitigation Plan. Thus, this annex is designed to supplement the information presented in the Multi-Jurisdictional HMP with more specific detail for Bozrah and is not to be considered a standalone document.

The primary goal of this hazard mitigation plan annex is to identify particular vulnerability to hazards and potential mitigation measures for such hazards 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. Bozrah, with an approved Mitigation Plan, may apply for assistance from FEMA directly as a subgrantee through the state of Connecticut under the various grant programs.

1.2 Setting

Bozrah is a town of approximately 20 square miles that lies in northwestern New London County and is bordered by the City of Norwich to the east, the Town of Franklin to the north, the Town of Lebanon to the northwest, the Town of Colchester to the west, the Town of Salem to the southwest, and the Town of Montville to the south. Bozrah consists of the three villages of Fitchville (the town center), Leffingwell (a crossroad on Route 82), and Gilman (a mill village along Fitchville Road).

The most significant surface water bodies include the Yantic River which flows east-southeast across the northern portion of town before it confluences with Gardiner Brook at the impoundment known as Fitchville Pond near the intersection of Route 163 and Route 2. After the two watercourses join, the Yantic River flows east-southeast towards the center of Norwich where it converges with the Thames River. The two major transportation routes through town includes Route 2, which runs east-west through the northern half of town and Route 163 which runs north-south through the center of town from its intersection with Route 2.

1.3 Plan Development

The 2005 HMP and its annexes were developed through a series of meetings and the completion of written questionnaires, personal interviews, and workshops as described in the Multi-Jurisdictional HMP update. Since that time, the HMP has been available in municipal offices and available to emergency personnel. Residents have been encouraged to contact the First Selectman or the Fire Department with any concerns regarding emergency response or potential projects related to natural hazard damage.

Based on the existing plan, existing information, and hazards that have occurred since 2005, SCCOG determined that the following data collection program would be sufficient to collect data to update the Multi-Jurisdictional plan and each annex.

- The SCCOG issued a press release on November 20, 2011 announcing a public information meeting on the multi-jurisdictional HMP update. This press release was published in the Norwich Bulletin and The Day. This notice was also posted on the SCCOG website. The public information meeting was held on December 13, 2011 at the SCCOG office.

- A data collection meeting was held with the First Selectman, on January 31, 2012 to discuss the scope and process for updating the plan and to collect information. The meeting focused on reviewing each section of the existing hazard mitigation plan and annex, critical facilities, and various types of hazards that have affected Bozrah and that should be addressed in the update.

- The draft that is sent for State review will be posted on the Town of Bozrah's website (http://www.ctsprague.org) as well as the SCCOG website (www.seccog.org) for public review and comment. In addition, a hard copy will be made available in the SCCOG office in Norwich. A press release will announce the availability of the HMP for review. This will provide residents, business owners, and other stakeholders throughout the SCCOG region the opportunity to review and comment on a relatively complete draft with all annexes. Comments received from the public will be incorporated into the final draft where applicable following State and Federal comments.

The adoption of this HMP update by Town of Bozrah will be coordinated by SCCOG and the First Selectman. The HMP update must be adopted within one year of conditional approval by FEMA, or Bozrah will need to update the HMP and resubmit it to FEMA for review. The adoption resolution is located in Appendix A of this annex.

1.4 Progress Monitoring

Following adoption, the First Selectman will continue to administer this HMP (as it has since 2005) under the authority of the Town of Bozrah Board of Selectmen and will be the local coordinator of the HMP. The First Selectman will coordinate with responsible departments as listed in Table 11-1 and ensure that the recommendations of this HMP are considered or enacted. Refer to Section 1.8 of the Multi-Jurisdictional HMP for a description of how the local coordinator will perform progress monitoring. The majority of recommendations in this annex can be accomplished within or with only a slight increase in the operating budgets of the various departments. Projects that require capital improvements or additional funding will need to be approved by the Board of Selectmen.

The HMP will be on file in Town Hall at the First Selectman's Office, available to all departments, to assist in guiding growth decisions. See Section 2.5 for recommendations related to integrating the findings of this HMP into additional town planning documents. Bozrah will continue to encourage town residents to contact the First Selectman with concerns related to natural hazards or emergency response via the town's website.

The town will review the status of Plan recommendations each year. The First Selectman will be in charge of overseeing recommended projects and coordinating an annual meeting with

applicable departments (those listed in Table 11-1) and other interested departments. Refer to Section 1.8 of the Multi-Jurisdictional HMP for a list of matters to be discussed at the annual meeting, including a review of each recommendation and progress achieved to date, or reasons for why the recommendation has not been enacted. The First Selectman will keep a written record of meeting minutes and the status of the recommendations. These records of progress monitoring will form the basis for the next HMP update.

Bozrah understands that the multi-jurisdictional HMP and this annex will be effective for five years from the date of FEMA approval of the first SCCOG jurisdiction regardless of the date of adoption by SCCOG. The First Selectman will coordinate with SCCOG for the next HMP update which is expected to occur in 2016-2017.

2.0 COMMUNITY PROFILE

2.1 Physical Setting

Bozrah is located in the northwestern corner of the SCCOG planning area. Elevations range from approximately 540 at the top of Scott Hill Road near the town line with Lebanon to approximately 110 feet near the Franklin/Norwich town line and the Central Vermont Railroad. The most densely populated area of town surrounds the Yantic River, Gardiner Brook in the vicinity of Fitchville Pond at the intersection of Routes 2 and 163, while outlying areas are rural. The town is mostly undeveloped with many hills and forestland.

Geology is important to the occurrence and relative effects of natural hazards such as earthquakes. Thus, it is important to understand the geologic setting and variation of bedrock and surficial formations in lands underlying Bozrah. Bozrah lies above seven bedrock formations which largely trend northeast to southwest across the town. Two faults that are oriented east-west near the town line with Montville pinch the formations into east-west and v-orientations in the south-southeastern section of town. The majority of the town is underlain by the Hebron Gneiss formation. The Hebron Gneiss formation consists of dark-grey schist and greenish grey fine to medium-grained calc-silicate gneiss, while the remaining six formations are comprised of gneiss, gabbro, and schist.

The Town's surficial geologic formations include glacial till and stratified drift. Refer to the Multi-Jurisdictional HMP for a generalized view of surficial materials. Till contains an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. Areas adjacent to the Austin Brook, Mineral Spring Brook, Bentley Brook, the Yantic River, and Gardiner Brook have fairly extensive areas underlain by sand, sand and gravel, fines, alluvial sediment, or gravel. The amount of stratified drift present is important as areas of stratified materials are generally coincident with floodplains. These materials were deposited at lower elevations by glacial streams, and these valleys were later inherited by the larger of our present day streams and rivers. However, the smaller glacial till watercourses can also cause flooding. The amount of stratified drift also has bearing on the relative intensity of earthquakes and the likelihood of soil subsidence in areas of fill.

2.2 Land Use and Development Trends

Bozrah has been a rural community subsisting on agriculture and small businesses since it was incorporated in 1786. Population growth was very limited until the 1960s. Following the completion of Interstate 95 in 1956, the town began to attract residents working in nearby communities and wanting to live in a rural area. Residential and commercial development further increased with the completion of Interstate 395 and the highway portion of Route 2.

According to the "2006 Land Cover by Area" UConn Center for Land Use Education and Research data for the town, only approximately 9% of town was developed. That leaves 91% of the town open for development. However, a portion of the hypothetically developable land is steep slopes, water, wetlands, protected open space, and the like that prohibit this land from being developed.

The Stockhouse Road/Rachel Drive Commerce Park is the most significant area of development in Bozrah. Commercial/industrial development is the town's intended uses in this area. Rachel

Drive was recently completed and the lots are ready for development. The town desires the extension of sewers into this area, which would facilitate development. The Route 82 corridor in the southern part of town is another area of potential development.

With respect to future residential development, several large farms owned by senior citizens could possibly be subdivided in the coming years. These parcels have significant roadway frontage and could be developed with eight or nine homes without needing new internal roads. Nonetheless, nothing is pending our approved at present.

It is likely that Bozrah will continue to be a rural-dominant community in the future, with limited industrial and commercial development primarily focused in the areas mentioned above. The housing stock in Bozrah consists primarily of single family homes. No subdivisions have been built since 2005, and developments are not currently proposed in the town. The 2002 *Plan of Conservation and Development* is due for renewal and a one-year extension to 2013 was approved. The next edition of the plan may help guide development.

2.3 Drainage Basins, Hydrology, and Geology

As previously stated, the Yantic River and Gardiner Brook are the primary watercourses in Bozrah. Their orientations are described in Section 1.2. Major tributaries include Austin Brook, Bentley Brook, and Trading Cove Brook (which forms the southern town line). Besides the Yantic River, there are approximately 15 named water bodies and many unnamed small tributaries in Bozrah.

There are a total of five subregional watershed basins in Bozrah. The subregional basins are Gardner Brook, Pease Brook, Susquetonscut Brook, Trading Cove Brook, and the Yantic River. The Yantic River, Gardner Brook and Trading Cove Brook dominate almost all of town. The Gardner Brook basin covers approximately 38% of town, while the Yantic River basin covers approximately 36% of town and the Trading Cove Brook basin comprises approximately 25% of Bozrah. The Pease Brook basin accounts for approximately 2% of town land, while the Susquetonscut Brook basin accounts for less than 1% of land area.

The extreme northwest corner drains to the Pease Brook drainage basin and the extreme northeast corner drains to the Susquetonscut Brook drainage basin, while the Yantic River basin stretches from the northern town line south to the Gardner Brook basin and southeast to the Trading Brook Cove basin.

The three dams with the most significant dam classifications are the Fitchville Pond Dam (Class C), the Yantic River Dam (Class B), and the Gardner Lake Dam (Class B). According to the 1996 “Connecticut Dams” shapefile available from the Connecticut DEEP, additional dams in the Gardiner Brook basin include two unclassified and one Class A dam and in the Trading Cove Brook basin two Class A and one Class BB dam located on tributaries.

