

# 2018 Hazard Mitigation Plan Update

Town of Foster, Rhode Island

PREPARED FOR

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Town of Foster, RI  
Town Hall  
181 Howard Hill Road  
Foster, RI 02825  
401-392-9200

PREPARED BY

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AUGUST 2018

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**A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF FOSTER  
AUTHORIZING THE ADOPTION OF THE  
2018 FOSTER HAZARD MITIGATION PLAN UPDATE**

**WHEREAS**, the Town of Foster recognizes exposure to natural hazards that increase the risk to life, property, environment, within our community; and

**WHEREAS**; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

**WHEREAS**, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

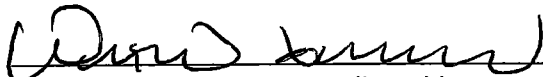
**WHEREAS**; the 2018 Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Foster from impacts of future hazards and disasters; and

**WHEREAS**, adoption by the Town Council demonstrates their commitment to hazard mitigation and achieving goals outlined in the 2018 Foster Hazard Mitigation Plan Update.

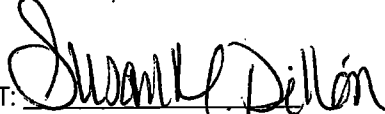
**NOW, THEREFORE, BE IT RESOLVED** that the Town of Foster

1. Adopts in its entirety, the 2018 Foster Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Natural Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.
2. Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
3. Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
4. Will continue its support of the Hazard Mitigation Committee as described within the Plan.
5. Will help to promote and support the mitigation successes of all participants in this Plan.
6. Will incorporate mitigation planning as an integral component of government and partner operations.
7. Will provide an update of the Plan every five years.

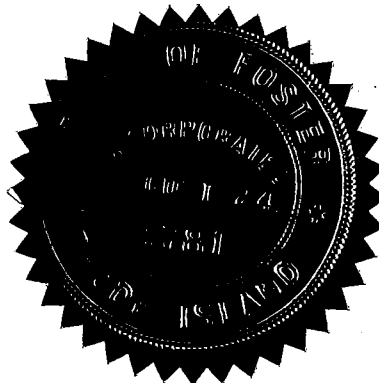
PASSED AND ADOPTED on September 13, 2018



Denise DiFranco, Town Council President, Town of Foster

ATTEST: 

Susan M. Dillon, Clerk, Town of Foster



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## Executive Summary

This Hazard Mitigation Plan (HMP) is a product of the Foster Hazard Mitigation Planning Committee (HMPC). It has been approved by the Foster Town Council, the Rhode Island Emergency Management Agency, and the Federal Emergency Management Agency in accordance with the Disaster Mitigation Act of 2000.

The HMPC's overview of past natural hazard occurrences verifies that the Town is vulnerable to diverse events including high winds, snow storms, and ice. The discussion puts the likelihood of these events into historical perspective and recognizes that although the probability of lightning may be higher; the intensity and potential impacts from less likely events such as Nor'easters can be far greater.

The risk assessment portion of the plan confirms that the Town has much to lose from these events. The most vulnerable assets include roads prone to washout, communication equipment, critical municipal hazard response facilities, residents, businesses, and historic resources.

To address these risks, the 2018 HMP put forth a clear mission, a distinct set of goals and eight (8) specific mitigation actions. The Town's hazard mitigation mission is to preserve and enhance the quality of life, property and resources by identifying areas of the community that are at risk from natural hazards and by implementing specific mitigation actions in order to protect the infrastructure, population and historical, cultural and natural resources in Foster. The specific goals include protecting the lives and property of the Town of Foster's residents; protecting the Town of Foster's critical facilities and infrastructure; and protect the town's cultural, historical, natural, and economic resources. Each of the subsequent mitigation actions for achieving these goals summarizes specific problems and possible solutions, details the primary tasks to be undertaken, identifies an appropriate lead and anticipated funding sources.



# 1

## Introduction

### Plan Purpose

The purpose of the Hazard Mitigation Plan is to set forth guidelines of short-term and long-term actions, which will reduce the actual or potential loss of life and/or property from hazardous events such as high winds, hurricanes and nor'easters, ice storms, snow storms, lightning, brushfires, drought, and extreme temperatures. This Plan was constructed using input from a variety of municipal and private stakeholders and the general public involved in the planning process. This Plan serves as guidance to help the Town reduce their losses and vulnerabilities relating to natural hazards.

### Hazard Mitigation and Benefits

Hazard mitigation planning consists of a series of actions taken to identify specific areas that are vulnerable to natural and human-caused hazards within a town, and seek to permanently reduce or eliminate the long-term risk to human life and property. It coordinates available resources and identifies community policies, actions, and tools for implementation that will reduce risk and the potential for future losses town-wide. The process of natural hazard mitigation planning sets clear goals, identifies appropriate actions, and produces an effective mitigation strategy that can be updated and revised to keep the plan current. In short, 'it's where we were, where we are and where we're going' in terms of hazard mitigation.

States and communities across the country are slowly, but increasingly, realizing that simply responding to natural disasters, without addressing ways to minimize their potential effect, is no longer an adequate role for government. Striving to prevent unnecessary damage from natural disasters through proactive planning that characterizes the hazard, assesses the community's vulnerability, and designs appropriate land-use policies and building code requirements is a more effective and fiscally sound approach to achieving public safety goals related to natural hazards.

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation to improve this planning process. It reinforces the importance of natural hazard mitigation planning and establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP) and other annual funding opportunities. Section 322 of the Act specifically addresses mitigation planning at the state and municipal levels of government. It identifies new requirements that allow HMGP funds to be used for planning activities. As a result of this Act, states and communities must now have a FEMA- approved natural hazard mitigation plan in place prior to receiving post-disaster HMGP funds. In the event of a natural disaster, municipalities that do not have an approved natural hazard mitigation plan will not be eligible to receive post-disaster HMGP funding.

The purpose of this Plan is to recommend actions and policies for the Town of Foster to minimize social and economic loss and hardships resulting from natural hazards. These hardships include the loss of life, destruction of property, damage to critical infrastructure and critical facilities, loss/interruption of jobs, loss/damage to businesses, and loss/damage to significant historical structures. Hazardous events that affect Foster include high winds, crippling snow storms, and heavy rain. To protect present and future structures, infrastructure and assets and to minimize social and economic hardships, the Town of Foster implements the following general actions and policies:

- › Revisions to the Town's Comprehensive Plan.
- › Incorporation of hazard mitigation into the site plan review process.
- › State and local building code review.
- › Public education/outreach.
- › Post-disaster recovery opportunities/strategies.

The Town of Foster also recognizes the important benefits associated with hazard mitigation, its interaction with municipal land use and infrastructure planning, and the need for a comprehensive planning approach, which accommodates these interdependencies. Foster's Comprehensive Plan (2018) addresses natural and cultural resources, land use, housing, services and facilities, traffic circulation, open space, economic development, and future development trends. While the entire Hazard Mitigation Plan will not be formally incorporated into the Comprehensive Plan updates, certain, applicable mitigation actions will be incorporated during the

update process. The Town recognizes coordination between the Hazard Mitigation Plan and the Comprehensive Plan to be of benefit because it will ensure a unified planning approach into the future and ensure that risk reduction remains a critical element of municipal planning. This is also in alignment with current goals of Rhode Island Statewide Planning which requires a natural hazards component to be included in the Comprehensive Plan.<sup>1</sup>

A second benefit of hazard mitigation allows for a careful selection of risk reduction actions through an enhanced collaborative network of stakeholders whose interests might be affected by hazard losses. Working side by side with this broad range of stakeholders can forge partnerships that pool skills, expertise, and experience to achieve a common goal. Proceeding in this manner will help the Town ensure that the most appropriate and equitable mitigation projects are undertaken.

A third benefit of hazard mitigation would be endorsing a proactive planning approach focused on sustainability, whereby the Town of Foster could minimize the social and economic hardships that have resulted from the occurrence of previous natural disasters. These social and economic hardships include: the loss of life, destruction of property, interruption of jobs, damage to businesses, and the loss of historically significant structures and facilities. This proactive planning approach would look for ways to combine policies, programs, and design solutions to bring about multiple objectives and seek to address and integrate social and environmental concerns. Linking sustainability and loss reduction to other goals can provide a framework within the state and local governments that will bring the comprehensive planning process full circle.

Lastly, the participation in a hazard mitigation planning process will establish funding priorities. The formal adoption and implementation of this Plan will allow the Town of Foster and its residents to become more involved in several programs offered by the Federal Emergency Management Agency (FEMA) including: the Community Rating System Program (CRS); the Pre-Disaster Mitigation Program (PMA); the Flood Mitigation Assistance Program (FMA); and the Hazard Mitigation Grant Program (HMGP). Money spent today on preventative measures can significantly reduce the cost of post-disaster cleanup tomorrow.

## Goals

The Town of Foster has established the following mission statement for the Foster Hazard Mitigation Plan:

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<sup>1</sup> Rhode Island Statewide Planning, *Rhode Island Comprehensive Planning Standards Manual, Section 12. Planning For Natural Hazards and Climate Change*. January 14, 2016.

*“To preserve and enhance the quality of life, property and resources by identifying areas of the community that are at risk from natural hazards and by implementing specific mitigation actions in order to protect the infrastructure, population and historical, cultural and natural resources in Foster.”*

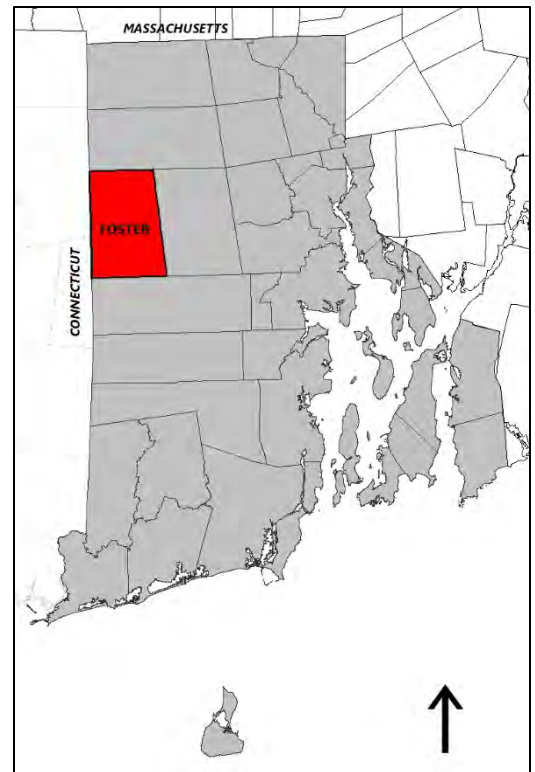
The Town has established the following mitigation goals:

- › Implement actions which protect the lives and property of Foster’s residents.
- › Implement actions which protect Foster’s critical facilities and infrastructure.
- › Implement actions which protect Foster’s cultural, historical, natural and economic resources.

## Background

The Town of Foster (52 square miles which includes the villages of Hopkins Mills, Clayville, Moosup Valley, North Foster, and Mount Vernon). Foster is surrounded by the rural communities of Glocester, Scituate, and Coventry, RI as well as the Town of Killingly, Connecticut to the west. The unique cultural landscape retains the image and feel of an earlier time of rural tranquility. The Town has many historic features including houses, farmsteads, stone walls, roads, and mill ruins. Originally covered in hardwood forests, Foster, by the early 19<sup>th</sup> century, was almost totally cleared, a result of both agricultural endeavors and forest processing industries. Today much of the land has reverted to forest, transected by both paved and unpaved roads. Most of these roads are lined with old stone walls, open fields, and woods.<sup>2</sup>

**Figure 1: Foster, RI**



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<sup>2</sup> Town of Foster Draft Comprehensive Plan, 2018

## History

From the 2018 Draft Comprehensive Plan:

*“The recorded history of present-day Foster stretches back to the Archaic period (6,000 to 500 BCE) and it is likely the land was used for game hunting and temporary camping as early as 8,300 BCE. Changes in climate and advances in technology through succeeding centuries allowed the Native American population to grow and transition from small hunter-gatherer groups to largely permanently-settled tribes. The Narragansett tribe was the dominant power in the area before the chartering of Rhode Island (1663) and continued to be so until its defeat in King Philip’s War (1675-1676). The conflict culminated with the spreading of European-originated diseases which significantly decreased the Narragansett population and the size of other local tribes, such as the Nipmuc who controlled the western half of present-day Foster.*

*Colonial settlement west from Providence’s town center occurred steadily through the seventeenth century and the first building in Foster was constructed in the early 1700s. The continued growth in the outlands population was responded to in 1731 with the establishment of three towns from Providence’s original land – Glocester, Scituate and Smithfield. The Town of Foster was incorporated out of Scituate half a century later, during the Revolutionary period. Local development continued into the nineteenth century and peaked in 1820, at which time the country’s industrialization and territorial expansions west stunted Foster’s economy and population until the 1960s.*

*It is not hard to view the entire town as an important and unique cultural landscape which retains the image and feel of an earlier time of rural tranquility and quietness. Although prosaic, this description is meaningful as these qualities are highly valued by Foster residents and often cited as a main reason for relocating to the community.”*

## Demographics

The Town of Foster has seen a slight increase in population since the 2000 U.S. Census. The estimated population for the Town in 2010 is 4,606, an increase of 8%. In the tables below are some of the available demographic and social characteristics of the Town. These tables are based on the 2010 population estimate of 4,606.

**Table 1: Demographics**

<b>Age</b>	<b>Number</b>	<b>%</b>
<b>Under 5</b>	212	4.6
<b>65+</b>	591	12.8
<b>Median Age</b>	44.8	-
<b>Majority Race: White</b>	4,454	96.7%
<b>Minority Population</b>	152	3.3%

Defined as the number of housing units with one or more occupants, the number of households is equivalent to the number of occupied housing units in a place. Foster had 1,707 households at the time of the 2010 Census, of which 1,302 (76%) were

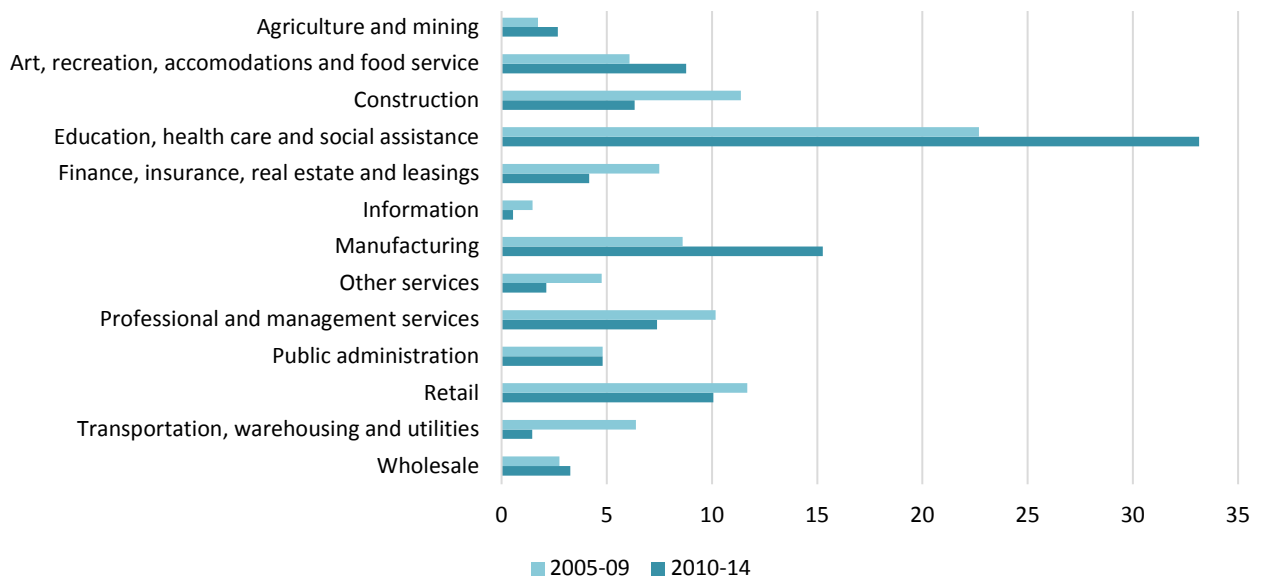
families and 405 (24%) were nonfamilies. The average household size was 2.68 persons.