2.4 Governmental Structure

Bozrah is governed by a Town Meeting and Board of Selectmen form of government. The authority of town officials is granted by Connecticut General Statutes. The Town Meeting is the legislative body of the town and the Board of Selectmen is responsible for the administration of town policies. The First Selectman is the chief elected official and is responsible for the day-to-

day administration of Bozrah. The First Selectman also acts as the tree warden, Chief of Police (Police services are provided by Troop K in Colchester), and the Public Works Director.

The Town of Bozrah has a boards and commissions that can take an active role in hazard mitigation, including the Inland Wetlands Commission, the Planning and Zoning Commission, the Zoning Board of Appeals, and the Board of Selectmen. Departments and commissions common to all municipalities in SCCOG were described in Section 2.8 of the Multi-Jurisdictional HMP. More specific information for the departments and commissions of the Town of Bozrah is noted below:

- The Building Official reviews plans for new development and inspects the work to ensure it meets current building codes.

- The Bozrah Volunteer Fire Company provides fire suppression, fire prevention, rescue, and hazardous materials response services to the town.

- The Inland Wetlands Commission is the Inland Wetlands Regulatory Agency for the Town of Bozrah and reviews plans for compliance with said regulations and maintains the town's inland wetlands map.

- The Planning & Zoning Commission reviews land use applications, zoning regulation amendments, planning and development projects, and grant opportunities to ensure that development and growth in the town is consistent with existing land use, environmental policy, and the objectives of the *Plan of Conservation and Development*. They are assisted by the Zoning Enforcement Officer. When planning services are needed, they are contracted through SCCOG.

- The Public Works Department consists of the First Selectman and a small staff. The department provides services including maintaining safe, efficient and well-maintained infrastructure of roads and bridges, snow removal and deicing on roads, hazardous trees and tree limb removal in right-of-ways, and maintaining and upgrading storm drainage systems to prevent flooding caused by rainfall.

- The Zoning Board of Appeals reviews projects that were denied by the Planning & Zoning Commission or were cited by the Zoning Enforcement Officer, as well as those that require variances.

The roles of Town departments have not changed since the time of the previous HMP. Thus, the Town of Bozrah is technically, financially, and legally capable of implementing mitigation projects for hazards to the extent that funding is available.

2.5 Review of Existing Plans and Regulations

Bozrah has different plans and regulations that suggest or create policies related to hazard mitigation. These policies and regulations are outlined in the Emergency Operations Plan (2007), *Plan of Conservation and Development* (2002), Zoning Regulations, and Inland Wetland Regulations. The Zoning Regulations were recently updated to incorporate new NFIP requirements.

Emergency Operations Plan

The town has an Emergency Operations Plan (EOP) that is updated and certified by the First Selectman annually. This document provides general procedures to be instituted by the First Selectman and/or designee and the Fire Department in case of an emergency. Emergencies can include but are not limited to hazard events such as hurricanes and nor'easters. The EOP is directly related to providing emergency services prior to, during, and following a hazard event.

Plan of Conservation and Development (2002)

The *Plan of Conservation and Development* was adopted in 2002 with contributions from local boards and commissions, citizens, and citizen groups. The Plan did not consider the potential impacts of natural hazards, but did outline areas that could not be built upon due to natural features such as steep slopes (those exceeding 15%) that restrict development. The purpose of the Plan is to balance growth with maintaining the rural quality of life that citizens within the town embrace. Intensive development is encouraged in only the Fitchville, Gilman, and Salem Turnpike sections of town.

Zoning and Subdivision Regulations

The Zoning Regulations of the Town of Bozrah, Connecticut were last updated in 2011. The Bozrah Planning & Zoning Commission held a public hearing on May 12, 2011 to adopt the amendments to the Subdivision and Zoning regulations addressing the SFHA requirements associated with the DFIRM. The Zoning Regulation amendments were incorporated in Sections 10.8 and 16.2 of the regulations while the Subdivision Regulation amendments were incorporated in Sections 5.3.9 and 5.7.3 of the Subdivision regulations.

Inland Wetland and Watercourses Regulations

The Inland Wetlands and Watercourses Regulations in the Town of Bozrah require a permit for certain regulated activities that take place near or in a wetland or watercourse or that may impact a wetland or watercourse. These regulations build on the preventative flood mitigation provided by the Zoning regulations by preventing fill and sedimentation that could lead to increased flood stages.

2.6 Critical Facilities, Sheltering Capacity, and Evacuation

Bozrah considers several facilities to be critical to ensure that emergencies are addressed while day-to-day management of the town continues. Critical facilities are presented on figures throughout this annex and summarized in Table 2-1. No critical facilities are located within a Special Flood Hazard Area (SFHA). These facilities are described in more detail below.

TABLE 2-1
Critical Facilities

Facility	Address or Location	Emergency Power?	Shelter?	In SFHA?
Emergency Services				
Bozrah Volunteer Fire Company*	239 Fitchville Road	✓	✓	
Municipal				
Fields Memorial School (ARC shelter)	8 Bozrah Street	✓	✓	
Highway Department Garage	231 Fitchville Road	✓		
Other Infrastructure / Facilities				
Bozrah Moose Lodge 950 (alternate shelter)	115 Fitchville Road		✓	
Fitchville Residential Care Home	187 Fitchville Road			
Reliance House Substance Abuse Rehabilitation Home	36 Haughton Road			
Home for people with disabilities	Caroline Road			
Chicken Farms	Townwide			
Utilities				
Norwich Public Utilities Potable Water Facilities	Townwide			✓

*Emergency Operations Center (EOC)

Bozrah Volunteer Fire Company

Bozrah has one volunteer fire company on Fitchville Road that responds to fires and accidents. The fire station is also the town's EOC and is outfitted with standby power supply via a generator.

The Fire Company has a variety of equipment including an ambulance, a rescue pumper, a 65 foot rescue ladder, a special equipment rescue truck, a 300 gallon forestry truck, a traffic control pick-up truck, an Emergency Medical Service (EMS) SUV, and a 2,750 gallon tanker. The Fire Company is the primary agency involved with hazard mitigation through emergency services and public education.

Shelters

The main shelter in Bozrah is Fields Memorial School. The facility is staffed by the American Red Cross as needed and has a generator. Bozrah Moose Lodge 950 is a backup shelter. The second floor of the Fire Company, which was the primary shelter in the past, is now considered to be a second backup shelter. As stated earlier, the Fire Company has an emergency power supply.

Communications

The town's communication capability is adequate for most circumstances. Emergency communications are good except during long power outages. Communication with Bozrah Light & Power (BL&P), a fully-owned subsidiary of Groton Utilities, was efficient following Tropical

Storm Irene and Winter Storm Alfred in 2011. Power was lost for two days following Tropical Storm Irene, but was restored quickly as a result of the efficient communication between BL&P, the Fire Company, and Public Works.

The town may pursue registering to the CT Alert "Everbridge" Emergency Notification System for Reverse 9-1-1. Upon registration, the town should encourage residents to sign up for the service via the CT Alert Emergency Notification System web site (http://www.ct.gov/ctalert/site/default.asp).

Additional Facilities

The town's Highway garage is located next to the Fire Company and is considered a critical facility.

The Fitchville Residential Care Home is a state-supported assisted care facility located on Fitchville Road and is also designated a Bozrah critical facility. Reliance House, located at 36 Haughton Road next to the temporary Town Hall is considered a critical facility as it is a substance abuse rehabilitation home that requires response from the Fire Company and is a significant draw on town resources. A home for people with disabilities is located on Caroline Road and is considered a critical facility.

Lastly, water facilities (including the Norwich Public Utilities transmission pipeline) that are located throughout town and chicken farms (the largest group of taxpayers) with multiple locations are both considered critical facilities.

Evacuation Routes

Annex E of Bozrah's EOP describes the town's evacuation plans. Section V, Part A entitled "Administration" states that the Evacuation Coordinator is responsible for maintaining up-to-date evacuation route maps which depict designated primary and alternate evacuation routes.

The highest capacity egress routes from Bozrah include Fitchville Road (Route 608) which runs parallel with Route 2 across northern Bozrah. Both roadways stretch from Lebanon at the west to Norwich at the east. Stretching west to east near the town line with Montville, South Road extends from Salem at the west to Route 82 in the southeastern corner town. At the South Road/Route 82 intersection, Route 82 extends to the east into Norwich. The main north-south egress route in Bozrah is that extends from the Montville town line to Route 608 is Route 163. From there, the most logical and highest capacity roadway to the town's border with Franklin to the north is Brush Hill Road.

2.7 Status of 2005 Plan Recommendations

The previous HMP included several general recommendations related to mitigating hazards. The recommendations and a summary of actions taken over the past several years towards those actions are listed below. Where progress was indicated, the progress was paid for out of the Town's operating budget.

- Complete Catch Basin Surveys to Identify Catch Basins in Need of Maintenance and/or Replacement & Complete Culvert Survey to Determine Priority for Maintenance and/or Replacement Plan (Yantic River & Tributaries) – Catch basin and surveys are completed annually by the Public Works. Replacement and maintenance is performed on the town's drainage system as funding allows on an annual basis. *This recommendation will not be pursued further.*

- Evaluate the Hazard Resistant Nature of Critical Facilities – This is ongoing as part of the town's annual EOP update. No critical facilities are believed to be more or less susceptible to natural hazards. *This recommendation remains valid but has been deferred to the EOP update.*

- Comprehensive Evaluation of Emergency Communication Capabilities Throughout the Town – This is ongoing along with the annual EOP update. The town is going to seek funding to join the CT Alert "Everbridge" Emergency Notification System for Reverse 9-1-1 capabilities. *This recommendation remains valid.*

- Develop a Flood Audit Program – At present, the town rarely suffers from flooding. Bozrah is aware of the limited problem areas and floodplain development regulations restrict additional development within them. *This recommendation will not be pursued further.*

- Review of Transportation Facilities to Identify Critical Risks – This is ongoing annually as part of the EOP update. The town had access issues during Hurricane Irene due to the many downed trees and power lines. *This recommendation remains valid but has been deferred to the EOP update.*

- Identify Appropriate Improvements to Traffic Infrastructure and Emergency Response Training and Equipment – This is ongoing as part of Fire Department training as well as the annual EOP update. The town has access to CERRIT, the regional hazardous response team. *This recommendation is not pursued further.*