**Table 2 Demographic Changes**

	2010	2015	% Change
<b>Housing Units</b>	1,690	1,809	+7%
<b>Population</b>	4,556	4,671	+2.5%

The average annual income in Foster is \$79,909.<sup>3</sup> Using data from the American Community Survey data, the chart below from shows the shifts in employment by industry for workers from Foster.

**Figure 2: Employment Trends**



Source: Town of Foster Draft Comprehensive Plan, 2018

Generally, Foster residents have proven themselves as self-reliant and community oriented. Being largely rural, most households have back-up generators and wood burning stoves or fireplaces to make life more comfortable when the power goes out for days. According to members of the HMPC, residents often rely on each other and neighbors before seeking assistance from local officials.

<sup>3</sup> American Community Survey. 2011-2015 American Community Survey 5-year Estimates.

## Government

The Town of Foster, as part of the Town of Providence, was founded in 1636 and incorporated as its own municipality on August 24, 1781. The Town operates under a Home Rule Charter adopted in 1976 that provides for a Town Council form of government with a five-member Council. Each Town Council member is elected at-large for a term of two years. The Council is led by a Town Council President, who is elected by the Town Council members. Per the Town Charter, the Town Council President “shall be recognized as the head of the Town government.” The Town Council President works closely with the Town Clerk, who is also an elected official. The Town Clerk is the Director of the Department of Administration and oversees administration of the Town Hall.<sup>4</sup>

## Land Use Patterns

The total area of Foster is approximately 84% forested, 7% residential, 4% agriculture, 2% water, 0.25% commercial/industrial, and 2.75% of other uses (i.e. roads, gravel pits, etc.). The residential and agriculture areas are located alongside the road corridors. The largest bodies of water (Westconnaug Reservoir and Barden Reservoir) are located on the eastern side of Foster. There are also smaller rivers and streams throughout town.

**Figure 3 Land Use Type –Foster, RI**



<sup>4</sup> Town of Foster Draft Comprehensive Plan, 2018



There is no centralized core or commercial district in Foster. Economic development has been limited by the rural character of the town and suitability of sites for wells and onsite wastewater treatment systems (OWTS).

**Table 3 Land Use**

<b>Land Use Type<sup>5</sup></b>	<b>2003/2004 Acres</b>	<b>2011 Acres</b>	<b>% Change</b>
Residential	2,020	2,255	+ 12%
Commercial/Industrial	82	82	- 2%
Forested	28,421	28,064	- 36%
Agriculture/Pasture	1,205	1,284	- 6%

### **Public Safety**

Law enforcement and protection of persons and property is provided by the Police Department's eight sworn officers supported by four professional employees. The Police Department operates a twenty-four-hour patrol. Average response time to an emergency dispatched call is approximately six to eight minutes throughout the town. The police station and Emergency Operations Center is located in the historic Aylsworth House in Foster Center. In December 2017, the Town appointed a new Emergency Management Director. The Director is supported by the Assistant Emergency Management Director.

The three (3) Foster fire districts (Foster Center, Moosup Valley, and South Foster) provide first response to major disasters. Fire fighters are trained in various matters which include search and rescue, EMT services, and firefighting.

The Paine School serves as the local emergency shelter but is not Red Cross certified.

### **Roads and Bridges**

"The transportation network in Foster grew out of Providence merchants' commercial interests and the most common modes of travel at the time – by foot, horse or drawn carriage. Foster's transportation network today still consists of major highways running east-west through the Town connected by local north/south roads. The major highways continue to provide access through the town to destinations such as Providence and the State of Connecticut while the local roads provide access to the farms, villages and neighborhoods.

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5 RIGIS Land Use Data from 2003/2004 and 2011 (most recent).

Foster is located approximately 12 miles from Interstate 295 in Rhode Island, and about 4 miles from Interstate 395 in Connecticut. Foster contains five numbered state routes. East-west routes are:

- Route 6 (Danielson Pike): a major connector between Interstate 295 in Rhode Island and Interstate 395 in Connecticut that includes the primary area of commercial development in the community.
- Route 101 (Hartford Pike): branches off Route 6 in Scituate and joins Route 44, a major connector between Providence and Connecticut.
- Route 14 (Plainfield Pike): provides Foster residents with the most direct route to urban centers in Johnston, Cranston and Providence.
- Route 102 (Victory Highway): provides a north/south route which passes through Scituate to the east and through the rural areas of Foster and West Greenwich to the South, connecting to Route I-95 in West Greenwich.
- Route 94 (Foster Center Road/ Mount Hygeia Road): connects Route 102 and Route 6.

Other state roads are Central Pike (east of Foster Center Road Route 94), Cucumber Hill Road and Moosup Valley Road.

The major municipal roadways are Howard Hill Road, Walker Road, Johnson Road, South Killingly Road, Kennedy Road, and East Killingly Road. These roads are relatively narrow and winding, which helps to keep automobile drivers travelling at safe speeds and helps protect the character of the community. Many minor local roads are unpaved. Unpaved roads require frequent repairs and maintenance of erosion control measures but are an important part of the rural character. Tom Wood Road and portions of Tray Hollow Road, George Washington Highway, Luther Road, Howard Hill Road, Biscuit Hill Road, Weatherbee Road, Goldmine Road, Central Pike, and Rickard Road are all unimproved local public roadways.

Foster contains 16 major bridges, seven of which are maintained by the state. Four bridges – Central Pike, Dolly Cole, Moosup Valley and Spears – are posted with weight limits and three – Hemlock, Hopkins Mill, and Hemlock Road – are closed. Recently, the bridges on Mill Road and Plain Woods Road were repaired after damage from flooding which occurred in spring 2010. Much of the repairs were funded through FEMA grants. The bridge on Winsor Road was repaired in 2014

using municipal funds. The Town of Foster should consider the option of repair and maintenance of town bridges to be done by the Department of Public Works.”<sup>6</sup>

## **Utilities**

There are only 2 power lines coming into the Town of Foster. This makes the town much more vulnerable to wind and ice events. Historically when there are widespread power outages, the town is not always a priority for restoration work because of the low population density. The residents of Foster are generally prepared with generators and wood stoves to get them through periods without power.

Foster residents are served by private wells and OWTS. There are no public water or public sewer facilities.

## **Forest and Open Space**

Forests and farms help shape the identity of Foster. There are over 28,000 acres of forested areas in Foster (RIGIS Land Cover database). Providence Water Supply Board, Land Trust, and Audubon Society holdings support conservation and open space preservation.

## **Water Resources**

The Town of Foster is traversed by rivers, brooks and streams. There are various reservoirs and ponds covering a total of 448 acres. These waters provide essential habitat and many support fishing and swimming criteria. The town relies on wells for drinking water and does not have any significant groundwater resources. Water bodies of significance include:

- › Barden Reservoir
- › Westconnaug Reservoir
- › Shippee Sawmill Pond
- › Hopkins Mill Pond
- › Spear Pond
- › Clark Pond
- › Porter’s Pond
- › Ponaganset River and tributaries

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<sup>6</sup> Town of Foster Draft Comprehensive Plan, 2017

- › Dolly Coke Brook
- › Hemlock Brook
- › Westconnaug Brook
- › Moosup River and tributaries
- › Scituate Reservoir Watershed (most of Foster is located in this watershed)

### **Historic and Cultural Resources**

Foster Preservation Society (FPS) is the primary organization involved in historic preservation locally and an active collaborator with both the town and the state. Examples of this include its involvement in supporting RIHPHC's nominations of historic places to the NRHP and compiling a video related to the Historic Barns survey. The group also works independently to provide educational lectures at area libraries and schools. FPS also houses a large collection of several hundred historical documents, genealogical records, photographs, postcards and tax lists at its office in the historic Meeting House. In more recent years, the digital recording of interviews with local residents has also begun as an additional resource for future generations.

The National Register of Historic Places recognizes four historic districts, three buildings, one farm, and a prehistoric archaeological site in Foster.

- Foster Center Historic District
- Hopkins Mills Historic District
- Moosup Valley Historic District
- Clayville Historic District
- Captain George Dorrance House
- Mount Vernon Tavern
- Mount Hygia/Solomon Drown House
- Borders Farm
- Breezy Hill Site

Foster's prized heritage is also located in its cemeteries and stone walls. The Foster Preservation Society has surveyed the historic cemeteries and documented nearly half of the inscriptions. The Town has also amended its Zoning Ordinance to ensure that any proposed alterations, relocations, excavations, dismantlings, or demolition of stone walls are identified in planning processes.

Cultural resources in Foster include libraries, the Foster-Glocester School District, Swamp Meadow Community Theatre, and Artist Open Studios. In late July, residents and neighbors come together for the annual Old Home Days- a tradition that dates back to 1904. Events include a community supper, pie eating contests, crafters, 4-H

shows, tractor pulls, and a skillet toss. For the paranormal enthusiasts, Foster is a popular visiting spot to witness hauntings throughout the year.

### **Development Trends Since the 2005 Plan**

Development trends have been stagnant. Rezoning on Route 6 from commercial to a combination of general business mixed use and agricultural/residential was completed in 2010 in an effort to stimulate sustainable growth in specified nodes. However, no major economic development in these targeted areas has been realized as of yet. Residential growth has been stable with growth expanding into Agricultural/Residential zones.

There has been an increase in solar development in Town since Foster's solar ordinance was passed in 2015. New applications for solar development, both commercial and residential, continue to be submitted. The Town is considering both a wind turbine ordinance and a marijuana ordinance that may allow this type of development, with appropriate restrictions.



# 2

## Planning Process

### Overview

The Town of Foster initiated the hazard mitigation planning effort on April 13, 2017 at the recommendation of the Foster Town Council. This Hazard Mitigation Plan Update is the result of a dedicated group of individuals working for about a year identifying natural hazards and proposing ways to improve Foster's resiliency.

### Foster Hazard Mitigation Plan Committee

This Hazard Mitigation Plan (HMP) is a product of the Foster Hazard Mitigation Plan Committee (HMPC). The HMPC was led by the Town Planner. Committee members include:

- Guenter Bay\*, Former EMA Director and Volunteer
- Robert Clarkin, DPW Director (left in December 2017)
- Paul Cuniff\*, Moosup Valley Fire Chief
- Denise DiFranco\*, Councilwoman
- Michael Dillon\*, Councilman
- T. Douglas Howell, DPW Director (as of January 2018)
- Cheryl Maynard, Town Planner (left in January 2018)
- Jennifer Siciliano, Town Planner (as of February 2018)

- Heidi Rodgers\*, EMA Director (as of December 2017)
- Kelli Ross, Town Treasurer
- William Ziehl, Police Chief

\*denotes Foster resident

## The Planning Process

This 2018 HMP is the result of a 7-step process that was initiated April 13, 2017 with the establishment of the HMPC by invitation from the Town Council. The Town hired a consultant to assist with this planning effort.

Step two started the Plan development process and included the first meeting of the HMPC on June 29, 2017. The HMPC met regularly.

The City's previous Plan was dated 2005, so the first meeting focused on re-ranking hazards and discussing the process for updating the plan. At this initial meeting, the group reviewed a set of questions to be included in an online public survey. The purpose of the survey was to capture the local residents' perception of natural hazards.

The link to the survey was widely distributed on social media and on the City's website. Over 50 people participated. See Appendix A for survey results.

Step three began with the HMPC meeting on June 29, 2017. After reviewing the hazards of concerns and survey results, the HMPC identified critical infrastructure and community assets within the town. Fifteen areas of vulnerability were identified: Flood prone drainage systems, roads that wash out, bridges, wastewater, water supply systems, utility facilities, dry hydrants, communication towers, dams, critical municipal hazard response facilities, populations, businesses, schools, recreation facilities, and historic resources. During discussions, the group decided that although important for the function of the Town, the following were not identified as being particularly vulnerable at this time:

- › Bridges – In good condition, or in the process of being fixed.
- › Utility Facilities – ongoing mitigation actions
- › Dams – Well maintained
- › Schools – They have early warning and evacuation procedures. No current vulnerabilities.

During this early phase, the Town's consultant reviewed the existing Comprehensive Plan, local ordinances, StormReady Plan, and gathered information on current infrastructure projects going on within the Town.

Current town capabilities were discussed at the meeting on July 25, 2017. Many different departments, committees, and programs already engage in activities that help the town become more resilient to a variety of hazards. It is important to

highlight these capabilities and show how they support the Town’s hazard mitigation efforts.

Step four was creating an updated list of mitigation actions to reduce the impact to the identified vulnerable areas. On August 30, 2017, the HMPC reviewed the mitigation items that were proposed in the 2005 Plan. Status updates were given for all the previous actions. The incomplete actions that were still important were rolled into the list of actions for this 2018 Plan update.

Step five was completed at the October 3, 2017 meeting where the group brainstormed additional mitigation actions they wanted to include. During this meeting, the group decided that not all critical infrastructure needs a mitigation action within the lifespan of this Plan (5 years). Included in this step was proposing new actions, establishing action timelines, costs, and identifying responsible parties.

Step six focused on the prioritization of the mitigation actions. On November 15, 2017, the HMPC met as a group to prioritize their proposed actions and confirm additional action details. After this meeting, the consultant finished the draft of the Plan for committee review.

Step seven furthered the public input and review process with the Foster Town Council, and the general public for review and comment. The Plan was posted on the City’s website, Facebook, and made available at Town Hall and Library for public review. The Hazard Mitigation Plan was also emailed to Emergency Management Directors in the neighboring towns of Glocester, Scituate, Coventry, and Killingly, CT for their review and comments. No comments were received. At the Town Council meeting on June 14, 2018, the public and Council members were given an opportunity to provide comments on the draft Hazard Mitigation Plan. After the presentation by VHB there were questions about the planning process by the Council, and a question from the public.

**Table 4** provides a summary of the Committee’s meeting dates and the activities that they conducted:

**Table 4 Committee Meetings**

Date	Meeting Summary
04/13/2017	Recommendation by Town Council to appoint a Hazard Mitigation Committee
06/29/2017	Kick-Off Meeting: Discuss hazards of concern and survey questions
07/25/2017	Meeting #2: Vulnerabilities and survey responses
08/30/2017	Meeting #3: Discuss current capabilities and review 2005 mitigation actions
10/3/2017	Meeting #4: Mitigation actions
11/15/2017	Meeting #5: Review of mitigation actions and prioritization
---	Major staff changes at the Town affected the membership of the Committee
06/14/2018	Presented Draft to Town Council



Date	Meeting Summary
07/02/2018	Submitted plan to RIEMA for review
08/10/2018	Submitted to FEMA for review
	Adopted by the Foster Town Council

## Public Input

This Hazard Mitigation Plan benefits from various distinct types of public input strategies that were utilized by the HMPC during the drafting process and prior to its adoption by the Town Council. Public input for the Foster Hazard Mitigation Plan was primarily collected through a public survey, public meetings and an invitation to comment.

Early in the planning process, the HMPC promoted and distributed a “Hazard Perceptions” survey online. The purpose of the anonymous survey was to hear from residents the hazards and neighborhoods they are most concerned about. Over 50 individuals participated in the survey. Not surprisingly, most were concerned about hurricanes/tropical storms, snow/blizzards, ice storms, and high winds. The survey also provided the HMPC with a list of problematic areas that are susceptible to flooding. The HMPC used the input from the survey to focus their mitigation planning efforts.

The 2018 HMPC included town residents. The HMPC’s roles focused on reviewing the content of the risk assessment matrix to ensure proper classification of problems and estimates of potential impacts; formulation of mitigation actions and sequencing of primary tasks; and identification of feasible implementation methods and schedules. Their comments were incorporated into the final 2018 Hazard Mitigation Plan.

Prior to public release of the 2018 HMP, the HMPC drafted the plan through a series of committee meetings. While these meetings did not rise to the level of public hearings and were not advertised, they were open to the public.

Another public input strategy was geared toward the general public as opposed to specific stakeholders. During the draft review portion of the plan development, an electronic copy of the draft 2018 HMP was posted to the Town’s website. The public was informed of both the webpage posting and the public hearing. See Appendix B. They were encouraged to review the document, comment on the HMP and attend the meeting. Notice of the public hearing was also posted as an agenda item on the City’s website in accordance with state law. On June 14, 2018, the Town Council held a discussion on the HMP as part of their regular public meeting. At the Town Council meeting, there was a question from the general public about re-connecting dead end streets to aid in emergency response. Foster emergency responders have not considered dead end streets to hamper their response efforts but will consider it the next time this plan is reviewed. There were no further comments from the general public.

Review and comments from the Federal Emergency Management Agency and the Rhode Island Emergency Management Agency were also incorporated prior to adoption by the Town Council.

Before the HMPC began meeting regularly, the Town was working on updating their Comprehensive Plan which includes discussions on floodplains, resource protection districts, and development trends. Members of the HMPC will be involved in the Comprehensive Plan update and will be incorporating elements of this document into the other plan.



# 3

## Natural Hazards

### Hazards of Concern

The Rhode Island 2016 Hazard Identification and Risk Assessment and 2005 Foster Hazard Mitigation Plan were used as a starting point for identifying hazards that pose the largest threat to the Town. The following table summarizes the hazards identified by the Foster Hazard Mitigation Plan Committee.

**Table 5 Hazards Identified by the Foster Hazard Mitigation Plan Committee**

Natural Hazards Identified by the State	Identified by the HMPC
<b>Severe Winter Weather</b>	
<i>Ice Storm</i>	✓
<i>Snow</i>	✓
<b>Flood</b>	
<i>Riverine</i>	✓
<i>Coastal</i>	-
<i>Flash</i>	-
<i>Urban</i>	✓
<b>High Wind</b>	✓
<b>Extreme Heat</b>	✓
<b>Hurricane and Tropical Storms</b>	
<i>Nor'easter</i>	✓
<i>Storm Surge</i>	-

<b>Natural Hazards Identified by the State</b>	<b>Identified by the HMPC</b>
Extreme Cold	✓
Thunderstorm	
<i>Hail</i>	✓
<i>Lightning</i>	✓
Dam Failure	✓
Fire	
<i>Urban</i>	-
<i>Wildfire</i>	✓
Sea Level Rise	-
Epidemic	-
Drought	✓
Earthquake	✓
Tornado	✓
<b>Human-Caused Hazards</b>	
Cyber Security	-
Chemical Incident	-
Terrorism	-
Biological Incident	-
Radiological Incident	-
Civil Unrest	-
<b>Technological Hazards</b>	
Infrastructure Failure	-

This Plan will focus primarily on the natural hazards.

During the beginning phases of the planning process, the Hazard Mitigation Planning Committee participated in an exercise that captured the frequency of various hazards, their potential damage extent, and their impacts (i.e. to populations, infrastructure, natural environment, etc.). The following scales were used during the analysis:

#### **Probability of Future Occurrence/Frequency**

**Highly likely:** near 100% probability within the next year;

**Likely:** between 10% and 100% probability within the next year or at least one chance in next 10 years;

**Possible:** between 1% and 10% probability within the next year or at least one chance in next 100 years;

**Unlikely:** less than 1% probability in next 100 years

Impact
<b>Low:</b> some local property damage not town wide, minor injuries/ loss of life
<b>Medium:</b> 50% of property could be damaged and possible injuries/ loss of life
<b>High:</b> major town-wide property damage, injuries and loss of life

Level of Concern/Risk Rank
Developed by the HMPC to rank the various hazards based on frequency and damage potential.
<b>Low</b> - Not expected to occur with any frequency, damages will be limited.
<b>Medium</b> - Will occur within the next 10 years but the Town has resources to reduce risks.
<b>High</b> - Expected to occur within the next 5 years, and is a major concern for the Town.

Based on a combination of frequency, damage extent and impacts, the team assigned each hazard a Level of Concern. The table below summarizes the hazards of concern for the Town of Foster, ranked from a high concern to low concern

**Table 6 Hazards Ranked**

Hazard	Level of Concern/Risk Rank
High Winds	<b>High</b>
Nor'easter	<b>High</b>
Hurricane	<b>High</b>
Winter Storm (Snow Loads)	<b>High</b>
Ice Storm	<b>High</b>
Drought	<b>Medium</b>
Brushfire	<b>Medium</b>
Extreme Heat and Cold	<b>Medium</b>
Lightning	<b>Medium</b>
Flooding (Street)	<b>Medium/Low</b>
Flooding (Riverine)	<b>Low</b>
Dam Failure	<b>Low</b>
Hail	<b>Low</b>
Tornadoes	<b>Low</b>
Earthquake	<b>Low</b>

The following sub-sections are organized by the level of risk as identified in the table above.

## High Winds

### Description

Wind is the movement of air caused by a difference in pressure from one place to another. Local wind systems are created by the immediate geographic features in a given area such as mountains, valleys, or large bodies of water. National climatic events such as high gale winds, tropical storms, thunderstorms, Nor'easters,

hurricanes, and low-pressure systems produce wind events in Rhode Island. Wind effects can include blowing debris, interruptions in elevated power and communications utilities, and intensification of the effects of other hazards related to winter weather and severe storms.

The Beaufort Wind Scale is a 17-level scale used to describe wind speed and observed wind conditions at sea and on land. A wind classification of 0 has wind speeds of less than 1 mile per hour are considered calm. On the other end, a classification of 10 with wind speeds reaching 63 miles an hour can blow down trees and cause considerable damage.

**Figure 4 Beaufort Wind Chart**

**Beaufort Wind Chart – Estimating Winds Speeds**

Beaufort Number	MPH		Terminology	Description
	Range	Average		
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	Severe gale	Light structure damage.
10	55-63	60	Storm	Trees uprooted. Considerable structural damage.
11	64-73	70	Violent storm	Widespread structural damage.
12	74-95	90	Hurricane	Considerable and widespread damage to structures.

**Location**

Wind events are expected throughout the year in Foster.

**Probability of Future Occurrence**

Highly likely.

**Extent**

Wind speeds in nearby Providence are indicative of Foster (more local data unavailable). “With an average wind speed of 9.3 MPH, Providence is a windy city, 1.00 MPH higher than the national average. The average wind speed in Providence is

about the same as the State average. The windiest season in Providence is spring, with spring wind speeds reaching 10.27 mph on average, 1.17 mph higher than in the rest of the U.S..<sup>7</sup>

**Impact**

Strong wind gusts of 40 miles an hour (Beaufort Scale of 8) can blow twigs and small branches from trees. Occasional gusts and sustained winds at this speed (and above) are of concern to the Town. Damages from wind events range from power outages, property damage to vehicles and buildings and fallen trees/limbs. Wind events in Foster have resulted primarily in power outages and downed tree limbs on local and State roads with minimal property damage. It is important that the Town of Foster maintain their public tree trimming program that will reduce the likelihood of fallen trees/limbs from disrupting transportation routes and/or taking down power lines.

**Climate Change Impacts**

Wind speeds are expected to decrease. “Oceanographers at the University of Rhode Island have analyzed long-term data from several anemometers in southern New England and found that average wind speeds have declined by about 15 percent at inland sites while speeds have remained steady at an offshore site.”<sup>8</sup>

**History<sup>9</sup>**

Foster experiences high wind events annually.

**Table 7 History of High Wind Events in Providence County (more local data unavailable)**

Date	Magnitude (kts)	Comments
09/11/2002	43-45	Downed power lines lit a brush fire along Route 104 in Smithfield and trees blocked a road in Warwick. In Providence, a tree fell on a vehicle and branches fell onto a house. About four thousand electric customers lost power in Johnston and Glocester. Falling trees caused damage to a car and two homes in Johnston. Many trees were reported downed by the high winds in Coventry near the Scituate line.
10/15/2003	47-50	High winds downed trees and large limbs causing scattered power outages.
11/13/2003	50-52	Peak wind gusts of 50-60mph brought down trees and power lines causing fifty thousand in total damages.
11/5/2004	50	Brought down large tree in Woonsocket, highs of 60 mph in northern Providence County.

7 WeatherDB <https://wind-speed.weatherdb.com/l/206/Providence-Rhode-Island> accessed 3/3/2017.

8 University of Rhode Island, 2012. Wind speeds in southern New England declining inland, remaining steady on coast: Climate change, urbanization among possible causes. <https://www.sciencedaily.com/releases/2012/12/121205091044.htm>.

9 NOAA Storm Event Database



<b>Date</b>	<b>Magnitude (kts)</b>	<b>Comments</b>
12/1/2004	58	There were many reports of downed trees and power lines, especially in the higher elevations.
12/23/2004	55-58	Gusts estimated near 60mph brought down trees and wires in Providence, Smithfield, and Johnston. No reports of injuries.
04/02/2005	50-53	Several trees were blown down in Foster and Burrillville, no reports of injuries.
05/07/2005	50	Strong coastal storm brought high winds to parts of Rhode Island, more confined to the higher elevations of Providence County.
10/16/2005	58-60	Multiple trees, limbs, and wires were reported down in Cumberland, Woonsocket, Johnston, and East Providence.
10/25/2005	58	Strong winds knocked a large tree down on interstate 95, partially blocking the northbound side of the interstate. In addition, several trees, wires, and limbs were reported down in Woonsocket, West Greenwich, Exeter, and Tiverton.
10/29/2006	50	Radio operators and the media reported several instances of downed trees and large branches in nearby Woonsocket and Cumberland, one of which temporarily shut down a roadway.
12/01/2006	50-55	High tension wires and trees were brought down. One person was injured in Foster when a tree fell on Barlow Trail.
02/10/2008	58-60	Winds gusted as high as 67 mph in nearby Woonsocket, Rhode Island and downed tree limbs and wires across much of Rhode Island.
01/25/2010	52	A weather station at a spotter's home recorded a wind gust of 60 mph (52kts). This resulted in strong to damaging winds across much of eastern Massachusetts and Rhode Island.
12/08/2011	55	Low pressure off the mid-Atlantic states moved up the coast passing southeast of Southern New England. This produced heavy rainfall and strong to damaging winds across much of the area.
10/29/2012	42-45	The NWS Cooperative Weather Observer in North Foster reported wind gusts to 51 mph. The general public reported sustained wind speeds of 48 mph. Various trees and power lines were brought down.
01/31/2013	56	The media reported gusts to 51 mph in nearby Woonsocket. In nearby Glocester, a tree was downed across Snake Hill Road
11/27/2013	40	Strong wind. Damage to trees. A tree was downed onto Howard Hill Road in Foster.
04/04/2015	41	Strong wind. A tree fell on wires on North Road in Foster.
02/25/2016	50	A tree on Luther Road was downed by thunderstorm winds.
03/17/2016	40	Strong Wind. A tree and wires were downed, snapping a utility pole in half in Foster.
03/31/2016	40	Strong Wind. A tree and wires on Windsor Road were downed in Foster.
08/12/2016	50	Several trees were downed on Route 6 in Foster by thunderstorm winds.
09/5/2016	40	Lingering effects of Hermine were especially damaging to leaf-on trees. Winds generally below tropical storm force.
01/24/2017	40	Strong Wind. Telephone pole and wires down in Foster.
10/29/2017	52	Regionwide power outages after a strong storm came through the area. There was extensive tree damage and power lines downed by fallen branches.
12/09/2017	unknown	Strong windstorm knocked out power for 5 days in parts of town.

## **Nor'easter**

### **Description**

A strong low pressures system along the Mid-Atlantic and New England, can form over land or over coastal waters. The storm radius is often as large as 1,000 miles, and the horizontal storm speed is about 25 miles per hour, traveling up the eastern United States coast. Sustained wind speeds of 10-40 mph are common during a nor'easter, with short term wind speeds gusting up to 70 mph. Typically a winter weather event, Nor'easters are known to produce heavy snow, rain and heavy waves along the coast. Unlike hurricanes and tropical storms, nor'easters can sit off shore, wreaking damage for days.

Also called East Coast Winter Storms, Nor'easters are characterized by:

- › A closed circulation.
- › Located within the quadrilateral bounded at 45N by 65W and 70W, and at 30N by 85W and 75W.
- › Show a general movement from the south-southwest to the north-northeast.
- › Contain winds greater than 23 mph.
- › The above conditions must persist for at least a 12-hour period<sup>10</sup>.

The magnitude or severity of a severe winter storm or Nor'easter depends on several factors including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and time of occurrence during the day (e.g., weekday versus weekend) and time of season.

The extent of a severe winter storm (including Nor'easters that produce snow) can be classified by meteorological measurements and by evaluating its combined impacts. For measuring wind effects, the Beaufort Wind Scale is a system that relates wind speed to observed conditions at sea or on land. (See Table 8). The snow impact of a Nor'easter can be measured using NOAA's Regional Snowfall Index (See Section 3.1.7 Snow Storm).

### **Location**

The Town's proximity to the Atlantic Ocean renders it susceptible to Nor'easters and the resulting loss of human life and property.

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<sup>10</sup> Hersher, et al. An East Coast Winter Storm Climatology. Northeast Regional Climate Center, Cornell University, Ithaca, NY, 2001.

**Probability of Future Occurrence**

Likely

**Extent**

On average, Foster experiences or is threatened by a Nor’easter every couple of years.

**Impact**

Foster is an inland community; most damage would be from downed power lines, downed trees, and damage to mobile homes or older structures. The Blizzard of 1978 was the largest Nor’easter on record. Many people were without heat, food, and electricity for over a week.

**Climate Change Impacts**

Similar to hurricanes, changes in air and water temperatures will lead to stronger Nor’easters along the Atlantic Ocean. Foster should expect stronger Nor’easters, but not necessarily more frequent storms.

**History**

**Table 8 Nor'easter History**

Date	Comments
02/10/1969	Up to 20 inches of snow in parts of Rhode Island.
02/07/1978	27 inches of snow in Providence. State of emergency declared in RI and in surrounding MA and CT.
05/25/2005	Late season Nor’easter brought strong winds and heavy rains, some gusts as high as 60 mph.
02/12/2006	Heavy snow (9.4 inches at T.F. Green) and windy conditions.
10/29/2011	A rare and historic October Nor’easter brought very heavy snow to portions of southern New England on Saturday October 29. Low pressure tracked northeast from the North Carolina coast Saturday morning, rapidly strengthening as it passed well south of Nantucket Saturday evening. As the storm intensified, colder air from aloft was drawn into New England resulting in heavy snow in the interior. 3-6 inches of snow fell across northwestern Providence County.
02/08/2015	Long duration snow storm that dumped 6-16 inches of snow in northwestern Providence County.
03/14/2017	Heavy wet snow followed by plunging temps hampered roads. 11.5 inches of snow reported in North Foster.