- Implement a Reverse 9-1-1 System to Automatically Call Telephones Throughout Town, Relaying Important Information During an Emergency – The town will seek funding to join the CT Alert "Everbridge" Emergency Notification System for Reverse 9-1-1 capabilities to receive statewide notices and will work to implement the programming of specific areas. *This recommendation remains valid.*

- Distribute or Post Public Information Regarding Hazards in the Town – Notifications are posted on bulletin boards around town and at Town Hall. Local media is utilized to pass information prior to and during storms, including newspaper, television, and radio. *This recommendation remains valid and there are additional opportunities such as visiting residents and businesses following an event to update them on road conditions and available services, providing brochures at the Town Hall and posting of preparedness information on the town's web site.*

- Evaluate Emergency Shelters, Update Supplies, and Check Communication Equipment – This is conducted at least annually or following any use of the facilities. *This recommendation remains valid.*

- Maintain Emergency Personnel Training as Well as Maintaining and Updating Emergency Equipment and Response Protocols – Training is performed regularly, with equipment upgrades occurring to the extent the budget will allow. *This recommendation remains valid.*

- Evaluate and Consider Burying Power Lines Underground and Away from Possible Tree Damage – Utilities are not required to be underground. There are no areas with underground utilities except for Rachel Lane. There are no plans to move existing utilities underground. Much of the time, a limiting factor is the bedrock depth. *This recommendation remains valid for future developments where bedrock depths allow. The town should consider a requirement being placed into an ordinance for new development or substantial redevelopment where feasible.*

- Complete an Earthquake Survey of all Critical Facilities and Infrastructures –A formal survey is not proposed due to the infrequent nature of this hazard. Most town buildings are relatively old and likely do not have any seismic protection. *This recommendation will not be pursued further.*

- Complete a Survey of Fire Hydrants to Assess Vulnerabilities and Capabilities for Fire Protection – Fire protection capabilities are reviewed at least annually with the EOP update. The town believes that its fire protection level is adequate. NPU has hydrants in the area of town that it serves and a series of fire ponds and other water bodies used for fire suppression are available throughout town. *This recommendation remains valid.*

3.0 INLAND FLOODING

3.1 Setting/Historic Record

Flooding is the primary hazard that impacts the town each year as documented in the previous HMP. While riverine flooding is of primary concern, nuisance flooding and poor drainage are also issues at several locations in the town. Flooding is typically caused by heavy rainstorms, but can also be caused by relatively light rains falling on frozen ground. Flooding of roadways is more common than damage to structures.

The March 2010 storms produced the most widespread flooding in Bozrah since the last HMP, causing some roadway flooding and a significant amount of nuisance flooding as noted below. Structures in one area were directly affected by overbank flooding.

- The Yantic River rose to the level of Stockhouse Road in the northeast section of town, but did not submerge or cross the road. Businesses in this area are located at high points and therefore did not flood. This section of Stockhouse Road is part of a SFHA.

- Low-lying sections of Route 163 historically experience nuisance flooding due to poor drainage. This happens at the intersection of Caroline Road. This area is adjacent to Gardner Brook which flows from Gardner Lake to the Yantic River in this area.

- During the March 2010 storms, the area of Old Salem Turnpike near the Norwich city line experienced backed up water which accumulated three to four feet of water in basements in homes with walk-out basements. This was the result of an insufficient culvert capacity. In this area, small streams from Wawecus Hill flow southerly to this area.

3.2 Existing Programs, Policies, and Regulations

The town attempts to mitigate inland flood damage and flood hazards by utilizing a wide range of measures including restricting activities in floodprone areas, replacing bridges and culverts, promoting flood insurance, maintaining drainage systems, through education and outreach, and by utilizing warning systems. Many mitigation measures are common to all hazards and therefore were listed in Section 2.6. No structural flood control projects are located within or upstream of Bozrah, although the existing dams provide a small amount of flood mitigation.

Bridge Replacements, Drainage, and Maintenance

The Department of Public Works cleans and inspects catch basins and culverts at least annually or more often if problems are noted. When flooding occurs, the First Selectman (as Public Works Director) or the Fire Department typically handles complaints from residents. For example, public works would inspect bridges and culverts and erect barricades to close roads, while the Fire Department responds to calls requesting help for flooded basements. Drainage complaints are directed to the First Selectman. The Town has an active program for replacing / resizing road culverts and has a yearly line item in the budget for this purpose.

Regulations, Codes, and Ordinances

Bozrah has planning and zoning tools in place that incorporate floodplain management. The town also has subdivision regulations that require adequate drainage be provided to reduce exposure to flood hazards. Regulations covering development in and/or near inland wetland areas also exist.

Acquisitions, Elevations, and Property Protection

Bozrah has not performed acquisitions or elevations of floodprone property. Property protection has focused instead on preventive measures and maintaining and upgrading drainage systems.

Flood Watches and Warnings

The First Selectman and the Fire Department access weather reports through the National Weather Service and local media. The town does not yet participate in the CT Alerts "Everbridge" Reverse 9-1-1 System. Employment of this service would allow the town the ability to receive geographically specific weather warnings when storms are imminent. As a result, Bozrah does not currently have the capability to telephone warnings into specific areas.

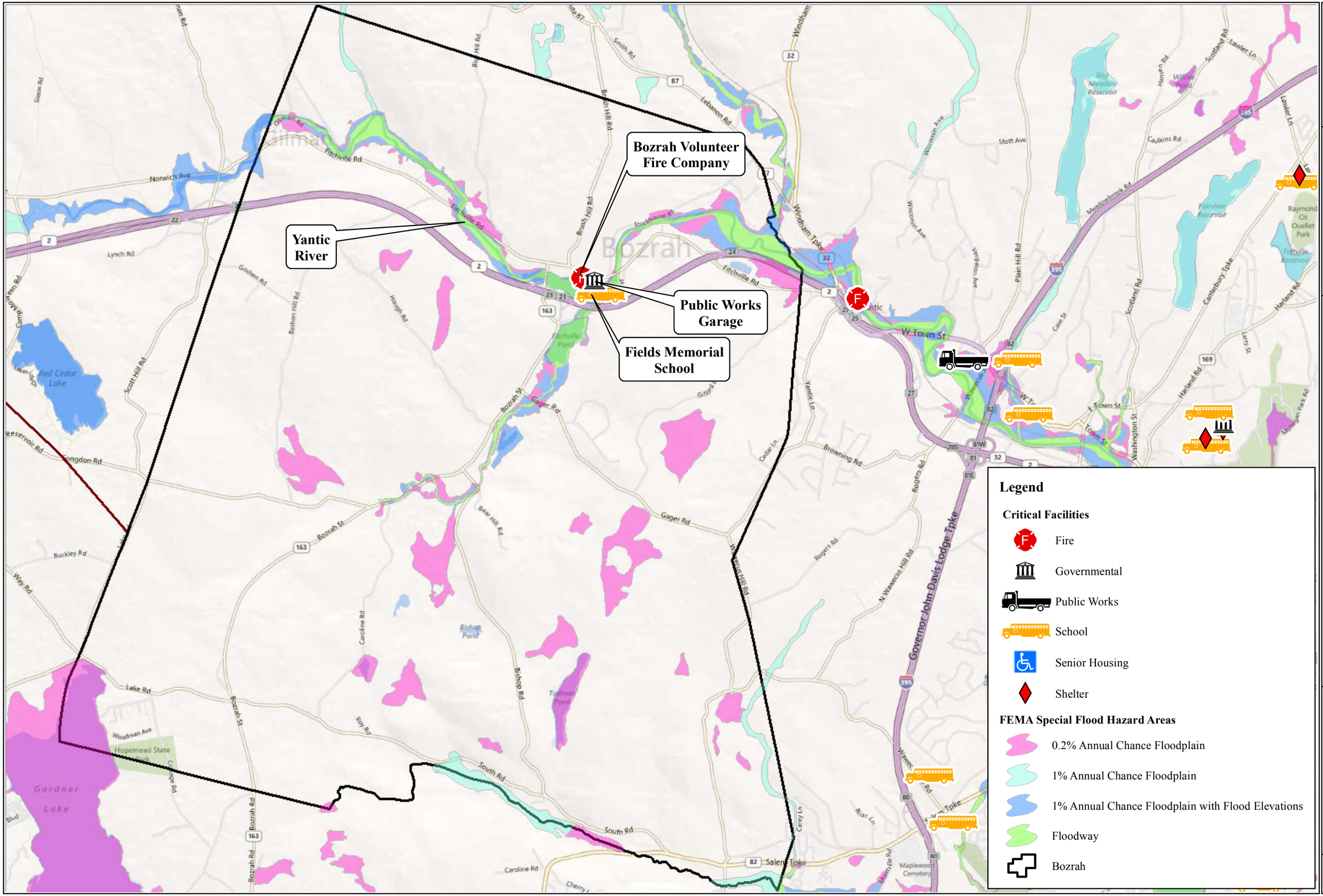
3.3 Vulnerabilities and Risk Assessment

This section discusses specific areas at risk to inland flooding within Bozrah. Inland flooding due to nuisance flooding or poor drainage is most common type of flooding experienced by the town, although roadway inundation also occurs during more severe events.

3.3.1 Vulnerability Analysis of Areas Along Watercourses

Two major inland watercourses and in Bozrah have the SFHAs defined by FEMA. These are the Yantic River and Gardner Brook which both are mapped as Zone AE, indicating that flood elevations are available. Additional mapped floodplains are Zone A. As previously discussed, there are a few areas of town that flooding is hazardous to residents, buildings, or roadways. Those areas are discussed in Section 3.1. Refer to Figure 3-1 for the location of SFHAs within Bozrah.

Major transportation routes in Bozrah include Fitchville Road (Route 608), Route 2, South Road / Route 82, and Route 163 / Brush Hill Road. In addition to the stretch of Route 163 described in Section 3.1 above, the DFIRM mapping suggests that these routes can be affected by extreme flooding. The DFIRM mapping shows FEMA flood zones stretching across at least one section of each route of egress listed above. According to town officials, likely the most problematic area of flooding associated with transportation through town is the section of Route 163 described in Section 3.1.



Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

SOURCE(S):
Town of Bozrah, FEMA, Microsoft (basemap)

FEMA Special Flood Hazard Areas

SCCOG HMP Update
Town of Bozrah Annex

Bozrah, Connecticut

Map By: SMG
MMI#: 3570-05
MXD: H:\3570-05\GIS\Maps\Bozrah\Figure3-1.mxd
1st Version: 7/7/2012
Revision: 7/11/2012
Scale: 1 in = 3,000 ft

Figure 3-1

3.3.2 Vulnerability Analysis of Private Properties

As noted in Table 3-4 of the Multi-Jurisdictional HMP, a total of 13 structures in Bozrah appear to be located in an SFHA floodplain. Most are located along the Yantic River with the majority of structures being residential and only a few commercial. Three structures appears to be located within the Zone A floodplain (the SFHA floodplain without flood elevations defined), while the remaining ten appear to be located either within Zone AE or the floodway in Zone AE.

Town personnel indicate that structures typically do not get flooded via overbanking, but structures in the Old Salem Turnpike area described in Section 3.1 experienced basement flooding during the flood event of March 2010. The Town believes that a culvert replacement on Old Salem Turnpike would help to mitigate the basement flooding, but it would be an expensive project and the Town does not currently have the funding to perform the replacement.

As shown in Table 3-5 of the Multi-Jurisdictional HMP, there are no repetitive loss properties in town. Such properties are those which have received two or more claim payments of more than $1,000 from the NFIP with any rolling 10-year period for the home or business. Largely, flooding of private properties is an issue related to insufficient drainage systems.

3.3.3 Vulnerability Analysis of Critical Facilities

As noted in Section 2.6, only components of the Norwich Public Utilities potable water system in Bozrah are located within an SFHA flood zone. In respect to critical facilities, there are no serious concerns to the town in conjunction with flooding.

3.4 Potential Mitigation Measures, Strategies, and Alternatives

Potential mitigation measures for reducing or eliminating the impact of inland flooding fall into the categories of prevention, property protection, emergency services, public education and awareness, natural resource protection, and structural projects. General potential mitigation measures that can be taken to reduce the effects of inland flooding were discussed in Section 3.7 and in Section 11.2.2 of the Multi-Jurisdictional HMP. General recommendations pertinent to all natural hazards that could affect the town are listed in Section 11 of this annex, as are specific measures pertinent to reducing inland flooding in the Bozrah.

4.0 COASTAL FLOODING

4.1 Setting/Historic Record

Bozrah is not located along the coastline nor is it located in a potential hurricane surge zone. As such, no coastal flooding or storm surge has affected the town since the last HMP. Therefore, the town is not considered to be affected by coastal flooding and storm surge.

4.2 Existing Programs, Policies, and Regulations

Due to the town not being on the coast, it does not have and/or need regulations to restrict development due to coastal flooding hazards.

4.3 Vulnerabilities and Risk Assessment

No areas of the town are vulnerable to coastal flooding or storm surge.

4.4 Potential Mitigation Measures, Strategies, and Alternatives

No mitigation measures for reducing the impact of coastal flooding or storm surge in the town are necessary or are proposed.

5.0 HURRICANES AND TROPICAL STORMS

5.1 Setting/Historic Record

Several types of hazards may be associated with tropical storms and hurricanes including heavy or tornado winds, heavy rains, and flooding. Flooding hazards are discussed in Section 3 of this annex. Wind hazards are widespread and can affect any part of the town. However, some buildings in the town are more susceptible to wind damage than others.

The last major hurricane or tropical storm wind event to affect the town was associated with Tropical Storm Irene in August 2011. Sections of and entire trees fell throughout the town and the region causing power outages lasted up to two days in Bozrah. Bozrah Light & Power (BL&P) worked closely with the Fire and Public Works Departments to clear roadways throughout town. According to the First Selectman, town shelters were not needed following Tropical Storm Irene.

5.2 Existing Programs, Policies, and Mitigation Measures

Wind loading requirements for new buildings are addressed through the Connecticut Building Code which is utilized by the town. Effective December 31, 2005, the design wind speed for the Bozrah is 110 miles per hour. The Town does not have a specific requirement requiring that utilities be located underground in new developments; however a new roadway intended to spur commercial and industrial development, Rachel Drive, has underground utilities.

Parts of trees (limbs) or entire tall and older trees may fall during heavy wind events, potentially damaging structures, utility lines, and vehicles. Utility lines are located underground in only a couple areas of the town. The First Selectman is the Tree Warden who can post notification and schedule tree removal. As mentioned previously when discussing the effectiveness of clean-up following Tropical Storm Irene, the town works efficiently with BL&P. BL&P works with residents to remove trees that threaten their lines, while the Tree Warden works with property owners primarily on hazardous trees and limbs. The town is equipped with a bucket truck that is used for tree removal. If needed, the town utilizes the services of a contractor.

Warning is one of the best ways to prevent damage from hurricanes and tropical storms, as these storms often are tracked well in advance of reaching Connecticut. The town can access National Weather Service forecasts via the internet as well as listening to local media outlets (television, radio) to receive information about the relative strength of the approaching storm. This information provides the resources needed to determine whether or not to activate its EOP and encourage residents to take protective or evacuation measures if appropriate.

Once implemented, residents will be able to sign up to receive warnings from the statewide CT Alert "Everbridge" Emergency Notification System to receive critical information and the town will have the ability to send area specific alerts. Although hurricanes that have impacted Bozrah have historically passed in a day's time, additional regional shelters could be outfitted following a storm with the assistance of the American Red Cross on an as-needed basis for long-term evacuees.

5.3 Vulnerabilities and Risk Assessment

The entire town is vulnerable to hurricane and tropical storm wind damage and from any tornadoes (Section 6) accompanying the storm, as well as inland flooding (Section 3). Of particular concern are the blockage of roads and the damage to the electrical power supply from falling trees and tree limbs. There was a town-wide two day power outage following due to tree damage to utility lines following Hurricane Irene in 2011.

Many of the structures built in town do not meet current building codes and are particularly susceptible to roof and window damage during high wind events. Those newer structures put in place since the 1990s are less vulnerable to damage from hurricanes and/or tropical storms. This risk to structures will be reduced with time as these buildings are remodeled or replaced with buildings that meet current codes. The Town is currently working on upgrading municipal buildings as funding allows. For example, the Town Hall has been recently rehabilitated and renovated to meet all current building codes.

The strength of a large hurricane could cause a moderate economic impact to the town. The potential economic effect of wind damage to SCCOG was evaluated in the Multi-Jurisdictional HMP. A separate analysis was not performed specifically for Bozrah.

5.4 Potential Mitigation Measures, Strategies, and Alternatives

Potential mitigation measures for reducing or eliminating the impact of wind damage fall into the categories of prevention, property protection, emergency services, public education and awareness, natural resource protection, and structural projects. General potential mitigation measures that can be taken to reduce the effects of wind damage from hurricanes and tropical storms were discussed in Section 5.7 and in Section 11.2.3 of the Multi-Jurisdictional HMP. General recommendations pertinent to all natural hazards that could affect the town are listed in Section 11 of this annex, as are specific measures pertinent to reducing wind damage to Bozrah.

6.0 SUMMER STORMS AND TORNADOES

6.1 Setting/Historic Record

Similar to hurricanes and winter storms, wind damage associated with summer storms and tornadoes has the potential to affect any area of Bozrah. Furthermore, 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. Such storms occur in the town each year, although hail and direct lightning strikes to the town are rarer. No tornadoes have occurred in the town since the last HMP.

6.2 Vulnerabilities and Risk Assessment

Warning is the most viable and therefore 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. The town can access National Weather Service forecasts via the internet as well as listen to local media outlets (television, radio) to receive information about the relative strength of the approaching storm. This information allows the town to activate its EOP and encourage residents to take protective measures if appropriate.

Aside from warnings, additional methods of mitigation for wind damage are employed by the town as explained in Section 5.2 within the context of hurricanes and tropical storms. In addition, the Connecticut Building Code includes guidelines for the proper grounding of buildings and electrical boxes to protect against lightning damage.

6.3 Emergency Response Capabilities

Summer storms are expected to occur each year and are expected to at times produce heavy winds, heavy rainfall, lightning, and hail. All areas of the town are equally likely to experience the effects of summer storms. The density of damage is expected to be greater near the more densely populated area of the town.

Most thunderstorm damage is caused by straight-line winds exceeding 100 mph. Experience has generally shown that wind in excess of 50 miles per hour (mph) will cause significant tree damage during the summer season as the effects of wind on trees is exacerbated when the trees are in full leaf. The damage to buildings and overhead utilities due to downed trees has historically been the biggest problem associated with wind storms. 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. Fortunately, most fires are quickly extinguished due to the town's strong fire response and coordination with Connecticut DEEP fire fighters.

Lightning and hail are generally associated with severe thunderstorms and can produce damaging effects. All areas of the town are equally susceptible to damage from lightning and hail, although lightning damage is typically mitigated by warnings and proper grounding of buildings and equipment. Hail is primarily mitigated by warning, although vehicles and watercraft can often not be secured prior to the relatively sudden onset of a hailstorm. Lightning and hail are considered likely events each year, but typically cause limited damage in the town. Older

buildings are most susceptible to lightning and hail damage since many were constructed prior to current building codes, and many campgrounds offer little structural protection from the elements.

Although tornadoes pose a threat to all areas of Connecticut, their occurrence is least frequent in New London County as compared with the rest of the Connecticut. Thus, while the possibility of a tornado striking the town exists, it is considered to be an event with a very low probability of occurrence.

6.4 Vulnerabilities and Risk Assessment

General potential mitigation measures that can be taken to reduce the effects of wind damage were discussed in Section 5.7 and in Section 11.2.3 of the Multi-Jurisdictional HMP. No additional recommendations are available specific to reducing damage from summer storms and tornadoes. Refer to Section 11 of this annex for recommendations related to wind damage and general recommendations related to emergency services in Bozrah.

7.0 WINTER STORMS AND NOR'EASTERS

7.1 Setting/Historic Record

Similar to hurricanes and summer storms, winter storms have the potential to affect any area of the town. However, unlike summer storms, winter storms and the hazards that result (wind, snow, and ice) have more widespread geographic extent. In general, winter storms are considered highly likely to occur each year (major storms are less frequent), and the hazards that result (nor'easter winds, snow, and blizzard conditions) can potentially have a significant effect over a large area of the town.