## **Hurricanes (Tropical Cyclones)**

### **Description**

Tropical cyclones, a general term for tropical storms and hurricanes, are low pressure systems that usually form over the tropics. These storms are referred to as “cyclones” due to their rotation. Tropical cyclones are among the most powerful and destructive meteorological systems on earth. Their destructive phenomena include very high winds, heavy rain, lightning, tornadoes, and storm surge. As tropical storms move inland, they can cause severe flooding, downed trees and power lines, and structural damage (State of Rhode Island Hazard Identification and Risk Assessment 2016).

There are three categories of tropical cyclones:

1. Tropical Depression: maximum sustained surface wind speed is less than 39 mph
2. Tropical Storm: maximum sustained surface wind speed from 39-73 mph
3. Hurricane: maximum sustained surface wind speed exceeds 73 mph

Once a tropical cyclone no longer has tropical characteristics it is classified as an extratropical system (State of Rhode Island Hazard Identification and Risk Assessment 2016).

Most Atlantic tropical cyclones begin as atmospheric “easterly waves” that propagate off the coast of Africa and cross the tropical North Atlantic and Caribbean Sea. When a storm starts to move toward the north, it begins to leave the area where the easterly trade winds prevail and enters the temperate latitudes where the westerly winds dominate. This situation produces the eastward curving pattern of most tropical storms that pass through the Mid-Atlantic region. When the westerly steering winds are strong, it is easier to predict where a hurricane will go. When the steering winds become weak, the storm follows an erratic path that makes forecasting very difficult (State of Rhode Island Hazard Identification and Risk Assessment 2016).

Hurricanes are categorized according to the Saffir/Simpson scale (Table 8) with ratings determined by wind speed and central barometric pressure. Hurricane categories range from one (1) through five (5), with Category 5 being the strongest (winds greater than 155 mph). A hurricane watch is issued when hurricane conditions could occur within the next 36 hours. A hurricane warning indicates that sustained winds of at least 74 mph are expected within 24 hours or sooner (State of Rhode Island Hazard Identification and Risk Assessment 2016).

The Saffir-Simpson scale below is based primarily on wind speeds and includes estimates of barometric pressure and storm surge associated with each of the five categories. It is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall.”

**Table 9 Saffir/Simpson Hurricane Wind Scale<sup>11</sup>**

<b>Wind Speed</b>	<b>Typical Effects</b>
<b>Category 1 – Weak</b> 74-95 MPH (64-82kt)	Minimal Damage: Damage is primarily to shrubbery, trees, foliage, and unanchored mobile homes. No real damage occurs in building structures. Some damage is done to poorly constructed signs.
<b>Category 2 – Moderate</b> 96-110 MPH (83-95kt)	Moderate Damage: Considerable damage is done to shrubbery and tree foliage; some trees are blown down. Major structural damage occurs to exposed mobile homes. Extensive damage occurs to poorly constructed signs. Some damage is done to roofing materials, windows, and doors; no major damage occurs to the building integrity of structures.
<b>Category 3 – Strong</b> 111-130 MPH (96-113kt)	Extensive damage: Foliage torn from trees and shrubbery; large trees blown down. Practically all poorly constructed signs are blown down. Some damage to roofing materials of buildings occurs, with some window and door damage. Some structural damage occurs to small buildings, residences and utility buildings. Mobile homes are destroyed. There is a minor amount of failure of curtain walls (in framed buildings).
<b>Category 4 – Very Strong</b> 131-155 MPH (114-135kt)	Extreme Damage: Shrubs and trees are blown down; all signs are down. Extensive roofing material and window and door damage occurs. Complete failure of roofs on many small residences occurs, and there is complete destruction of mobile homes. Some curtain walls experience failure.
<b>Category 5 – Devastating</b> Greater than 155 MPH (135kt)	Catastrophic Damage: Shrubs and trees are blown down; all signs are down. Considerable damage to roofs of buildings. Very severe and extensive window and door damage occurs. Complete failure of roof structures occurs on many residences and industrial buildings, and extensive shattering of glass in windows and doors occurs. Some complete buildings fail. Small buildings are overturned or blown away. Complete destruction of mobile homes occurs.

Storm surge is the abnormal rise in water level caused by the wind and pressure forces of a hurricane or nor'easter (State of Rhode Island Hazard Identification and Risk Assessment 2016). Nationally, storm surge flooding has caused billions of

<sup>11</sup> Source: National Weather Service, National Hurricane Center

dollars in damage and hundreds of deaths. Given today's ever-increasing population densities in coastal states, the need for information about the potential for flooding from storm surge has become even more important. Further discussion on storm surge is not included in this plan, due to Foster's inland location over 18 miles from the Providence River at the upper part of Narragansett Bay.

Local damage after Hurricane Irene in August 2011 mainly included down trees and power lines.

### **Location**

The Town's relative proximity to the Atlantic Ocean renders it particularly susceptible to hurricanes and the resulting loss of human life and property.

### **Probability of Future Occurrence**

Likely.

### **Extent**

Hurricanes that likely make it up to Rhode Island are usually weak (Category 1) or downgraded tropical systems. The wind speeds may be less, but the storms can still bring a lot of rain.

### **Impact**

Foster is an inland community; most damage would be from downed power lines, downed trees, and damage to mobile homes or older structures.

### **Climate Change Impacts**

Increasing air and water temperatures will lead to stronger hurricanes along the Atlantic Ocean. It is uncertain if changing climatic conditions will affect the storm tracks, allowing for more storms to head towards Rhode Island. Foster should expect stronger hurricanes, but not necessarily more frequent hurricanes.

### **History**

The wind and rain that precede a hurricane can cause severe damage even to those communities that are further inland, such as Foster. Therefore, the threat of a hurricane to this community and the resulting wind and rain damage need to be considered.

The unforeseen Great New England Hurricane of 1938 is the most catastrophic weather event in Rhode Island and history. The event occurred slightly before high tide and brought with it winds upward of 120 mph. A tidal surge inundated the city of Providence with over 10' of water.

A Category 1 hurricane struck Rhode Island in August 1954 (Carol). The hurricane resulted in house and tree damage around Foster.

In October 1991, Hurricane Bob hit Rhode Island as a Category 2 storm. The hurricane damaged business and homes as well as took down numerous trees and utility lines in Foster. The highest amount of rainfall was 7.01 inches in Foster, RI.<sup>12</sup>

In 2011, Hurricane Irene hit Rhode Island as a tropical storm. Despite the relatively low wind speeds, sustained winds over a 6 to 12-hour long duration resulted in widespread tree damage and resulted in power outages to roughly half a million customers throughout the state. Numerous trees, poles, and wires were downed throughout the state. Wind gusts of 52 knots were observed locally. Collective effects throughout Massachusetts and Rhode Island resulted in 1 fatality, no injuries, and \$127.3 million in property damage (NOAA).

In October 2012, Hurricane Sandy severely impacted coastal Rhode Island as it came ashore with Tropical Storm strength winds. Peak wind speeds in Foster were 65-69 mph. Being inland, Foster was spared the storm surge but suffered minor damage throughout the town due to high winds and rain. There were widespread power outages and a backlog of requests for downed tree removal which restricted access to roads and private property.

## **Snow Storm**

### **Description**

The majority of Rhode Island lies outside the heavy snow and ice regions of the northeast. Due to its maritime climate, Rhode Island generally experiences cooler summers and warmer winters than inland areas. However, snow does occur and can be more than an inconvenience and cause extensive damage. The two major threats from heavy snow are stranded populations and snow loading on rooftops. Additionally, loss of power could mean loss of heat for many residents.

Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three categories of winter storms. A blizzard is the most dangerous of the winter storms. It consists of low temperatures, heavy snowfall, and winds of at least 35 miles per hour. A heavy snowstorm is one which drops four or more inches of snow in a twelve-hour period.

### **Location**

All of Foster is susceptible to snow storms. Roads and trees will be the most affected.

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<sup>12</sup> RI Hurricanes and Climate Change <https://rihurricanesandclimatechange.weebly.com/historic-ri-hurricanes.html>

**Probability of Future Occurrence**

Highly Likely

**Extent**

The Regional Snowfall Index (RSI) is a scale that uses the area of snowfall, the amount of snowfall, and the number of affected people to rank high-impact storms.<sup>13</sup>

On average, Foster receives 57 inches of snow throughout the year. The average winter temperature in Foster is 37 degrees Fahrenheit.<sup>14</sup>

**NOAA’s RSI Scale**

CATEGORY	RSI VALUE	DESCRIPTION
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	18.0+	Extreme

**Impact**

Heavy snow can cause damage to private and public buildings, and strand motorists. During a heavy snow storm, the Town may activate their shelters for people without power. Although expected to occur more frequently, snow is expected to have a less crippling effect on the town than an ice storm.

**Climate Change Impacts**

Warming temperatures will mean less moisture falls as snowfall. Rising temperatures will melt snow earlier in the spring. Foster should experience fewer heavy snow events.

**History**

Foster has been subjected to annual snowstorms. The Great Blizzard of 1978 closed businesses throughout the state for several days.

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13 NOAA Regional Snowfall Index <https://www.ncdc.noaa.gov/snow-and-ice/rsi/>

14 <https://www.usclimatedata.com/climate/foster/rhode-island/united-states/usri0069>



**Table 10 History of Significant Snow Events in Providence County**

<b>Date</b>	<b>Inches</b>	<b>Comments</b>
02/18/2000	7-8	Some snowfall totals from the storm include 8 inches in Smithfield; 7 inches in Burrillville and North Kingstown; and 6 inches in downtown Providence, Warwick, Woonsocket, Cranston, and Hopkinton. Dozens of accidents were reported, many due to excessive speed.
12/30/2000	6-9	The season's first winter storm dumped 6 to 9 inches of snow in western Kent and northwest Providence Counties. Since the storm occurred on a Saturday, no major problems with travel were noted.
01/20/2001	7-8	Since the storm occurred over the weekend, impact on travel was kept to a minimum, but there were still several minor accidents throughout the state.
03/05/2001	6-10	Schools and businesses were shut down for three days in some communities; North Foster had 16 inches of snow.
12/25/2002	4-7	The weight of the snow, combined with strong northeast winds, brought down tree limbs and power lines. North Foster received 6 inches.
02/07/2003	7-13	No significant storm damage was reported, mainly due to the fluffy, light nature of the snow as temperatures fell into the teens and 20s during the height of the storm. North Foster reported totals of 12 inches.
02/17/2003	14-22	Snowfall totals of one to two feet were widely observed throughout Rhode Island. No significant damage was reported due to the storm, primarily since the snow was fluffy and light with temperatures in the teens and 20s.
12/05/2003	10-20	Two deaths were indirectly attributed to the storm. One man was killed when the inner tube he was riding in, towed behind a truck, hit a utility pole. Another man was killed when he was hit by a train while crossing the tracks on a snowmobile in Exeter. North Foster reported 21 inches.
12/26/2004	6-10	There were dozens of reports of accidents due to the combination of slick roads and poor visibility. North Foster totaled 7 inches.
02/24/2005	5-8	Snowfall totals averaged 5 to 8 inches throughout the Ocean State, with locally as much as 7 inches in North Foster.
03/01/2005	4-8	Heavy snow and gusty winds affected Rhode Island and all of southern New England, as low pressure reformed off the mid-Atlantic coast and tracked southeast of the region. Snowfall totals of 4 to 8 inches were widely observed.
03/12/2005	7-9	Dozens of minor accidents and spinouts were reported, but no major problems occurred.
02/14/2007	2-4	Although snowfall totals only averaged 2 to 4 inches, this was the season's first winter storm, and the combination of snow and ice resulted in hazardous travel conditions.
03/16/2007	7-8	This winter storm brought heavy snow and sleet to interior sections of Rhode Island with totals of 4 to 7 inches, before an eventual change to sleet, freezing rain, and then rain. North Foster received around 8 inches.
01/14/2008	5-6	Heavy snow fell across northern Rhode Island, downing trees and power lines.
12/19/2008	10-12	Ten to twelve inches of snow fell across northwestern Providence County.
12/31/2008	6-10	Numerous reports of six to ten inches of snow were received.
01/18/2009	6-7	A low-pressure system in the Great Lakes redeveloped south of New England, spreading snow across the area. Six to seven inches of snow fell across northwestern Providence County.

<b>Date</b>	<b>Inches</b>	<b>Comments</b>
03/02/2009	5-10	This late season storm affected most of the east coast and resulted in hundreds of flight cancellations at Boston's Logan Airport and many car accidents.
12/19/2009	14-19	Fourteen to nineteen inches of snow fell across northwest Providence County.
12/26/2010	8-15	A strengthening winter storm passed southeast of Nantucket and brought heavy snow and strong winds to much of Rhode Island, resulting in near blizzard conditions at times.
01/12/2011	18-22	A developing nor'easter coastal storm dumped nearly two feet of snow across portions of Rhode Island in a 24-hour period.
02/01/2011	6-8	A total of six to eight inches of snow fell across Northwest Providence County over the two-day period, with upwards of a tenth of an inch of ice accumulation for isolated locations falling during the morning period on the 2nd.
12/29/2012	8-13	Snowfall totals between eight and thirteen inches were reported in northwest Providence County.
02/08/2013	21-28	An historic winter storm deposited tremendous amounts of snow over all of southern New England, mainly from the mid-afternoon on Friday, February 8 and lasting into the daylight hours of Saturday, February 9. Most locations received 2 to 2.5 feet of snow! Isolated thunderstorms were common across the entire region during the height of the storm.
03/07/2013	5-12	This storm brought heavy snow and significant coastal flooding to the forecast area.
12/14/2013	4-8	Four to eight inches of snow fell across northwestern Providence County.
01/02/2014	7-8	Seven to eight inches of snow fell across northwestern Providence County.
01/21/2014	10-12	Low pressure tracked along an arctic front bringing heavy snow and strong winds to much of southern New England.
02/05/2014	5-10	This spread heavy snow across all of southern New England. Five to ten inches of snow fell across northwestern Providence County.
02/13/2014	6-10	A significant winter storm brought six to twelve inches of snow across much of southern New England. Lesser amounts fell east of the Interstate 95 corridor where snow changed to rain.
01/26/2015	24-30	The highest snowfall totals, averaging two to three feet, extended from extreme northeast Connecticut and northwest Rhode Island into much of central and northeast Massachusetts, including greater Boston.
02/02/2015	3-13	Three to thirteen inches of snow fell across northwestern Providence County.
02/08/2015	10-16	Resulted in a long duration snow storm that dumped up to a foot and a half of snow across southern New England.
02/14/2015	8-13	Eight to thirteen inches of snow fell across northwestern Providence County. A 56-year-old female custodian was injured when she fell through a skylight while clearing the snow from the roof of Smithfield High School on February 18th.
01/23/2016	5-8	In addition, strong, damaging winds accompanied the snow. Five to eight inches of snow fell across northwestern Providence County.
02/05/2016	6-12	This snow was extraordinarily wet and heavy, bringing down trees and wires across portions of southern New England.

Date	Inches	Comments
02/08/2016	6-9	Six to nine inches of snow fell across northwestern Providence County.
04/04/2016	4-7	Four to seven inches of snow fell across northwestern Providence County.
01/07/2017	8-11	Eight to eleven inches of snow fell on Northwest Providence County during the day and evening.
02/09/2017	10-15	Coastal low pressure developed off the Mid Atlantic coast and passed southeast of New England bringing strong winds and heavy snow.
03/14/2017	7-13	In Rhode Island, snowfall amounts were highest in the northwest hills, where a changeover to sleet and rain did not happen until late in the afternoon. North Foster reported roughly 11.5 inches.

Source: National Climate Data Center (2017)

## Ice Storm

### Description

An ice storm occurs when moisture falls and freezes immediately upon impact. The term ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations.

Freezing rain most commonly occurs in a narrow band within a winter storm that is also producing heavy amounts of snow and sleet in other locations. If extreme cold conditions are combined with low or no snow cover, the cold can

better penetrate downward through the ground and potentially create problems for underground infrastructure, as well. When utilities are affected, and heating systems are compromised or do not work, water and wastewater pipes can freeze and even rupture.



Ice Storm. Source: NOAA.

### Location

All of Foster is susceptible to ice storms.

### Probability of Future Occurrence

Highly Likely.

### Extent

Ice storms can be the most devastating winter weather phenomena and are often the cause of automobile accidents, power and communication system outages, personal injury, and death. Moreover, they can hinder the delivery of emergency

services needed in response to these catastrophes and endanger the responders. Ice storms accompanied by wind gusts cause the most damage.

The Sperry–Piltz Ice Accumulation (SPIA) Index is a scale for rating ice storm intensity, based on the expected storm size, ice accumulation, and damages on structures, especially exposed overhead utility systems. The SPIA Index uses forecast information to rate an upcoming ice storm's impact from 0 (little impact) to 5 (catastrophic damage to exposed utility systems).

Foster expects at least a level 1- isolated or localized utility interruptions every year due to ice.

**Figure 5 SPIA Index**

**The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009**

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) <small>* Revised-October, 2011</small>	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
<b>0</b>	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
<b>1</b>	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
<b>2</b>	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
<b>3</b>	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
<b>4</b>	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
<b>5</b>	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

## Impact

The Foster Hazard Mitigation Plan Committee is most concerned about ice taking down trees throughout the heavily forested town. Falling trees have taken out power lines, damaged buildings, and essentially shut down the town. Without power, many residents can't run their wells for drinking water. Icy roads can also cause dangerous driving conditions.

## Climate Change Impacts

Warming temperatures will mean less snowfall but if there is enough moisture in the atmosphere, it may fall as freezing rain, coating everything in ice. Foster should expect more ice events.

## History

Due to the unique weather in New England, ice storms are usually part of larger snow events. The winter storm event that crippled the state in February 1978 did include a FEMA disaster declaration for snow and ice. Subsequent storms have included ice warnings when there are rapidly warming and cooling temperatures. Rhode Island was spared the brunt of the 2008 ice storm which affected more than a million people across New Hampshire, Vermont, Massachusetts, Maine, Connecticut, and New York.

## Drought

### Description

Drought is characterized as a continuous period of time in which rainfall is significantly below the norm for a particular area over a multi-year period. The American Meteorology Society defines drought as a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance. Drought differs from other natural hazards in that they occur suddenly. Rather, a drought evolves over months or even years and, while causing very little structural damage, can have profound economic, environmental, and social impacts.



Drought in nearby Connecticut.  
Source: Bob Luckey Jr./ Hearst Connecticut Media

There are four different ways that a drought can be defined:

1. Meteorological – A measure of departure of precipitation from normal. Due to climatic differences, what is considered a drought in one location may not be a drought in another location.

2. Agricultural – refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.
3. Hydrological- occurs when surface and subsurface water supplies are below normal.
4. Socioeconomic- refers to the situation that occurs when physical water shortage begins to effect people.

Characteristics and impacts of drought differ in many ways, so it is difficult to quantify drought. An existing index called the Palmer Drought Severity Index (PDSI) that used temperature and precipitation levels to determine dryness, measuring a departure from the normal rainfall in a given area. The advantage of the PDSI is that it is standardized to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions. A monthly PDSI value below -2.0 indicates moderate drought, and a value below -3.0 indicates severe drought.

The U.S. Drought Monitor tracks drought conditions in Rhode Island and in the rest of the nation. They create maps based on climate data, hydrologic and soil conditions, as well as reported impacts and observations from over 350 contributors nationwide.

**Table 11 Drought Severity** <sup>15</sup>

Severity	PDSI Index Value	Drought Level	Possible Impacts
Exceptional Drought	-5 or less	Emergency	Widespread crop/pasture losses, shortages of water creating water emergencies
Extreme Drought	-4 to -4.9	Warning	Major crop/pasture losses, widespread water shortages or restrictions
Severe Drought	-3 to -3.9	Watch	Crop or pasture losses likely, water shortages common, water restrictions imposed
Moderate Drought	-2 to -2.9	Advisory	Some damage to crops/pastures, developing water shortages, voluntary water-use restrictions requested
Mild Drought/ Abnormally Dry	-1 to -1.9	Normal	Short term dryness slowing planting or crop growth
Incipient Dry Spell	-0.9 or less	-	-

Rhode Island, as with most states within the United States, uses both the Palmer Drought Severity Index (PDSI) and the Crop Moisture Index (CMI) as indices for a

<sup>15</sup> <http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx>

drought occurrence. The CMI (a derivative of the PDSI) provides information on the short-term or current status of purely agricultural drought or moisture surplus. The PDSI is most effective for determining long-term drought conditions, while the CMI is effective at helping determine short-term drought.

The RI Drought Steering Committee assigns drought levels for the seven designated drought regions in the state, based on hydrological indices such as precipitation, groundwater, stream flow, and the PDSI, as well as on local supply indices such as static groundwater levels and reservoir levels. The Normal, Advisory, and Watch levels are issued statewide. The Warning and Emergency levels are issued on a regional basis and consider local conditions, source of water supply, and water storage capacity issues.

### **Location**

According to the Rhode Island Water Resource Board the potential for a drought exists every eleven years in Rhode Island. Although temporary drought conditions may occasionally exist in Rhode Island, affecting Foster devastatingly, long term drought conditions are not indicative of this temperate region.

### **Probability of Future Occurrence**

Likely.

### **Extent**

According to the National Weather Service Rhode Island receives on average 39" to 54" of rain annually. Even though the state receives more rain annually than the average for the United States (29.53 inches), Rhode Island does experience extended periods of dry weather. Some level of meteorological drought, while not frequent, does occur in Foster every couple of years.

### **Impact**

The main impact of meteorological drought is periods of very high fire danger. In addition, small pond levels are reduced, thereby impacting private wells. All Foster residents rely on wells for their drinking water.

Drought conditions have been known to trigger the rapid increase of the gypsy moth populations in the region. The extended period of dry weather (specifically in May and June) slows the fungus that usually keeps the gypsy moth caterpillars at bay. Denuded trees can have cascading effects on the local ecosystem.

### **Climate Change Impacts**

Changes in precipitation patterns may increase the water tables, however, periods of drought may be more intense.

## History

Extended droughts are rare in Rhode Island with a record of six major droughts (those lasting for more than one year) since 1929. The longest and most severe drought occurred in 1963-67 and affected most of the northeast. Water shortages affected most communities in Rhode Island and several municipal-supply wells were drilled to augment declining public supplies.<sup>16</sup>

**Table 12 History of Droughts that Have Affected Foster<sup>17</sup>**

Date	Area Affected	Remarks
1930-31	Statewide	Stream flow of 70% normal.
1941-45	Statewide	Stream flow of 70% normal in Blackstone and Pawtuxet Rivers.
1949-50	Statewide	Stream flow of 70% normal.
1963-67	Statewide	Water restrictions/well replacements common.
1980-81	Statewide	Groundwater deficient in eastern part of state. Considerable crop damage.
1987-88	Southern part of the State	\$25 million crop damage.
1998-99	Statewide	Spring through summer the State experienced 75% of normal flow.
2012	Statewide	January –April 2012. Meteorological drought due to precipitation levels one half of normal.
2016	Statewide	Drought Advisory August through November 2016.

## Brushfire

### Description

Brushfires (smaller versions of wildfires) are fueled by natural cover, including native and non-native species of trees, brush and grasses, and crops along with weather conditions and topography. While available fuel, topography, and weather provide the conditions that allow fires to spread, most fires are caused by people through criminal or accidental misuse of fire.

Brushfires pose serious threats to human safety and property in rural and suburban areas. They can destroy crops, timber resources, recreation areas, and habitat for wildlife. Wildfires are commonly perceived as hazards in the western part of the

<sup>16</sup> USGS Floods and Droughts <https://md.water.usgs.gov/publications/wsp-2375/ri/>

<sup>17</sup> National Climate Data Center (2017).



country; however, brushfires are a growing problem in the wildland/urban interface of the eastern United States, including Rhode Island.

Brushfires are dependent upon the quantity and quality of available fuels. Fuel quantity is the mass per unit area. Fuel quality is determined by a number of factors, including fuel density, chemistry, and arrangement. Arrangement influences the availability of oxygen. Another important aspect of fuel quality is the total surface exposed to heat and air. Fuels with large area-to-volume ratios, such as grasses, leaves, bark and twigs, are easily ignited when dry.

Climatic and meteorological conditions that influence wildfires include solar insolation, atmospheric humidity, and precipitation, all of which determine the moisture content of wood and leaf litter. Dry spells, heat, low humidity, and wind increase the susceptibility of vegetation to fire. In Rhode Island, common factors leading to large fires include short-term drought, humidity below 20%, and fuel type.

Various natural and human agents can be responsible for igniting wildfires. Natural agents include lightning, sparks generated by rocks rolling down a slope, friction produced by branches rubbing together in the wind, and spontaneous combustion.

Human-caused wildfires are typically worse than those caused by natural agents. Arson and accidental fires usually start along roads, trails, streams, or at dwellings that are generally on lower slopes or bottoms of hills and valleys. Nurtured by updrafts, these fires can spread quickly uphill. Arson fires are often set deliberately at times when factors such as wind, temperature, and dryness contribute to the fires' spread.

### **Location**

The forested part of Foster is susceptible to fire.

### **Probability of Future Occurrence**

Highly Likely

### **Extent**

Less than 2 acres are burned annually.

### **Impact**

Individual buildings may be more or less vulnerable to damage from wildfire based on factors such as the clear distance around the structure and the structure's construction materials. Brushfire primarily impacts timber and forest ecosystems, although the threat to nearby buildings is always present. Farmland and animals may also be affected.

## Climate Change Impacts

Changes in precipitation patterns may shorten the dry periods that produce ideal conditions for brushfires. However, periods of drought may be more intense, increasing the fire hazard during the summer.

## History

Foster has experienced 0 substantial brushfires in the past 175 years. In the past year however there have been 2 smaller brushfires totaling less than 2 acres. Within the past five years, there have been similarly sized brushfires totaling 10-20 acres. No further information was recalled by the HMPC.

## Extreme Temperatures

### Description

**Extreme cold** may accompany winter storms, be left in their wake, or can occur without storm activity. Extreme cold can lead to hypothermia and frostbite, which are both serious medical conditions. The definition of an excessively cold temperature varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered “extreme cold.” In Rhode Island, extreme cold usually involves temperatures below zero degrees Fahrenheit (State of Rhode Island Hazard Identification and Risk Assessment 2016).

The wind chill index attempts to quantify the cooling effect of wind with the actual outside air temperature to determine a wind chill temperature that represents how cold people and animals feel, based on the rate of heat loss from exposed skin. A wind chill index of -5 indicates that the effects of wind and temperature on exposed flesh are the same as if the air temperature alone were five (5) degrees below zero (0), even though the actual temperature could be much higher. The NWS issues a wind chill advisory when wind chill temperatures are potentially hazardous and a wind chill warning when the situation can be life-threatening (Rhode Island State Hazard Mitigation Plan 2014).

The National Weather Service issues **extreme (or excessive) heat** warnings when the maximum expected heat index is expected to be 105° F or higher for at least 2 consecutive days and night time air temperatures are not expected to fall below 75°. In the northeast, these criteria are generally modified to a heat index of 92° for higher for 2 consecutive days.



### **Location**

An extreme heat or cold event would be a regional issue affecting Foster and significant portions of Southern New England. Extreme temperatures could have a serious impact on private and public structures, as well as the general population throughout Foster. Those most at risk to extreme temperatures are the elderly and those who work outside.



### **Probability of Future Occurrence**

Highly Likely.

### **Extent**

In 2011, North Central State Airport (14 miles northeast of Foster) reported heat indexes of 105 to 107 over a five-hour period

Wind chills of 32 below zero were reported at North Central State Airport in 2016. At the same location in 2015, wind chills as low as 30 below were reported during a six-hour time frame.

### **Impact**

Personal exposure to dangerous heat conditions may lead to heat cramps, heat exhaustion, and heat stroke. These are especially important to monitor in children, and vulnerable populations that are not able to move to cooler conditions. Agriculture and animals are also stressed by extreme high temperatures

Extreme cold conditions may occur during, after, or without any connection to a winter storm. Exposure to extreme cold can lead to hypothermia and frostbite. Agriculture and animals are also stressed by extreme cold temperatures.

Frost heaves are a concern in Foster where many of the main roads are unpaved. This leads to investing more money in road repair.

### **Climate Change Impacts**

Foster should anticipate more frequent occurrences of extreme heat during the summer.

### **History**

Extreme temperatures are recorded by NOAA and are the most accurate recording of weather in and around Foster. The following table summarizes extreme

temperature events within Providence County. North Central State Airport, located about 14 miles northeast of Foster is the nearest recording station.

**Table 13 History of Extreme Temperatures near Foster, RI<sup>18</sup>**

Date	Temperature (F)	Remarks
From 1950 to present day, first recorded event is in 2011.		
07/22/2011	Heat index 105-107	At nearby North Central State Airport.
02/16/2015	Wind chills - 30 below zero	At nearby North Central State Airport.
02/14/2016	Wind chills - 32 below zero	At nearby North Central State Airport.

## Lightning/Thunderstorms

### Description

Thunderstorms are formed when the right atmospheric conditions combine to provide moisture, lift, and warm unstable air that can rise rapidly. Thunderstorms occur any time of the day and in all months of the year but are most common during summer afternoons and evenings and in conjunction with frontal boundaries. The National Weather Service (NWS) classifies a thunderstorm as severe if it produces hail at least one inch in diameter, winds of 58 MPH or greater, or a tornado. About 10 percent of the estimated 100,000 annual thunderstorms that occur nationwide are considered severe. Thunderstorms affect a smaller area compared with winter storms or hurricanes, but they can be dangerous and destructive for a number of reasons. Storms can form in less than 30 minutes, giving very little warning; they have the potential to produce lightning, hail, tornadoes, powerful straight-line winds, and heavy rains that produce flash flooding.