Winter storms and nor'easters have affected the town since the last HMP as reported to the NCDC and reported by town officials. However, only the winter storms of 2010-2011 had a significant effect on the town during this period of time. The winter of 2010-2011 produced significant snowfall in Bozrah. However, roof damage was not observed. Concern for the school resulted in an inspection by the town's engineer. The town eventually cleared the roof because more snow was in forecast. Winter Storm Alfred in late October 2011 caused only minor tree damage and no loss of power in town.

7.2 Existing Programs, Policies, and Mitigation Measures

Existing programs applicable to winter storm winds are the same as those discussed in Sections 5.2 and 6.2. Programs that are specific to winter storms are generally those related to preparing plows and sand and salt trucks; tree trimming and maintenance to protect power lines, roads, and structures; and other associated snow removal and response preparations.

As it is almost guaranteed that winter storms will occur annually in Connecticut, it is important to locally budget fiscal resources toward snow management. Snow is the most common natural hazard requiring additional overtime effort from town staff, as parking lots and roadways need constant maintenance during storms.

The Public Works Department oversees snow removal in the town. The Connecticut Department of Transportation (DOT) plows the State roadways, while the town plows approximately 36 miles of roads by employing four trucks and five crews. The First Selectman is responsible for conducting reconnaissance work prior to dispatching plow crews. The First Selectman is also responsible to advise the superintendent of schools whether a delay or closure is necessary. Public Works Department crews are usually plowing by 4 a.m. and a high priority is given to school bus routes that include steep hills.

The Connecticut Building Code specifies that a pressure of 30 pounds per square foot be used as the base "ground snow load" for computing snow loading for roofs. The town monitors and shovels the roofs of municipal buildings when snow loads accumulate, and many residents and businesses shovel or plow their roofs.

7.3 Vulnerabilities and Risk Assessment

Severe winter storms can produce an array of hazardous weather conditions, including heavy snow, microclimates, blizzards, freezing rain and ice pellets, flooding, heavy winds, and extreme

cold. Further "flood" damage could be caused by flooding from frozen water pipes. Often, tree limbs on roadways are not suited to withstand high wind and snow or ice loads.

Warning and education can prevent most injuries from winter storms. Most deaths from winter storms are indirectly related to the storm, such as from traffic accidents on icy roads and hypothermia from prolonged exposure to cold. Damage to trees and tree limbs and the resultant downing of utility cables are a common effect of these types of events. Secondary effects can include loss of power and heat.

As a result of a significant change in elevation in town with elevations ranging from approximately 110 feet to approximately 540 feet, town officials report that microclimates exist in Bozrah. According to the First Selectman there are three or four in town and they present area-specific problems in town. Snowfall amounts can vary significantly in Bozrah dependent on elevation.

There are several areas with steep slopes in Bozrah such that extra sanding and salting of the roadways is necessary in many areas to alleviate trouble spots. Town officials did not indicate this to be a major issue but rather an issue that deserves priority when town staff begin their treatment of roads. These areas are usually treated first by town staff during and following winter storms. Also, there are no issues with ice jams on any of the streams in the town.

7.4 Potential Mitigation Measures, Strategies, and Alternatives

Potential mitigation measures for flooding caused by nor'easters include those appropriate for flooding that were discussed in Section 3.7 of the Multi-Jurisdictional HMP and Section 11 of this annex. However, winter storm mitigation measures must also address blizzards, snow, and ice hazards. General potential mitigation measures that can be taken to reduce the effects of wind damage were discussed in Section 5.7 and in Section 11.2.3 of the Multi-Jurisdictional HMP and Section 11 of this annex.

8.0 EARTHQUAKES

8.1 Setting/Historic Record

An earthquake is a sudden rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse; disrupt gas, electric, and telephone lines; and often cause landslides, flash floods, fires, avalanches, and tsunamis. Earthquakes can occur at any time and often without warning. Detailed descriptions of earthquakes, scales, and effects can be found in Section 8 of the Multi-Jurisdictional HMP. Despite the low probability of an earthquake occurrence, earthquake damage presents a potentially catastrophic hazard to the town. However, it is very unlikely that the town would be at the epicenter of such a damaging earthquake. No major earthquakes have affected the town since the last HMP.

8.2 Existing Programs, Policies, and Mitigation Measures

The Connecticut Building Codes include design criteria for buildings specific to each region as adopted by Building Officials and Code Administrators (BOCA). These include the seismic coefficients for building design in Bozrah. The town has adopted these codes for new construction, and they are enforced by the Zoning Enforcement Officer.

Due to the infrequent nature of damaging earthquakes, town land use policies do not directly address earthquake hazards. However, the potential for an earthquake and emergency response procedures is addressed in the town's EOP.

8.3 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. As noted in Section 2.1, areas along the Yantic River and its tributaries are underlain by stratified drift. These areas are likely more at risk for earthquake damage than the areas of the town underlain by glacial till. The best mitigation for future development in areas of sandy material is the application of the most stringent standards in the Connecticut Building Code, exceeding the building code requirements, or, if the town deems necessary, the possible prohibition of new construction. Those areas not at increased risk during an earthquake due to unstable soils are the areas underlain by glacial till.

Two bedrock faults that are oriented east-west near the town line with Montville pinch the formations into east-west and v-orientations in the south-southeastern section of town. Unlike seismic activity in California, earthquakes in Connecticut are not associated with specific known active faults. However, bedrock in Connecticut and New England in general is typically formed from relatively hard metamorphic rock that is highly capable of transmitting seismic energy over great distances. For example, the relatively strong earthquake that occurred recently in Virginia was felt in Connecticut because the energy was transmitted over a great distance through such hard bedrock.

The built environment in the town primarily includes some more recent construction that is seismically designed. However, most buildings were built before the 1990s and therefore are not built to current building codes. In addition, there are areas such as town parks with recreational

buildings or shelters that may not be seismically designed. Thus, it is believed that most buildings would be at least moderately damaged by a significant earthquake. Those town residents who live or work in older, non-reinforced masonry buildings are at the highest risk for experiencing earthquake damage.

Areas of steep slopes can collapse during an earthquake, creating landslides. Bozrah has areas of steep slopes and bluffs although the majority of these features occur in undeveloped areas. Thus, landslides are not a concern in the town.

Seismic activity can also break utility lines such as water mains, gas 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 HMP, dam failure has been addressed separately in Section 10.0. As noted previously, most utility infrastructure in the town is located above ground. A quick and coordinated response with BL&P will be necessary to inspect damaged utilities following an earthquake, to isolate damaged areas, and to bring backup systems online. This is covered in the Bozrah and BL&P's EOPs.

A *HAZUS-MH* analysis of the potential economic and societal impacts to the SCCOG region from earthquake damage is detailed in the Multi-Jurisdictional HMP. The analysis addresses a range of potential impacts from any earthquake scenario, estimated damage to buildings by building type, potential damage to utilities and infrastructure, predicted sheltering requirements , estimated casualties, and total estimated losses and direct economic impact that may result from various earthquake scenarios.

8.4 Potential Mitigation Measures, Strategies, and Alternatives

Due to the low probability of occurrence, potential mitigation measures related to earthquake damage primarily include adherence to building codes and emergency response services. Both of these are mitigation measures common to all hazards as noted in Section 11 of this annex. The Multi-Jurisdictional HMP also includes additional recommendations for mitigating the effects of earthquakes that are also listed in Section 11.

9.0 WILDFIRES

9.1 Setting/Historic Record

Wildfires are considered to be highly destructive, uncontrollable fires. The most common causes of wildfires are arson, lightning strikes, and fires started from downed trees hitting electrical lines. Thus, wildfires have the potential to occur anywhere and at any time in both undeveloped and developed areas of Bozrah. Structural fires in higher density areas of the town are not directly addressed herein.

According to the First Selectman, no specific areas of wildfire risk or vulnerability are known. Small fires have historically occurred during dry spring weather. The Norwich Public Utilities has fire hydrants located in the sections of town which they serve, however most of the town lacks hydrants. That said, a series of water sources (surface water fire suppression sources) are located throughout time. Between the Bozrah Fire Department's tanker truck and several mutual aid agreements with neighboring towns, Bozrah believes their services are fully capable. Whenever water is needed for fire suppression, the tanker truck continuously moves to and from the nearest hydrant, or other water source, to maintain a constant water supply.

9.2 Existing Programs, Policies, and Mitigation Measures

Monitoring of potential fire conditions is an important part of mitigation. The Connecticut DEEP Forestry Division uses the rainfall data recorded by the Automated Flood Warning system to compile forest fire probability forecasts. This allows the DEEP to monitor drier areas to be prepared for forest fire conditions. The town can access this information over the internet. The town also receives "Red Flag" warnings via local media outlets.

Existing mitigation for wildland fire control is typically focused on building codes, public education, Fire Department training, and maintaining an adequate supply of equipment. The Fire Company has a variety of equipment including a 300 gallon forestry truck. The Fire Department also has mutual aid agreements with surrounding communities.

The Fire Department goes to fires as quickly as possible in the town. Fire protection water is obtained through the hydrants and water surfaces previously mentioned. In areas located far from the dry hydrant, they draft water from the various streams, ponds, and rivers in the town, and rely on pump trucks to carry water to distant areas. The amount of fire protection afforded by the dry hydrants and nearby streams is considered to be adequate for the development level of Bozrah. The Volunteer Fire Company will continue to evaluate the level of risk and the need for additional hydrants as development continues in the future.

9.3 Emergency Response Capabilities

Forests and inaccessible tracks of land are at the highest risk for wildfires. However, according to the First Selectman, there are no specific areas of wildfire risk or vulnerability in Bozrah. Refer to Figure 9-1 in the Multi-Jurisdictional HMP for a general depiction of wildfire risk areas region-wide.

9.4 Vulnerabilities and Risk Assessment

The Town of Bozrah is a low -risk area for wildfires. Potential mitigation measures for wildfires include a combination of prevention, education, and emergency planning measures as presented in Section 11.