All thunderstorms contain lightning. Thunderstorms can occur singly, in clusters, or in lines. Therefore, it is possible for several thunderstorms to affect one location in the course of a few hours. Thunderstorms usually bring heavy rains (which can cause flash floods), strong winds, hail, lightning, and tornadoes. Lightning is caused by the attraction between positive and negative charges in the atmosphere, resulting in the buildup and discharge of electrical energy. Lightning is one of the most underrated severe weather hazards, yet ranks as the second-leading weather killer in the United States. "Hundreds of people across the nation are injured annually by lightning, most commonly when they are moving to a safe place but have waited too long to seek shelter. Lightning strike victims often suffer long-term

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18 National Climate Data Center (2017).

effects such as memory loss, sleep disorders, weakness and fatigue, chronic pain, depression and muscle spasms. Lightning has the potential to start both house fires and wildfires. Lightning causes an average of 55-60 fatalities, 400 injuries, and over \$1 billion in insured losses annually nationwide.” Lightning often strikes as far as 10 miles away from any rainfall.

**Location**

All of Foster is susceptible to lightning/thunderstorms.

**Probability of Future Occurrence**

Highly Likely.

**Extent**

There is no universally accepted standard for measuring the strength or magnitude of a lightning storm. Similar to modern tornado characterizations, lightning events are often measured by the damage they produce. Building construction, location, and nearby trees or other tall structures will have a large impact on how vulnerable an individual facility is to a lightning strike. A rough estimate of a structure’s likelihood of being struck by lightning can be calculated using the structure’s ground surface area, height, and striking distance between the downward-moving tip of the stepped leader (negatively charged channel jumping from cloud to earth) and the object. In general, buildings are more likely to be struck by lightning if they are located on high ground or if they have tall protrusions such as steeples or poles which the stepped leader can jump to.

**Impact**

Lightning can strike buildings and accessory structures, often causing structure fires. Electrical and communications utilities are also vulnerable to direct lightning strikes. Damage to these lines has the potential to cause power and communication outages for businesses, residencies, and critical facilities.

**Climate Change Impacts**

Changing weather patterns will lead to more severe thunder and lightning storms.

**History**

There has been no reported loss of human life in Foster in the past 50 years due to lightning.

**Table 14 History of Lightning Strikes in Foster**

Date	Type	Comments
6/7/2001	Strike	Log home in Foster which ignited a fire and completely destroyed the home.
7/28/2006	Thunderstorm winds	Damaging winds associated with thunderstorm brought down trees.
8/12/2016	Strike	Two barns struck- Shippee Schoolhouse Road and Round Hill Road. Both were set on fire. Accompanied by wind damage and flooding.

Source: National Climate Data Center (2017)

## Flooding (Riverine and Urban/Street)

### Description

According to the Rhode Island 2014 Hazard Mitigation Plan Update, “Flooding is a localized hazard that is generally the result of excessive precipitation. Flooding is the most commonly occurring natural hazard, due to the widespread geographical distribution of river valleys and coastal areas, and the attraction of human settlements to these areas. Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss.”

“A flood, which can be slow or fast rising but generally develops over a period of days, is defined by the National Flood Insurance Program (NFIP) as:

- › A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from: overflow of inland or tidal waters; unusual and rapid accumulation or runoff of surface waters from any source; or a mudflow; or
- › The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.”

Severe storms with heavy rain can generate flash floods which strike and end quickly. Flash flooding isn’t limited to streams and rivers but also streets.

Flooding due to runoff occurs when water runs over the land’s surface impervious surfaces (paved areas, building subdivisions, and highways). Two major environmental modifications are primarily responsible for drastically altering the rain fall-runoff relationship.

1. Making the land surface impervious by covering it with pavement and construction work.
2. Installing storm sewer systems that collect urban runoff rapidly discharging large volumes of water into stream networks and/or freshwater wetland system.

FEMA maintains regulatory flood maps called Flood Insurance Rate Maps (FIRM). Insurance companies refer to these when providing coverage to homeowners. These maps are available for viewing at Town Hall and online at The FEMA Map Service Center <https://msc.fema.gov>. Please note that there is a process for the public to request a change in the flood zone designation for their property.

### **Location**

Although crisscrossed by streams, the Town of Foster sits at a relatively high elevation and doesn't normally experience devastating riverine flooding. However, heavy rain events have washed out dirt roads in Foster. Sometimes entire sections are washed out but more often, the shoulders are rutted.

During the March 2010 flood events when there was heavy rain and road flooding, A few bridges were damaged as well as a lot of road washouts. Specific areas which were affected included:

- Tucker Hollow Road- flooding exposed 3 culvert pipes
- Isthmus Road- flooding washed out two of the 3' culvert pipes
- Paved roads were undermined throughout town

### **Probability of Future Occurrence**

Street flooding is highly likely. Riverine flooding is unlikely. Due to climatic changes, it is quite possible that the Town may experience similar flooding events on a more frequent basis.

### **Extent**

Localized flooding can be expected to occur on an annual basis. The flood event which occurred in March 2010 was a 250 year +/- event.

### **Impact**

Heavy rains, quick thaws and precipitation, and hurricanes accompanied by heavy winds and rain make the Town vulnerable to personal, property and environmental damage occasioned by flooding. Furthermore, less than 40% of the roads in town are unpaved, making them more susceptible to washouts.

Flood prone areas and/or areas of concern are:

- › Danielson Pike- bottom of Dolly Cole Hill
- › North Road (dirt) between Boswell and South Killingly- channelized water from private property.
- › Foster Country Club -at parking lot into the road by the pond but drains quickly
- › Salisbury/Balcolm- washout, dirt road issue
- › 94/Foster Center at North Road- grade is higher than road

Vulnerable structures include dams, roads, historic buildings, and electric substations.

The Town of Foster also participates in the National Flood Insurance Program (NFIP). There are 3 policies in an A zone, and 6 policies in the X zone.

There have been 2 paid losses since 1978, which paid out \$35,025 to policyholders. Currently there are no Repetitive Loss properties in the Town of Foster. A Repetitive Loss property is defined as an insurable building for which two or more claims of more than \$1,000 were paid out by the NFIP within a 10-year period.

**Climate Change Impacts**

Heavier, more frequent precipitation events may cause more riverine flooding and flash flooding events in Foster.

**History**

**Table 15 History of Significant Flooding in Foster Since 2000**

Date	Damage	Comments
6/17/2001	N/A	Torrential rainfall associated with the remnants of Tropical Storm Allison resulted in flash flooding throughout Providence County. In Foster, two roads were washed out when runoff carved gulches into the roadways. Storm totals of 3 to 6 inches were common throughout northern Rhode Island, with as much as 7.10 inches in North Smithfield.
3/30/2010	Town-wide	Eight to ten inches of rain in Kent County. River and areal flooding resulted in millions of dollars of damage across Rhode Island, with numerous homes, businesses, and people affected. In Foster the worst damage was local road were washed out and culverts were overtopped.

Source: National Climate Data Center (2017), and Town of Foster

**Dam Failure**

**Description**

Dams are classified as high hazard, significant hazard or low hazard. The classification is not based on whether a dam is deemed safe or unsafe. As of 2016, there are 96 high hazard dams, 81 significant hazard dams and 490 low hazard dams in Rhode Island. Each dam’s hazard classification determines the frequency of inspection. The higher the classification, the more frequently the inspection is conducted.

A *High Hazard* dam is one whose failure or misoperation will result in a probable loss of human life.



A *Significant Hazard* dam is one whose failure or misoperation results in no probable loss of human life but may cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare.

A *Low Hazard* dam is one whose failure or misoperation results in no probable loss of human life and low economic losses.

As part of each Rhode Island Department of Environmental Management (RIDEM) inspection, the major components of the dam are subjectively rated as good, fair or poor. The major components are the embankment, the spillway and the low-level outlet. Good means the dam meets the minimum Army Corps of Engineers (ACOE) guidelines. Fair means the dam has one or more components that require maintenance. Poor means a component of a dam has deteriorated beyond maintenance and is in need of repair.

Flood events call into question the structural integrity of dams that would affect Foster. In addition to the threat of flooding downstream during a dam breach, the Town is also concerned about the dam gate systems. It is suspected that most of the antiquated dam gates may not open properly to let off water, thereby flooding the areas behind the dam.

In 2016, RIDEM identified 26 dams in the Town of Foster. Two (2) of the 26 dams are classified as high hazard dams and one (1) dam is identified as significant hazard dams. The remainder are considered low hazard.

The following summaries set forth the conditions of the three dams that are classified as significant or high hazard dams.

**Location**

Westconnaug Reservoir (**high hazard**)

Spear Pond (**high hazard**)

Gorham, N. Farm Pond (**significant hazard**)

**Probability of Future Occurrence**

Possible

**Extent**

All three dam hazard classifications are represented in Foster. The extent of a failure would vary. The Foster Hazard Mitigation Plan Committee has identified failure as a break in the dam, sending water downstream, or faulty gates which if not opened will cause flooding behind the dam.

**Impact**

The Foster Hazard Mitigation Plan Committee recognizes that a dam failure is not a natural hazard in itself but several of the hazards listed in the hazard list could bring dam failure upon the Town of Foster. Severe winter storms, flooding, and a hurricane could all bring enough rain and or snowfall to cause a dam failure. The age of these

dams also poses a risk to the structural integrity of these dams. A failure of the antiquated gates could cause considerable loss of life, property and economy.

### Climate Change Impacts

Heavier, more frequent precipitation events may cause more riverine flooding and stress the dams in Foster.

### History

None.

### Hail

Hail is formed in towering cumulonimbus clouds (thunderheads) when strong updrafts carry water droplets to a height at which they freeze. Eventually, these ice particles become too heavy for the updraft to hold up, and they fall to the ground at speeds of up to 120 MPH. Hail falls along paths called swaths, which can vary from a few square



acres to up to 10 miles wide and 100 miles long. Hail larger than 0.75 inch in diameter can do great damage to both property and crops, and some storms produce hail over two inches in diameter. Hail causes about \$1 billion in damages annually in the U.S. (State of Rhode Island Hazard Identification and Risk Assessment 2016).

**Table 16 Hail Size**

Hail Diameter	Size Description
1/4"	Pea Size
1/2"	Mothball Size
3/4"	Penny Size
7/8"	Nickel Size
1" (Severe Criteria)	Quarter Size
1 1/4"	Half Dollar Size
1 1/2"	Walnut or Ping Pong Ball Size
1 3/4"	Golf Ball Size
2"	Hen Egg Size
2 1/2"	Tennis Ball Size
2 3/4"	Baseball Size
3"	Teacup Size
4"	Grapefruit Size
4 1/2"	Softball Size

**Location**

All of Foster is susceptible to hail.

**Probability of Future Occurrence**

Highly Likely

**Extent**

Hail in Foster is usually 1 inch or smaller.

**Impact**

Structure vulnerability to hail is determined mainly by construction and exposure. Metal siding and roofing is better able to stand up to the damages of a hailstorm than many other materials, although it may also be damaged by denting. Exposed windows and vehicles are also susceptible to damage. Crops are extremely susceptible to hailstorm damage, as even the smallest hail stones can rip apart unsheltered vegetation.

Human vulnerability is largely determined by the availability and reception of early warnings for the approach of severe storms, and by the availability of nearby shelter. Swimming, boating, and fishing are particularly dangerous during periods of frequent lightning strikes, which can also cause power outages, topple trees, and spark fires. Individuals who immediately seek shelter in a sturdy building or metal-roofed vehicle are much safer than those who remain outdoors. Early warnings of severe storms are also vital for aircraft flying through the area.

**Climate Change Impacts**

There is uncertainty about the effects of climate change on hail storms in Foster. It is likely that the changes in weather patterns may bring more severe hail events.

**History**

**Table 17 History of Significant Hail in Foster**

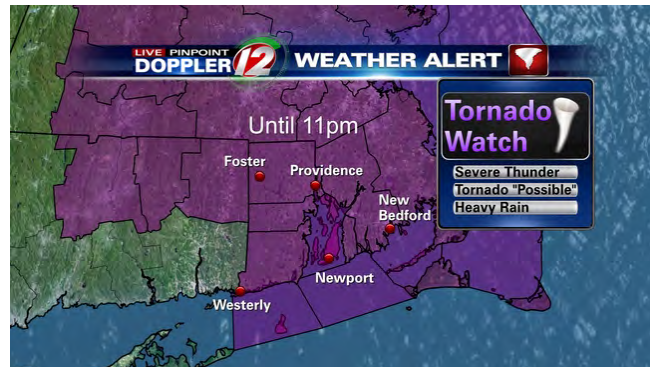
Date	Type	Comments
07/24/2015	3/4" Hail	The cold air aloft resulted in several reports of large hail in addition to some isolated tree damage. Penny size hail fell on East Killingly Road in Foster.

Source: National Climate Data Center (2017)

## Tornadoes

### Description

A tornado is a violent windstorm with a twisting, funnel-shaped cloud. They are often spawned by thunderstorms or hurricanes. Tornadoes are produced when cool air overrides a layer of warm air, forcing the



warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally March through August, although tornadoes can occur at any time of year. Over 80 percent of all tornadoes strike between noon and midnight. During an average year, about 1,000 tornadoes are reported across the United States, resulting in 80 deaths and over 1,500 injuries. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one-mile-wide and 50 miles long.

Tornadoes are categorized according to the damage they produce using the Fujita Scale (F-scale). Below is the Enhanced Fujita (EF) Scale and the Old Fujita (F) Scale. An F0 tornado causes the least amount of damage, while an F5 tornado causes the most amount of damage. Relatively speaking, the size of a tornado is not necessarily an indication of its intensity. On August, 7th, 1986, a rare outbreak of seven tornadoes occurred in New England. One such tornado, rated F2 on the Enhanced Fujita Scale, carved its way through Cranston, RI, and Providence, RI, causing twenty injuries and \$2,500,000 in damages. **Table 18** highlights more tornado events that have affected, Rhode Island.

**Table 18 Enhanced Fujita Scale**

Enhanced Fujita Scale		Damage Scale
EF Number	3 Second Gust (MPH)	
0	65-85	<b>Light damage.</b> Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	86-110	<b>Moderate damage.</b> Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
2	111-135	<b>Considerable damage.</b> Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.

Enhanced Fujita Scale		Damage Scale
EF Number	3 Second Gust (MPH)	
3	136-165	<b>Severe damage.</b> Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
4	166-200	<b>Devastating damage.</b> Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown generating large missiles.
5	Over 200	<b>Incredible damage.</b> Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

**Probability of Future Occurrence**

Unlikely. Tornadoes rarely occur in this region.

**Location**

The HMPC recognizes that the risk of tornadoes is low for the State of Rhode Island and Town of Foster but with the recent changing weather patterns and touchdowns of tornadoes, it would be unjust not to consider them a possible hazard.

**Extent**

All of Foster is susceptible to tornadoes.

**Impact**

Tornadoes could cause significant damage to structures, trees and utility lines. Flying debris could be cause injuries to residents. Mobile homes are generally more vulnerable to damage than steel framed structures. The Town Ordinance does not allow year-round mobile homes but about 10 have been grandfathered. These properties are more susceptible to the threat of a tornado.

**Climate Change Impacts**

It is uncertain how climate change will affect tornado outbreaks in Foster.

## History

**Table 19 Recent Tornado Events in Rhode Island<sup>19</sup>**

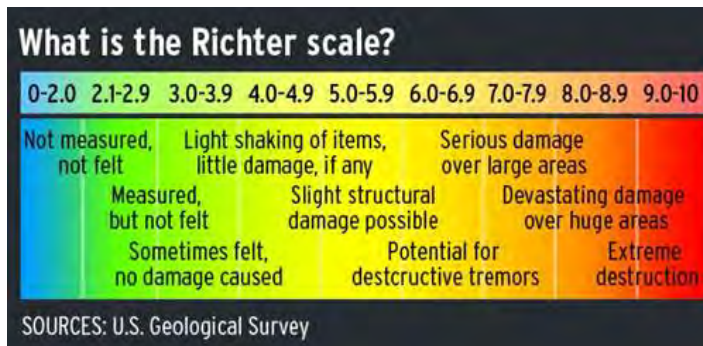
Date	F-Scale	Injuries	Damage	Location
08/16/2000	0	0	\$0	Providence County
08/07/2004	0	0	\$0	Kent County
07/23/2008	1	0	\$47,987	Bristol County
08/10/2012	0	0	\$50,000	Washington County

## Earthquake

### Description

An earthquake (also known as a quake, tremor or temblor) is the result of a sudden release of energy in the Earth's crust that creates seismic waves. The seismicity or seismic activity of an area refers to the frequency, type and size of earthquakes experienced over a period of time. Earthquakes are measured with a seismometer. The size or magnitude is recorded on a device known as a seismograph. Earthquakes with a magnitude 3 or lower are mostly imperceptible (too low to recognize) and magnitude 7 earthquakes cause serious damage over large areas.

**Figure 6: Richter Scale**



Although earthquakes are not considered to be a major problem in the Northeast United States, they are more prevalent than one might expect. **Table 20** presents historical seismic activity for Rhode Island. It highlights the earthquake epicenter, the Richter magnitude at the epicenter, and the Mercalli Intensity Level. Richter magnitudes are technical quantitatively based calculations that measure the amplitude of the largest seismic wave recorded. Richter magnitudes are based on a

<sup>19</sup> Rhode Island Emergency Management Agency (RIEMA), State of Rhode Island Hazard Identification and Risk Assessment 2016. There have been no reported tornadoes in Foster.

logarithmic scale and are commonly scaled from 1 to 8. See the graphic below. The higher the magnitude on the Richter Scale, the more severe the earthquake. Mercalli intensity levels are based on qualitative criteria that use the observations of the people who have experienced the earthquake to estimate the intensity level. The Mercalli scale ranges from I to XII. The higher the intensity level on the scale, the closer the person is to the epicenter.

**Table 20 Mercalli Scale**

<b>Modified Mercalli Intensity</b>	<b>Description of Intensity Level</b>
I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motorcars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level distorted. Objects thrown into the air.

Despite the low probability of a high impact earthquake, physical characteristics in Rhode Island may increase earthquake vulnerability:

- › Hard Rock: Due to the geological makeup of New England's base rock, seismic energy is conducted on a greater scale (four (4)-10 times that of an equivalent Richter magnitude earthquake in California).
- › Soft Soil: Many coastal regions of New England are made up of soft soils. These soils can magnify an earthquake as much as two times.

- › Structures: The New England region, being one (1) of the first settled areas of the United States, has an abundance of older, unreinforced masonry structures that are inherently brittle and very vulnerable to seismic forces.
- › Low Public Awareness of Vulnerability: Little public recognition of earthquake threat, and no established system of educating or informing the public of the threat or how to prepare for or respond during an earthquake. Therefore, higher losses will occur here than in other regions of the country.

### **Location**

Rhode Island is located in the North Atlantic tectonic plate and is in a region of historically low seismicity. Only three (3) or four (4) earthquakes of Modified Mercalli Intensity Scale (MMI) V or greater have been centered in Rhode Island, including the 1951 South Kingstown earthquake of magnitude 4.6 on the Richter scale. The Town of Foster is about 26 miles northwest of South Kingstown.

### **Probability of Future Occurrence**

Possible. Damaging earthquakes do not normally occur in this region. Seismologists have estimated that there is about a 50% probability of a very damaging magnitude 5.0 earthquake occurring anywhere in New England, in a 50-year period<sup>20</sup>.

### **Extent**

Rhode Island is located in an area of “moderate” seismicity and “high” risk. Seismic risk applies to the seismic hazard, location demographics, and regional economics to the vulnerabilities of the structure or lifeline on the site. However, based on past occurrences, current geologic makeup and future climate changes, the Town of Foster is not anticipating any disturbances higher than a Class IV intensity.

### **Impact**

The committee recognizes that the potential for an earthquake to strike the Town of Foster is low but the hazard could afflict city wide damage, causing power outages, building collapses, water main breaks, dam failures, gas leaks, fires and injuries or deaths. Buildings that are most at risk from earthquakes are the old masonry buildings and large structures such as those in the Historic Districts.

### **Climate Change Impacts**

It is uncertain how climate change will affect earthquakes in Foster.

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20 RI Hazard Identification and Risk Assessment, 2016.



## History

No major earthquakes have happened in Foster but the resulting damage it could produce makes it a threat.

**Table 21 Historic Seismic Activity in/near Rhode Island<sup>21</sup>**

Date	Epicenter	Epicenter Magnitude	Mercalli Intensity Level
10/16/1963	Coastal MA	4.5	Caused some cracked plaster (MMI V) at Chepachet, Rhode Island.
06/14/1973	Western Maine	unknown	The intensities in Rhode Island were IV at Charlestown and I-III at Bristol, East Providence, Harmony, and Providence.
03/11/1976	Near Newport, RI	3.5	Intensity level VI shock effects felt throughout Southern New England. This earthquake has the distinction of being the largest earthquake to originate in Rhode Island.
04/20/2002	Plattsburgh, NY	5.2	Intensity level II to III shock effects felt throughout Rhode Island.
03/11/2008	Central Connecticut	2.9	No data reported for Rhode Island
06/23/2010	Ontario-Quebec	5.0	Felt throughout Rhode Island.
2011	Rhode Island	0.9	Felt locally
2012	Rhode Island	1	Felt locally
2013	Kingston, RI	Unknown	Felt locally
03/07/2014	Woonsocket	1.7	Felt locally, no tsunami statement issued
01/12/2015	Waregan, CT	3.3	Felt locally in RI, but maybe not in Foster
07/22/2015	East Providence, RI	2.3	Felt locally in RI, but maybe not in Foster

## Climate Change

Changing climate patterns globally and in Rhode Island will worsen the effects of natural hazards and affect future planning and mitigation efforts. Long-term climate change is likely to cause the following impacts in Foster:

- › Heavier, more frequent precipitation events, which may cause more riverine flooding and flash flooding events.
- › Longer periods of drought which may affect water availability and increase the threat for wildfires.
- › Increasing air and water temperatures.
- › More frequent high heat days and heat waves.

<sup>21</sup> United States Geologic Survey [http://neic.usgs.gov/neis/states/rhode\\_island/rhode\\_island\\_history.html](http://neic.usgs.gov/neis/states/rhode_island/rhode_island_history.html) and Earthquake Hazards Program "Did You Feel It" Archives.

How rapidly these changes will be felt is debatable but there is certainty within the state that municipalities need to be prepared. One approach is to become more adaptable/resilient to the changing conditions. A second approach is to mitigate the impacts by being more energy efficient and reducing air pollution- a contributor to global warming.

Through the exercise of creating this plan, the Town of Foster is exploring ways to reduce their long and short-term risks to a variety of hazards. Fortunately, being an inland community, Foster does not have to be concerned about storm surge and erosion but being in a coastal state, any storm that comes up the eastern seaboard will likely impact the town which is located about 17 miles from the shore. As climate conditions intensify, the HMPC is prepared to update this plan accordingly.



# 4

## Risk Assessment

### Facilities Inventory

The first step in the assessment process was to create the inventory of facilities of special concern to the Town. The HMPC identified the following as community assets:

- › Flood prone drainage systems
- › Roads prone to washing out
- › Bridges
- › Wastewater- ISDS
- › Drinking water wells
- › Utilities
- › Dry hydrants
- › Communication towers
- › Dams
- › Critical municipal hazard response facilities
- › Populations
- › Businesses
- › Schools
- › Recreational Facilities
- › Historic resources

During the review of these assets, the HMPC came to the conclusion that not all of these are so vulnerable they require a mitigation action within the next 5 years. As infrastructure ages, and climate conditions change, the HMPC will update this plan accordingly.

These most vulnerable assets are identified in the Community Assets Matrix, Section 4.8.

## **Hazard Mitigation Mapping**

The Town's GIS database, including parcel data, orthophotography and FEMA flood zone information, were utilized to complete the assessment. The use of this system allowed the HMPC to estimate potential fiscal and population impacts for individual parcels (see Sections 4.3 and 4.4 for results).

The final output of this exercise is the Town of Foster Resources map (Appendix C). The focus of the maps is not to duplicate all of the spatial information generated through the inventorying process but rather to present the location of the identified risks as they relate to the Town's response facilities.

## **Fiscal Impact Analysis**

The Town of Foster's parcel data and FEMA's 1% annual chance floodplain data were utilized to generate estimates of potential fiscal impacts from natural hazard events such as flooding. The information utilized from the tax assessor's database and GIS included the improvement values, land usage, and unit counts. The analysis showed that Foster is comprised of 52 square miles of land, with 3.4 square miles (6.5%) of regulatory floodplain (includes open water). These land-based floodplains are scattered throughout the Town, mainly along the brooks and streams.

HAZUS-MH was used to further understand the potential risk from a large hurricane. HAZUS-MH<sup>22</sup> is a software tool that contains models for estimating potential losses from earthquakes, floods, and hurricanes. For the purpose of this plan, a scenario was run that capture the town's risk from hurricane damage. The table below summarizes some of the potential damages. The hurricane scenario model uses the same path as the hurricane which tracked west of Foster.

In 1954, Hurricane Carol (peak gusts at 89 mph) tore through Southern New England, causing extensive damage throughout Rhode Island. If this same storm were to strike again today, it would cause nearly \$2.5 million dollars in total

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22 HAZUS modeling conducted by VHB on 4/17/2017 using HAZUS-MH 2.2.

economic losses (property damage and business interruption loss). Roughly 1 building is expected to be at least moderately damaged.<sup>23</sup>

<b>HAZUS Qualitative Damage Description</b>
<b>No Damage or Very Minor Damage</b>
Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof over, with no or very limited water penetration.
<b>Minor Damage</b>
Maximum of one broken window, door or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.
<b>Moderate Damage</b>
Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water
<b>Severe Damage</b>
Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.
<b>Destruction</b>
Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.

**Table 22 HAZUS-MH Scenarios for Foster, RI**

1954 Hurricane Carol Scenario	
<b>DAMAGE</b>	<b>AMOUNT</b>
Debris generated	18,080 tons
Buildings destroyed	0
Buildings at least moderately damaged	1
Displaced households	0
Essential Facility Damage (fire, police, schools)	<1 day loss
Residential Property (capital stock)	\$2.4 million
Business interruptions	\$82,000

23 HAZUS-MH: Hurricane Event Report, run 4/17/2017.

Table 22 displays potential damage estimates of property values of parcels that are located wholly or partially within the Town’s Special Flood Hazard Area (SFHA), or regulatory floodplain. The parcel information, using the best available data, provides the number of parcels in the SFHA, and values of the buildings on each property. Land value was not considered for this exercise. The values provided are an estimate considering some properties are located in more than one sub-watershed. This percentage was calculated in order to assist with identifying which areas are at greater risk. According to Table 22, the town-wide total potential building damages for these floodplain areas are about \$2,907,400.

**Figure 7 Hurricane Carol Path**



The most expensive residential building in the SFHA is near the Flat River and has estimated building value of just less than \$320,000.

Approximately 90% of Foster’s revenue is generated from property tax. Should any of the properties forming the tax base be destroyed by a hazardous event, a causal effect would be those property owners whose parcels remain intact would carry and increased financial burden with regards to property taxes. It is an important course of action for the Town to protect both lives and property from natural disasters. However, if Foster’s population grows, the burden of protecting lives and property grows.

Using data from the RI Geographic Information System (RIGIS) and information from the Foster Tax Assessor, the following table summarizes the value of the properties that are located within the Special Flood Hazard Areas. The buildings included are only those which can be covered by flood insurance, not accessory buildings such as sheds.

**Table 23 Property Vulnerability from Flooding**

	Commercial	Gated/Government	Residential	Total
Number	1	1	17	19
Building Value	\$299,100	Unknown	\$2,608,300	\$2,907,400

## **Built Environment**

According to HAZUS-MH, Foster has over estimated 1,890 buildings with a total replacement value (excluding contents) of \$499 million. Approximately 87% of which are associated with residential housing.<sup>24</sup>

The HMPC has identified critical infrastructure listed in the Community Asset Matrix (Table 23). The list includes: flood prone drainage systems, roads prone to washouts, bridges, ISDS, fresh water resources, utilities, dry hydrants, communication towers, dams, critical municipal hazard response facilities, populations, businesses, schools, recreational facilities, and historic resources. All of these important community resources have the potential to be affected by a natural or manmade hazard. The magnitude of the losses would be dependent upon the type, location, and extent of each unique hazard.

The Town's zoning laws help dictate future development while maintaining Foster's rural character. Continued enforcement of Rhode Island State building codes and new regulations as required will lessen potential damage caused by a natural hazard event. The codes adopted by the Town of Foster range from building codes and design standards, to zoning regulations.

While temporary street flooding is generally a nuisance, the HMPC is most concerned about the effects of strong winds on their built environment. Wind vulnerability to structures can be controlled in part by building and construction standards. Wind can also bring down trees, power, and communication lines, reducing access to the transportation network and leaving residents without power.

Foster has a few local roads that used to be connected via bridges but have since been left to become dead end roads. Some residents are concerned about first responders being able to quickly get to the homes during an emergency, especially if fallen trees are blocking the road. Emergency management officials have not expressed such concern but will be considering this issue when the plan is updated.

## **Population Impact Analysis**

Of primary concern during a hazard event is protecting the health and safety of Foster residents. In addition to knowing the total population, it's also important to estimate how many people would be impacted by loss of service or need to evacuate. According to the 2015 US Census, there are 1,809 housing units in Foster supporting a population estimate of 4,671. The population is very spread-out

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24 HAZUS-MH: Hurricane Event Report, run 4/17/2017. 2010 Census data and 2010 dollars.

throughout the town. There are a few areas along Route 94, Route 6, Boss Road, and Foster Center that are slightly more densely populated.

Using the 2014 Tax Assessor’s Database, the Rhode Island GIS e911 structure file, and the Town’s GIS, it was determined that there are total of 19 non-accessory structures within Town’s base flood zones (1 is commercial, 2 are public, and 17 are residential buildings). In addition to the transportation network that would be crippled by floodwaters, some residents’ homes may be flooded.

Drought condition can quickly have wide-spread impacts to residents who rely on available groundwater for drinking, bathing, agriculture, farming, and fire-fighting.