10.0 DAM FAILURE

10.1 Setting/Historic Record

Dam failures can be triggered suddenly with little or no warning and often in connection with natural disasters such as floods and earthquakes. Dam failures can occur during flooding when the dam breaks under the additional force of floodwaters. In addition, a dam failure can cause a chain reaction where the sudden release of floodwaters causes the next dam downstream to fail. While flooding from a dam failure generally has a limited geographic extent, the effects are potentially catastrophic depending on the downstream population. A dam failure affecting Bozrah is considered a possible event each year with potentially critical effects. No dam failures affected the town since the time of the last HMP.

10.2 Regulations, Codes, and Ordinances

The Connecticut DEEP administers the Dam Safety Section and designates a classification to each state-registered dam based on its potential hazard as detailed in the regional plan. As noted in the Multi-Jurisdictional HMP, Bozrah is home to one Class C (high hazard) dam and one Class B (significant hazard) dam. These dams are listed on Table 10-1. No Class B or Class C dams are located upstream of Bozrah whose failure could potentially lead to flooding within the town.

TABLE 10-1
Dams Registered With the DEEP in the Town of Bozrah

Number	Name	Owner	Class
1302	Fitchville Pond Dam	Private (Commercial)	C
1305	Gardner Lake Dam	CT DEEP	B

Dams in the region whose failure could impact Bozrah are under the jurisdiction of the Connecticut DEEP. The dam safety statutes are codified in Section 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, which govern the registration, classification, and inspection of dams. Dams must be registered by the owner with the DEEP according to Connecticut Public Act 83-38.

Owners of high and significant hazard dams are required to maintain EOPs for such dams. The Town of Bozrah does not own any dams. An out-of-date EOP for the Fitchville Pond Dam and an inundation map for the Gardner Lake Dam were available in the files at the CT DEEP. The town should work with the DEEP and dam owners to ensure that EOPs remain current and on file. For specific information on both dams, see Section 10.3 below.

10.3 Vulnerabilities and Risk Assessment

The potential impacts related to the failure of Class C and Class B dams within Bozrah are described below. Where information was available, the descriptions below are based on information available at the Connecticut DEEP Dam Safety Section. Refer to Figure 10-1 for a location map showing the dams and potential dam failure inundation areas (where available).

Fitchville Pond Dam (Class C)

Gardner Lake Dam (Class B)

LEBANON
BOZRAH
COLCHESTER
SALEM
MONTVILLE
NORWICH

Legend

Dam Failure Inundation Area

- Fitchville Pond Dam
- Gardner Lake Dam
- Bozrah

Dam Hazard Classification

- BB, A, AA or Unranked
- B
- C

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SOURCE(S):
USGS, CT DEEP , Town of Bozrah

Dam Failure Inundation Area Mapping

SCCOG HMP Update
Town of Bozrah Annex

Bozrah, Connecticut

Map By: SMG
MM#: 3570-05
MXD: H:\3570-05\GIS\Maps\Bozrah\Figure10-1.mxd
1st Version: 6/27/2012
Revision: 7/12/2012
Scale: 1 in = 3,500 ft

Figure 10-1

- *Fitchville Pond Dam* – Fitchville Pond is a Class C dam located at the northeast end of Fitchville Pond that forms an impoundment of the Yantic River. The structure is located 500 feet south of the Route 163/Route 2 intersection. According to the 1979 USACE Inspection Report, the dam is a stone masonry/concrete gravity structure constructed in 1871 for recreation and process water for the Palmer Brothers Company mill complex. The original dam was a masonry-timber structure with earthen embankments. It was modified in 1914, when a concrete overflow spillway was constructed and outlet gates and adjacent walls were reconstructed. The dam has a height of 27 feet and length of 200 feet. The 108-foot spillway is an uncontrolled ogee overflow located in the right two-thirds of the dam. Three manually operated sluice gates comprise the outlet works which discharges flows to a wasteway at the left abutment. A nine-foot diameter corrugated metal penstock which led to the mill complex has been blocked.

  The pond has a width of 1,800 feet, a length of 7,200 feet, and a surface area of 487 acres. The drainage area to the lake is approximately 68.5 square miles, and the impoundment capacity is 759 acre-feet. Water flowing over the spillway passes beneath the Fitchville Road (State Route 608) bridge located over the Yantic River. Although the USACE standards describe the structure as small, it is a significant hazard dam. The test flood outflow is one-half the PMF (30,000 cfs), which would overtop the structure by 11 feet. The spillway capacity is only enough for 24% of the test flood outflow. Estimated water depth at failure (9,620 cfs) is 17 feet at the dam and 12 feet at a location 10,000 feet downstream of the dam. Failure of the structure could cause damage due to high velocity, impact from debris and flooding to homes, commercial properties, roadways (specifically Route 2), and utilities (telephone and power lines at Route 2). Immediately below the dam, the 30-inch water supply line for the City of Norwich crosses the river on its own bridge support.

  An inspection by the state in May 1963 noted that the structure was unsafe, and repairs were completed in 1964. A July 1972 inspection by Buck & Buck Engineers noted leakage at the penstock inlet to the mill, and repairs were completed in April 1973. In April 1974, the existing penstock was sealed and the downstream stone retaining wall on the south side was repaired. In 1978, the state reconstructed the highway bridge below the dam. The 1979 USACE inspection noted that the structure was in fair condition and recommended repairs and further study. In August 1990 a report was issued by Cummings & Lafayette which investigated the dam and repairs to the structure. The report included a dam failure analysis and map of inundation should the structure fail. This map was based on the one-half PMF and notes that the spillway would be overtopped by 9.8 feet and Route 2 would be overtopped by 5.7 feet. The report identified several problem areas leading to a rating of poor condition. As of July 2002, the CT DEEP was reviewing plans that included installation of shotcrete and a proposed gatehouse, along with continued discussions on the transfer of ownership.

- *Gardner Lake Dam* – Gardner Lake Dam is a Class B dam located at the northern end of Gardner Lake, at the southwest corner of the town, approximately 4.9 miles upstream of Gardner Brook confluence with the Yantic River. The dam is owned by the CT DEEP. The drainage area to the lake is approximately 5.63 square miles, and the lake itself has a maximum storage capacity of 3,270 acre-feet. The lake is 9,400 feet in length and has a surface area of 521 acres. The structure is a low spillage-low surcharge dam used to impound a recreational lake. According to the 1979 USACE Inspection Report, the dam is an earthen embankment structure with a shallow concrete wall that extends across the full length of the

upstream face. The structure is classified as intermediate in size and a significant hazard. The top of the dam is approximately 9.6 feet above the streambed of Gardner Brook. The top of the dam is approximately 168 feet long along the upstream edge of the crest and ranges in width from 72 feet to 154 feet. Lake Road passes over the crest near the downstream face of the dam. The structure includes two concrete spillways: a service spillway located at the left abutment having a length of 11.5 feet, and an auxiliary spillway and outlet structure at the right abutment having a length of 12 feet. The outlet is controlled by a three-foot square sluice gate.

Failure of the structure may result in economic loss and a few lives. The PMF is 9,200 cfs and the test flood is one-half the PMF. The 1979 Phase I noted that a breach failure would release water down Gardner Brook to the Yantic River. Lake Road would be severed between the dam and Scott Hill Road (approximately two miles). Downstream of Scott Hill Road, it is not anticipated that there would be structure or property damage. Scott Hill Road itself would be flooded and one house on the east side would be damaged.

Reconstruction work was completed in 1969. The 1979 inspection noted that there was no evidence of seepage or slides. Emergency repairs were completed in 1983. Repair work on a void at the intersection of the two upstream concrete training walls was completed in February 1990. The gate stem and gate were repaired in 2006. Weed control operations and the associated drawdown were completed in October 2007. The Gardner Lake State Boat Launch area was also repaired in fall 2007.

10.4 Potential Mitigation Measures, Strategies, and Alternatives

Bozrah is considered a low-medium-risk area for dam failure since the majority of dams are well-maintained with active coordination with the Connecticut DEEP. Potential mitigation measures for dam failure include a combination of prevention, education, and emergency planning, as well as dam removal projects as discussed in Section 11.

11.0 RECOMMENDATIONS

11.1 Summary of Specific Recommendations

The Multi-Jurisdictional HMP provided several region-wide recommendations applicable to all hazards that are also pertinent to Bozrah. In addition, recommendations throughout the sections of this annex are also applicable as recommendations. These recommendations are listed below.

11.1.1 Recommendations Applicable to All Hazards

Regional Coordination

- Continue to promote inter-jurisdictional coordination efforts for emergency response.
- Continue to promote local and regional planning exercises that increase readiness to respond to disasters.
- Continue to evaluate communication capabilities and pursue upgrades to communication ensuring redundant layers of communication are in place within the town and with other SCCOG communities, New London County, and the State of Connecticut.
- Continue to promote regional transportation planning through SCCOG to balance general transportation, shipping, and potential evacuation needs.
- Work with SCCOG to perform a regional study to identify the vulnerability of critical facilities that may be unable to withstand natural hazard damage. Emphasis should be placed on critical infrastructure, shelters and other sites to ensure structural integrity against various hazards and adequacy of backup supplies.

Local Emergency Response

- Continue to review and update the town EOP at least once annually.
- Continue to maintain emergency response training and equipment and upgrade equipment when possible.
- Encourage local officials to attend FEMA-sponsored training seminars at the Emergency Management Institute (EMI) in Emmitsburg, Maryland. All of these workshops are free of charge. Tuition, travel and lodging are provided by FEMA for the EMI training. Annual training sessions include emergency management, environmental reviews, the FEMA grant programs, the NFIP and CRS and others related to other hazards.
- Continue to evaluate emergency shelters, update supplies, and check communication equipment.
- Pursue the American Red Cross-certification of the main shelter, Fields Memorial School, and the back-up shelters which include both Bozrah Moose Lodge 950 and the Volunteer Fire Company.

- Continue to promote dissemination of public information regarding natural hazard effects and mitigation measures into local governmental and community buildings. Specifically,

  - ⇨ Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series (http://www.ready.gov/are-you-ready-guide).

  - ⇨ Encourage residents to purchase NOAA weather radios with an alarm feature.

  - ⇨ Post hazard preparedness information on the town's website. Include links to established sources at the State of Connecticut and FEMA.

- Enroll the town in the CT Alert Emergency Notification System. Following enrollment, encourage town residents to register with the service through the CT Alert ENS website (http://www.ct.gov/ctalert/site/default.asp).

Prevention

- Develop a checklist for land development applicants that cross-references the specific regulations and codes related to disaster resilience.

- Integrate elements of this HMP into the *Plan of Conservation and Development* during the 2013 update and beyond.

- Consider requiring the underground installation of utilities for new development to the greatest extent/feasibility. Areas of shallow bedrock will likely be limiting.

- Continue reviewing building plans to ensure proper access for emergency vehicles.

- Continue to enforce the appropriate building code for new building projects.

- Encourage residents to install and maintain lightning rods on their buildings.

Natural Resource Protection & Open Space

- Continue to regulate development in protected and sensitive areas including steep slopes, wetlands, and floodplains.

11.1.2 Recommendations Applicable to Inland Flooding

Prevention

- Continue to regulate new development activities within SFHAs to the greatest extent possible within the local land use regulations.

- Require developers to demonstrate whether detention or retention of stormwater is the best option for reducing peak flows downstream.

- Conduct an annual inspection of floodprone areas that are accessible to town officials. Determine if potential flood damage is stormwater facility related and make recommendations as appropriate.

- Upgrade culverts along Old Salem Turnpike to reduce the frequency of flooding near Wawecus Hill.

Property Protection

- Incorporate information on the availability of flood insurance into all hazard-related public education workshops.

- Make available FEMA-provided flood insurance brochures at public accessible places such as the local government buildings. Encourage residents to purchase flood insurance if they are located within a FEMA SFHA.

- Provide technical assistance to owners of non-residential structures that suffer flood damage regarding floodproofing measures such as wet and dry floodproofing.

- Encourage residents to submit flood insurance claims following damage events.

Emergency Services

- Pursue mutual aid agreements with such organizations as the American Red Cross and the Boy Scouts of America to provide volunteer labor during flooding to assist with response activities.

Public Education and Awareness

- Conduct a "Natural Hazards Fair" so that interested parties can familiarize themselves with natural hazard mitigation options. Consider working different "hazard weeks" into public education plans when possible tying into national hazard weeks such as "Fire Prevention Week", "Hurricane Preparedness Week", and others.

- Visit schools (as is currently done under fire prevention) and educate children about the risks of floods (and other natural hazards) and how to prepare for them.

- Encourage builders, developers, and architects to become familiar with the NFIP land use and building standards by attending annual workshops.

Natural Resource Protection

- Pursue the acquisition of additional municipal open space in SFHAs.

- Continue to aggressively pursue wetlands protection through existing wetlands regulations. Incorporate performance standards into subdivision reviews to include additional protective measures such as conservation easement areas around wetlands and watercourses.

Structural Projects

- Utilize recently available extreme rainfall data to determine existing sizing of culverts. Encourage bridge replacements and culvert replacements in areas found to be undersized. Web sites such as http://precip.eas.cornell.edu/ publish this information.

- Continue to perform catch basin and culvert surveys to perform maintenance and cleaning and to identify and prioritize structures in need of replacement.

- Pursue funding for the installation of a new culvert in the area of Old Salem Turnpike near the Norwich city line where small streams from Wawecus Hill flow southerly to the area. The area experienced backed up water which accumulated three to four feet of water in basements in homes with walk-out basements during the heavy precipitation events of March 2010.

11.1.3 Recommendations Applicable to Wind Damage from Hurricanes, Tropical Storms, Summer Storms, Tornadoes, and Winter Storms

Prevention

- Encourage Bozrah Light & Power to also cut down trees as opposed to just trimming trees near power lines.

- Continue to perform appropriate tree maintenance to the greatest extent possible.

Property Protection

- Promote the use of functional shutters for older buildings in the town to guard against window breakage which can result in structural failure.

- The Building Official should make information on wind-resistant construction techniques (such as hurricane straps) available to all building permit applicants.

- Encourage commercial building owners to develop Emergency Response Plans and identify mitigation opportunities.

Emergency Services

- Identify a location or locations in the town for a brush disposal operation for dealing with debris after wind storms. Determine how these trees can be reused within the town (chips, firewood, composting) to reduce costs of exporting.

- Consider surveying all town-owned buildings to determine their ability to withstand wind loading, particularly shelters and schools. Such effort could be included in the regional critical facility study described in Section 2.8.

- Develop agreements, if necessary, with land owners and with companies to chop/chip in order to ensure that plans are in place prior to damage and cleanup needs (as is done for snow plow operations).

Public Education and Awareness

- Visit schools (as is currently done under fire prevention) and educate children about the risks of wind events (and other natural hazards) and how to prepare for them.

11.1.4 Recommendations Exclusively Applicable to Winter Storms

- Consider drafting a written plan for inspecting and prioritizing the removal of snow from town-owned structures.

- Continue making funding available to the Public Works Department each budget year for clearing snow from roads and parking lots.

- Provide information for generally protecting town residents during cold weather and for mitigating icing and insulating pipes at residences.

- Consider posting the snow plowing routes in Town Hall and on the town's web site such that residents and business owners may better understand their risks during winter travel.

- Continue to identify areas that are difficult to access during winter storm events and develop contingency plans for emergency personnel.

11.1.5 Recommendations Applicable to Earthquakes

- Ensure that town departments have adequate backup supplies and facilities for continued functionality in case earthquake damage occurs to these buildings and critical facilities. This should be part of the regional critical facility study discussed in Section 2.8.

- Consider preventing residential development in areas prone to collapse such as below steep slopes or in areas underlain by stratified drift and prone to liquefaction.

11.1.6 Recommendations Applicable to Wildfires

- Continue to evaluate dry hydrants, fire ponds, and areas at risk of wildfire in the town if /when they develop.

- Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes from wildfires. Educational materials should be made available at the Town Hall.

- Ensure that provisions of town regulations regarding fire protection facilities and infrastructure are being enforced.

11.1.7 Recommendations Applicable to Dam Failure

- Work with the DEEP to ensure that the owners of high hazard dams that could impact the town have a current EOP. If an EOP has not been developed, the town should work with the dam owner and DEEP to ensure one is developed. Town officials should work with both owners of high and substantial hazard dams in town to ensure that EOPs are on file and remain current. Town Hall should keep a copy of such plans.

- Provide assistance to owners of lesser-ranked dams regarding resources available for inspections and maintenance. This includes seven additional registered dams within Bozrah according to the DEEP "1996 Dam Inventory" datalayer.

11.2 Prioritization of Specific Recommendations

As explained in Section 11.3 of the Multi-Jurisdictional HMP, the STAPLEE method was utilized in this annex to prioritize recommendations. Table 11-1 presents the STAPLEE matrix for the Town of Bozrah. Each recommendation includes the department or commission responsible for implementing the recommendation, a proposed schedule, and whether or not the recommendation is new or originally from the previous HMP. Refer also to Section 2.7 for the list of previous plan recommendations and whether or not each recommendation was carried forward into this HMP.

TABLE 11-1: TOWN OF BOZRAH STAPLEE MATRIX FOR PRIORITIZING RECOMMENDATIONS

Implementation of Current Recommendations	Existing or New Recommendation?	Responsible Department[1]	Schedule	Cost[2]	Potential Funding Source[3]	Weighted STAPLEE Criteria[4]															Total STAPLEE Score
						Benefits								*Costs*							
						Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	
ALL HAZARDS																					
Regional Coordination																					
Continue to promote inter-jurisdictional coordination efforts for emergency response	New	BS, FD	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Continue to promote local and regional planning exercises that increase readiness to respond to disasters	New	BS	2012-2017	Low	OB	1	1	1	1	1	0.5	1	**8.0**								**0.0**	***8.0***
Continue to evaluate communication capabilities and pursue upgrades to communication and ensure redundant equipment is available	Existing	FS, FD	2012-2017	Low	OB, CI	1	1	1	1	1	1	1	**9.0**						-0.5		**-1.0**	***8.0***
Continue to promote regional transportation planning through SCCOG	Existing	BS	2012-2017	Low	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
Work with the SCCOG to perform a regional study of the vulnerability of critical facilities to natural hazard damage	New	FS	2012-2017	Low	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
Local Emergency Response																					
Continue to review and update the town EOP at least once annually	Existing	BS, FD	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Continue to maintain emergency response training and equipment and upgrade equipment when possible	Existing	BS, FD	2012-2017	Moderate	OB, CI	1	1	1	1	1	0.5	1	**8.0**						-0.5		**-1.0**	***7.0***
Encourage town officials to attend FEMA-sponsored training seminars at EMI	New	FS	2012-2017	Minimal	OB	0.5	0.5	1	1	1	1	0.5	**7.0**								**0.0**	***7.0***
Continue to evaluate emergency shelters, update supplies, and check communication equipment	Existing	FS, FD	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Pursue American Red Cross-certifcation of Fields Memorial School, Bozrah Moose Lodge 950, and the Volunteer Fire Company	New	FS, FD	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Continue to promote dissemination of public information regarding natural hazard effects into local government and community buildings	Existing	FS, ZE	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Enroll Bozrah in the CT Alert Emergency Notification System, then encourage residents and businesses to register on the State web site	New	FS, FD	2012-2017	Moderate	OB	1	1	1	1	1	0.5	1	**8.0**								**0.0**	***8.0***
Prevention																					
Develop a checklist for land development applicants that cross-references the specific regulations and codes related to disaster resilience	New	ZE	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**			-0.5					**-0.5**	***7.5***
Integrate additional elements of this HMP into the Plan of Conservation and Development into the 2013 update and beyond	New	PZ, ZE	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**			-1	-0.5				**-1.5**	***7.5***
Consider requiring underground installation of utilities for new development to the greatest extent/feasibility	New	PZ	2012-2017	Minimal	OB	1	1	1	1	1	0.5		**7.0**	-0.5			-0.5				**-1.0**	***6.0***
Continue reviewing building plans to ensure proper access for emergency vehicles	New	FD	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Continue to enforce the appropriate building code for new building projects	New	ZE	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Encourage residents to install and maintain lightning rods on their structures	New	FD, ZE	2012-2017	Minimal	OB	1	0.5	1	1	1	1	0.5	**7.5**								**0.0**	***7.5***
Natural Resource Protection & Open Space																					
Continue to regulate development in protected and sensitive areas including steep slopes, wetlands, and floodplains	New	PZ	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
INLAND FLOODING																					
Prevention																					
Continue to regulate new development activities within SFHAs to the greatest extent possible within town land use regulations	New	PZ	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Require developers to demonstrate whether detention or retention of stormwater is the best option for reducing peak flows downstream	New	PZ	2012-2017	Minimal	OB	0.5	1	1	1	1	1	0.5	**8.0**								**0.0**	***8.0***
Conduct an annual inspection of floodprone areas that are publically accessible and recommend drainage improvements as appropriate	New	PW	2012-2017	Low	OB	1	1	1	0.5	1	0.5	0.5	**7.0**								**0.0**	***7.0***
Upgrade culverts along Old Salem Turnpike to reduce flooding near Wawecus Hill	New	PW	2012-2017	High	CI*																	
Property Protection																					
Incorporate information on the availability of flood insurance into all hazard-related public education workshops	New	ZE, FS	2012-2017	Low	OB	1	1	0.5	0.5	1	1		**7.0**	-0.5							**-0.5**	***6.5***
Make available FEMA-provided flood insurance brochures and encourage residents to purchase insurance if they are in a SFHA	New	ZE, FS	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Provide technical assistance to owners of non-residential structures that suffer flood damage regarding flooding measures	New	FS, FD	2012-2017	Low	OB	1	0.5	0.5	1	1	1	0.5	**7.0**								**0.0**	***7.0***
Encourage residents to submit flood insurance claims following damage events	New	All	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Emergency Services																					
Pursue mutual aid agreements with non-profits to provide volunteer labor for esponse activities	New	FS, FD	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***

TABLE 11-1: TOWN OF BOZRAH STAPLEE MATRIX FOR PRIORITIZING RECOMMENDATIONS

Implementation of Current Recommendations	Existing or New Recommendation?	Responsible Department [1]	Schedule	Cost [2]	Potential Funding Source [3]	Weighted STAPLEE Criteria [4]															Total STAPLEE Score
						Benefits								*Costs*							
						Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	
Public Education and Awareness																					
Conduct a "Natural Hazards Fair" and consider working different "Hazard Weeks" into the town's public education program	New	FS, FD	2012-2017	Moderate	OB	1	1	0.5	0.5	1	1		**7.0**			-0.5	-0.5				**-1.0**	***6.0***
Visit schools and educate children about the risks of flooding and how to prepare	New	FD	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Encourage builders, developers, and architects to become familiar with NFIP land use and building standards at annual workshops	New	PL, ZEO	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**			-0.5					**-0.5**	***7.5***
Natural Resource Protection																					
Pursue the acquisition of additional municipal open space in SFHAs	New	BS	2012-2017	High	OB	1	1	1	1	1	1	1	**9.0**						-1		**-2.0**	***7.0***
Continue to aggressively pursue wetlands protection and incorporate performance standards into subdivision reviews	New	PZ	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**	-0.5		-0.5					**-1.0**	***8.0***
Structural Projects																					
Utilize the recently available extreme rainfall data to determine existing culvert sizing and encourage upgrades where undersized	New	PW	2012-2017	Moderate	CI	0.5	1	1	0.5	1	1		**7.0**						-1		**-2.0**	***5.0***
Continue to perform catch basin and culvert surveys to prioritize upgrades and perform maintenance and cleaning	Existing	PW	2012-2017	Moderate	OB	1	1	1	1	1	0.5	0.5	**7.5**								**0.0**	***7.5***
Investigate funding for a new culvert for Old Salem Turnpike near the Norwich city line	New	FS	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
WIND DAMAGE FROM HURRICANES, TROPICAL STORMS, SUMMER STORMS, TORNADOES, AND WINTER STORMS																					
Prevention																					
Encourage BL&P to also cut down trees as opposed to just trimming trees near their power lines	New	FS	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**							-0.5	**-0.5**	***8.5***
Continue to perform appropriate tree maintenance to the greatest extent possible	Existing	PW	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**							-0.5	**-0.5**	***8.5***
Property Protection																					
Promote the use of functional shutters for older buildings in the town and investigate funding sources	New	ZE, PZ	2012-2017	Minimal	OB, CI	1	0.5	1	1	1	0.5		**6.0**								**0.0**	***6.0***
Make information on wind-resistant construction techniques available to all building permit applicants	New	ZE, PZ	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Encourage commercial building owners to develop emergency response plans and identify mitigation opportunities	New	PL, FD	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Emergency Services																					
Identify a location for a brush disposal operation for dealing with debris following wind storms and determine potential reuse	New	PW	2012-2017	Minimal	CI	0.5	1	1	1	1	1		**7.5**								**0.0**	***7.5***
Consider surveying all town-owned buildings to determine their ability to withstand wind loading giving priority to the oldest buildings	New	ZE, BD	2012-2017	Low	OB	1	0.5	1	0.5	1	0.5		**5.5**								**0.0**	***5.5***
Develop agreements with landowners and companies to chop/chip to ensure backup plans are in place for debris removal	New	PW, FS	2012-2017	Low	OB	0.5	0.5	1	0.5	1	0.5		**5.0**								**0.0**	***5.0***
Public Education and Awareness																					
Visit schools and educate children about the risks of wind events and how to prepare for them	New	FD	2012-2017	Low	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
WINTER STORMS																					
Consider drafting a written plan for inspecting and prioritizing the removal of snow from town-owned structures	New	ZE, FS	2012-2017	Low	OB	0.5	1	1	1	1	0.5		**6.5**								**0.0**	***6.5***
Continue making funding available to the Public Works Department each year for clearing snow from roads and parking lots	New	BS	2012-2017	High	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
Provide information for protecting Town residents during cold weather and for mitigating icing and insulating pipes at residences	New	ZE	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Consider posting snow plow routes in Town Hall and on the town's web site so residents and businesses better understand procedures	New	ZE, PW	2012-2017	Moderate	OB	1	1	1	0.5	0.5	1		**7.0**			-0.5			-1		**-2.5**	***4.5***
Continue to identify areas that are difficult to access during winter storm events and develop contingency plans to access such areas	New	FD, PW	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
EARTHQUAKES																					
Ensure that town departments have adequate backup supplies and facilities for continued functionality following an earthquake	New	BS	2012-2017	Moderate	OB, CI		0.5	1	0.5	0.5			**3.0**		-0.5		-1				**-2.0**	***1.0***
Consider preventing residential development in areas prone to collapse such as below steep slopes or areas prone to liquefaction	New	PZC	2012-2017	Minimal	OB	0.5	1	1	0.5	0.5	1	0.5	**7.0**				-0.5				**-0.5**	***6.5***

TABLE 11-1: TOWN OF BOZRAH STAPLEE MATRIX FOR PRIORITIZING RECOMMENDATIONS

Implementation of Current Recommendations	Existing or New Recommendation?	Responsible Department[1]	Schedule	Cost[2]	Potential Funding Source[3]	Weighted STAPLEE Criteria[4]															Total STAPLEE Score
						Benefits								*Costs*							
						Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	
WILDFIRES																					
Continue to evaluate fire flows, available water supply, and areas at risk of wildfire in the town if/when they develop	New	FD	2012-2017	Minimal	OB	1	1	1	1	1	1	0.5	**8.5**								**0.0**	***8.5***
Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes	New	FD	2012-2017	Low	OB	1	1	1	1	1	0.5	1	**8.0**								**0.0**	***8.0***
Ensure that provisions of town regulations regarding fire protection facilities and infrastructure are being enforced	New	PD	2012-2017	Low	OB	0.5	0.5	1	0.5	1	0.5		**5.0**								**0.0**	***5.0***
DAM FAILURE																					
Work with the DEEP to ensure that the owners of high hazard dams maintain current EOPs and keep local copies	New	FS	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Provide assistance to the owners of lesser ranked dams regarding resources available for inspections and maintenance	New	ZE	2012-2017	Minimal	OB	0.5	0.5	0.5	0.5	1		0.5	**4.0**								**0.0**	***4.0***

NOTES

1. Departments:
   BS = Board of Selectmen
   FS = First Selectman
   FD = Fire Department
   PW = Public Works Department
   PL = Planning Department
   PZ = Planning & Zoning Commission
   EM = Emergency Mangement Director
   ZE = Zoning Enforcement Official
   BD = Building Department
2. Minimal = To be completed by staff or volunteers where costs are primarily printing, copying, or meetings; Low = Costs are less than $10,000; Moderate = Costs are less than $100,000; High = Costs are > than $100,000.
3. OB = Operating Budget; CI = Capital Improvement budget; a * indicates that grant funding is needed and will be pursued
4. A beneficial or favorable rating = 1; an unfavorable rating = -1. Technical and Financial benefits and costs are double-weighted (i.e. their values are counted twice in each subtotal)

APPENDIX A

ADOPTION RESOLUTION

TOWN OF BOZRAH HAZARD MITIGATION PLAN UPDATE RESOLUTION

WHEREAS, the Town of Bozrah has historically experienced severe damage from natural hazards and is continues to be vulnerable to the effects of flooding, thunderstorms, high wind, winter storms, wildfires, earthquakes, and dam failure, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the Southeastern Connecticut Council of Governments, of whom the Town of Bozrah is a member, has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update under the requirements of 44 CFR 201.6;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedures for the Town of Bozrah;

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Bozrah, with the effect of protecting people and property from loss associated with those hazards;

WHEREAS, adoption of this Plan will make the Town of Bozrah eligible for funding to alleviate the impacts of future hazards;

NOW THEREFORE BE IT RESOLVED by the Board of Selectmen of the Town of Bozrah that:

1. The Plan is hereby adopted as an official plan of the Town of Bozrah;

2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;

3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by October 1 of each calendar year.

PASSED by the Board of Selectmen this 20th day of November 2012.

William E. Ballinger
1st Selectman
Bozrah, CT

TOWN OF BOZRAH
OFFICE OF THE FIRST SELECTMAN
1 RIVER ROAD
BOZRAH, CT 06334