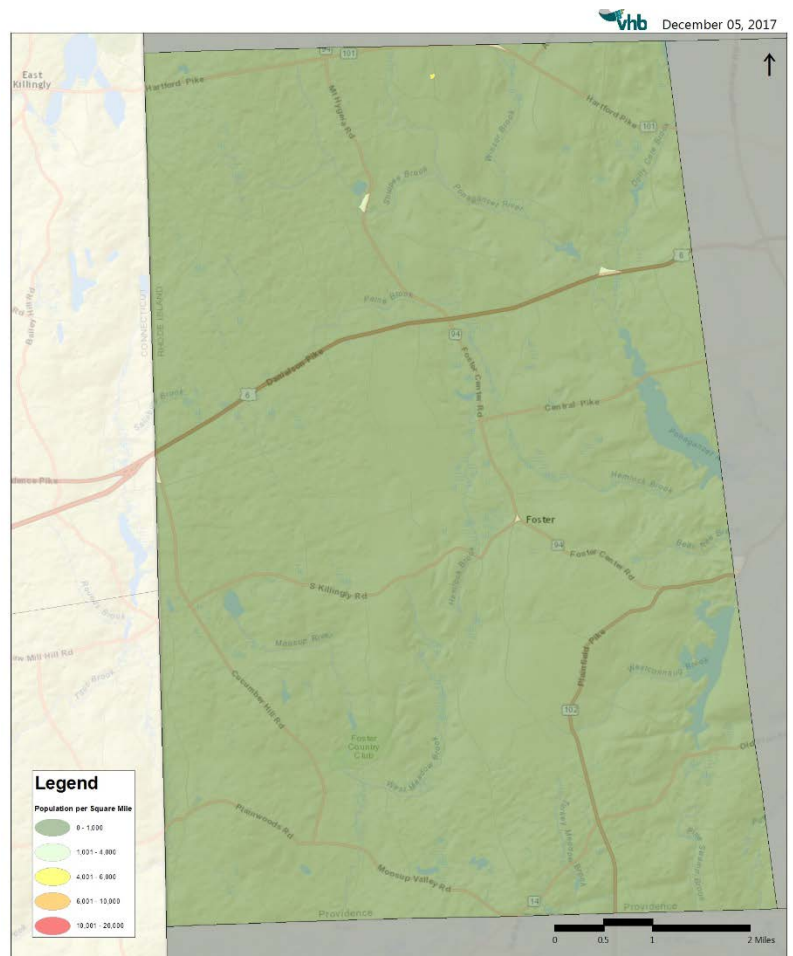
There is no current estimate on the number of visitors to any of Foster’s recreation facilities. However, during the summer months, the ballfields are particularly popular. Fortunately, there is usually some advance warning for lightning and wildfires, allowing visitors to seek shelter; provided they heed the warnings.

## Natural Environment

Foster’s natural resources and environment define the towns’ character. Residents rely on the benefits of clear brooks and rivers, diverse wildlife habitats, and scenic natural resources. Large areas of town are zoned for 4.59-acre/residential unit density to preserve the environmentally sensitive land. The following natural resources limit development:

- Steep slopes at Moosup River/West Meadow Brook, along Quanduck Brook, south of the Westconnaug Reservoir, and north of the Barden Reservoir;

**Figure 8 Population Density**





- Bedrock outcrops in the southern part of town;
- Floodplains in narrow bands along streams and rivers;
- Hydric or rocky soils;
- Agricultural Soil of Prime or Statewide Importance;
- Wetlands regulated by the State which provide habitat, groundwater recharge, and surface water storage and filtration;
- Surface Waters of the Braden and Westconnaug Reservoirs which feed into the Scituate Reservoir;
- Threatened/Endangered Species and Important Habitats at Hemlock Swamp, Jerimoth Hill, and Round Hill primarily;
- Wellhead protection zones and outwash deposits which protect drinking water wells.

## **Vulnerability of Future Structures**

Since the 2005 hazard mitigation plan, Foster has experienced slow growth. Western Foster remains the most rural third, Eastern Foster being more densely populated, and Central Foster being the transition between the two extremes.

Foster has implemented a general business Mixed Use zone on Route 6. Within that zone, the maximum building size has been changed from 10,000 sq.ft. to a lot based size criterion. The town is partnering with GrowSmart and Providence Water to consider a zoning overlay to permit some accessory business uses with single family residences.

There is enough land available to meet Foster's near-future development needs for both residential and non-residential structures. An estimated 7% of the city is zoned for residential uses. Future growth will likely be centered along Route 6 as commercial development.

Though economic recovery and growth in Foster has moved at a slower pace than the state as a whole, there are indeed economic development opportunities to be explored. These include redevelopments taking place along commercial corridors in Foster and the spirit of self-reliance among residents, many of whom are open to new economic opportunities for themselves through unconventional resources or venues.

Foster's vulnerability to natural hazards is not expected to change dramatically over the next five years due to increased development. Enforcement of current building codes will ensure that development will be stronger and more resilient than some of the older structures in Foster.

## **Community Assets Matrix**

(next page)

**Table 24 Critical Infrastructure/Community Assets Matrix**

At Risk	Location	Hazard/Problem	Mitigation Actions
<p><b>Flood Prone Drainage Systems/Streets</b></p> <p><b>Roads Washed Out</b></p>	<p>Less than 40% of roads are unpaved Dirt roads prone to washouts- continue to work on maintenance</p> <p>Danielson Pike- bottom of Dolly Cole Hill North Road (dirt) between Boswell and South Killingly- channelized water from private property. Foster Country Club -at parking lot into the road by the pond but drains quickly Salisbury/Balcolm- washout, dirt road issue 94/Foster Center at North Road- grade is higher than road</p>	<p>Flooding which leads to washouts</p>	<p><b>Action #1:</b> Pave dirt section of North Road to address RIDEM violation related to sediment entering the water system.</p>
<p><b>Bridges</b></p>	<p><u>State-owned</u> Dolly Cole Ponagansett River Braden Reservoir Hemlock Brook (Central Pike) Spears Moosup Valley</p> <p><u>Town-owned</u> Rams Tail Road Hemlock Road- closed right now (weight limit) Mill Road Central Pike North Road Plain Woods Road Windsor Road Windsor Brook King Road</p>	<p>All hazards as it relates to access the bridges provide.</p>	<p><b>Action #2:</b> Repair headwall of the bridge at Johnson’s Road, south of Harrington, by the Country Club.</p>

At Risk	Location	Hazard/Problem	Mitigation Actions
<b>Wastewater</b>	No municipal system. Private on-site waste disposal systems.	All hazards- Loss of power	
<b>Water Supply Systems</b>	No municipal water. All on private wells.	<p>All hazards- Loss of power</p> <p>Certified wells at South Foster and Moosup Valley for community dinners, but not for public consumption/distribution.</p> <p>Foster Center is on a certified well. Don't have people to man shelters and points of distribution.</p> <p>There may be a large portion of the Town (Green Acres and Kennedy Road) that does not have cell coverage to receive alerts.</p>	<b>Action #3:</b> Public Outreach and Education Plan – section on how to communicate emergency water supplies.
<b>Utility Facilities</b>	Only 2 power lines coming into the Town.	Wind, Ice	Ongoing training for emergency responders responding to incidents involving solar arrays. Ongoing National Grid tree trimming.
<b>Dry Hydrants</b>	<ul style="list-style-type: none"> <li>• 5 Briggs Road</li> <li>• 80 Moosup Valley Road/Green Acres Pond</li> <li>• 41 Johnson Pond</li> <li>• 29 Danielson Pike</li> <li>• 145 Danielson Pike</li> <li>• Central Pike/Barden Reservoir</li> <li>• Central Pike/Hemlock Brook</li> </ul>	<p>Drought Snow, ice, sedimentation and veg growth</p> <p>Limiting factors: land owner permission, financing, and available</p>	<p>Ongoing action: Fire departments annually clearing pond access from vegetation, silt, and snow.</p> <p><b>Action #4:</b> Expand the number of dry hydrants in town. Future Sites:</p>

At Risk	Location	Hazard/Problem	Mitigation Actions
	<ul style="list-style-type: none"> <li>• 8 Mt. Hygeia</li> <li>• 3-0 Burgess Road</li> <li>• 7 Shippee School House Road</li> <li>• 180 Hartford Pike</li> <li>• Hartford Pike/East Killingly CT</li> <li>• 119 South Killingly Road</li> </ul>	ponds	<ul style="list-style-type: none"> <li>• Plainwoods Road Bridge, near CT state line</li> <li>• South Killingly Road at Church Pond</li> <li>• 9 Barbs Hill Road</li> <li>• 220 Plainfield Pike</li> <li>• Ginny B Campground at Old Pond</li> <li>• Hemlock Road at the bridge</li> <li>• Mills Road at the bridge</li> <li>• South Killingly and Walker Road.</li> </ul>
<b>Communication Towers</b>	Dispatch and communication equipment at Foster Center Fire Department. Repeaters on Waterman Hill Rd. and Jerimoth Hill Rd. Cell towers- Danielson Pike, Luther Rd, Danielson Pike at State Line	Wind, Ice	<b>Action #5:</b> Cell towers needed at Luther Road and Moosup Valley.  Ongoing action: Standard condition to leave space in 3 <sup>rd</sup> party communication sheds for a Town hook-up.
<b>Dams</b>	Earthen dams, no gates. 23 Low Hazard dams Westconnaug Reservoir- <b>High</b> - flows into Scituate Spear Pond- <b>High</b> Gorham, N. Farm Pond- <b>Significant</b> Shippee Sawmill Pond -Low- seeping during storm, natural draining	Flooding	<b>Action #2:</b> Repair headwall of the bridge at Johnson’s Road, south of Harrington, by the Country Club.
<b>Critical Municipal Hazard Response Facilities</b>	South Foster Fire Station/Shelter/EMS (5 Mt. Hygeia Road) Moosup Valley Fire Station/Shelter (55 Moosup Valley Road) Foster Center Fire Station/Shelter (86 Foster Center Road) Police Station (182 Howard Hill Rd.) Foster Town Hall (181 Howard Hill Rd.)	Manning shelters difficult. Tending to emergency. Hinders decision to open.  Dispatch at Police Station but don’t have enough command staff to sit in	Ongoing: ICS and NIMS classes for Emergency Management.  Ongoing: Plans underway to make the Police Station the primary EOC until a larger facility is built.

At Risk	Location	Hazard/Problem	Mitigation Actions
	DPW Garage (86 Foster Center Road) Foster Ambulance Corps (22 Mount Hygeia) Paine School- Shelter (160 Foster Center Road)	an EOC.  EMA Director and Associate are FD and State DMAT.	
<b>Populations</b>	All residents  <u>Seasonal Campgrounds</u> - expands by 2,000 people in summer Summer- Ginny B Campground Dyer Woods  <u>Group Homes</u> East Killingly Road Hemlock Village – Senior, disabled (110 Foster Center)  <u>Public Housing</u> Hemlock Village	Severe weather	<b>Action #6:</b> Public Education and Outreach Plan – section on seasonal populations and distributing EMA notices
<b>Businesses</b>	Most are small businesses- large group events/functions at bars Foster Country Club (seasonal) 3 gas stations Solar fields- fed into the grid Little Rhody Vasa Park (seasonal)	All hazards	<b>Action #7:</b> Public Education and Outreach Plan – section on educating business owners on how to reduce risk from natural hazards
<b>Schools</b>	Paine School (only shelter, not Red Cross certified)	All hazards	Ongoing phone list to notify parents of emergencies. Ongoing emergency procedures plan.
<b>Recreation Facilities</b>	Woody Lowden (Youth and Senior Center) Dunbar Field Green Acres New Town Recreation Field/Capt. Henry Phillips Park (under construction) Foster Fairgrounds	Lightning	<b>Action #6:</b> Public Education and Outreach Plan – section on seasonal populations and distributing EMA notices

At Risk	Location	Hazard/Problem	Mitigation Actions
<p><b>Historic Resources</b></p>	<ul style="list-style-type: none"> <li>• Foster Center Historic District, Foster Center, Howard Hill and South Killingly Roads</li> <li>• Captain George Dorrance House, Jenks Road</li> <li>• Solomon Drown House, "Mount Hygeia," Mount Hygeia Road</li> <li>• Mount Vernon Tavern, Plainfield Pike</li> <li>• Hopkins Mills Historic District, Old Danielson Pike</li> <li>• Clayville Historic District, bounded by Cole Avenue and Victory Highway in Foster, and Cole Avenue, Field Hill Road, Pleasant Lane and Victory Highway in Scituate</li> <li>• Moosup Valley Historic District, Barb's Hill, Cucumber Hill, Harrington, Johnson, Moosup Valley, Plain Woods and Potter Roads</li> <li>• Breezy Hill (archeological) Site, (RI-957), Danielson Pike</li> <li>• Deacon Daniel Hopkins House, Balcom Road and Old Central Pike</li> <li>• Burgess Farm, Nelson Aldrich Birthplace, Burgess Road</li> <li>• North Foster Baptist Church, East Killingly Road</li> <li>• Phillips-Wright House, Foster Center Road</li> <li>• Paine Farm, Paine Road</li> <li>• Whidden-Fuller Farm, Plainfield Pike</li> <li>• East Killingly Road Historic District</li> <li>• Howard Hill Historic District</li> <li>• Windsor Road Historic District</li> <li>• Hartford Pike/Route 101</li> <li>• Mount Hygeia Road</li> <li>• Theodore Foster Drive</li> </ul>	<p>Wind, Ice, Snow, Fire, Post-disaster clean-up</p>	<p><b>Action #8:</b> Educate the Preservation Society on hazard mitigation.</p>



# 5

## Programmatic Capabilities

### Purpose

This capability assessment examines the existing studies, plans, programs, and policies that have incorporated hazard mitigation and other pro-active tools into the Town system. The purpose of the capability assessment is to highlight successes, identify shortcomings, and to lay the groundwork for possible improvement. Foster recognizes that the inclusion of mitigation initiatives not only benefits the community by reducing human suffering, damages and the costs of recovery, but also helps build and maintain the sustainability and economic health of the Town. Section 5.2 details the Town’s existing relevant plans, programs, and policies that were reviewed during the drafting of this plan.

### Primary Plans, Regulations, and Departments

#### PLANS AND REGULATIONS

#### Foster Comprehensive Plan

The Foster Comprehensive Plan was adopted on February 2004 and is currently being updated as of July 2018. The Comprehensive Plan discusses current community conditions, expected future trends, and new initiatives, challenges, and



opportunities. It provides a vision for future community development by identifying updated goals, policies, and implementation actions. The current plan includes a natural and cultural resources element that focuses on the natural environment. However, it is expected that the new revision will include elements of hazard mitigation and climate change, using this document as a reference.

## **Zoning Ordinance**

September 9, 2010. Foster's Zoning Ordinance does not directly regulate development in a floodplain. However, the Foster Land Development and Subdivision Regulations (Adopted November 1976, Amended December 20, 1995) Section VII Physical Design Requirements, B. Construction Improvements, 5. Surface and Subsurface Drainage requires "Appropriate best management practices (BMPs) as described in the RIDEM Rhode Island Stormwater Design Manual shall be utilized in the design for all projects." In addition, the town's major, minor and administration subdivisions applications require submission of property's relation to the floodplain.

## **Subdivision Regulations**

Amended December 20, 1995. A minor subdivision is strictly residential and consists of five or fewer units or lots. All nonresidential subdivisions are major subdivisions. Zoning ordinance does not require burying utility lines or management of stormwater.

## **Stormwater Management Plan**

All development and redevelopment in the Town of Foster requires the development and submittal of a Stormwater Management Plan with any kind of preliminary plan.

This requirement supports hazard mitigation by encouraging reducing and disconnecting impervious surface area, and identify activities that may adversely impact ground or surface waters.

## **National Flood Insurance Program (NFIP)**

The Town of Foster is an active and compliant member of the National Flood Insurance Program since 1980. As such, Foster residents are able to purchase flood insurance to protect their property against flood losses. The Town of Foster has adopted the most recent (October 2015) Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS). The Town has designated the Building Official and Planner as the NFIP Coordinator to manage the program. The Town maintains their standing in the program by offering advice to residents on protecting their property from flooding, interpreting flood insurance rate maps.

## **DEPARTMENTS**

### **Planning Department**

The Department serves many functions related to the physical development of the community. The department is responsible for Town zoning, building inspection, construction development, as well as GIS mapping needs. The Department actively works to improve Foster's economy by encouraging appropriate economic development while maintaining the town's rural character. Additionally, the department oversees the administration of various State and Federal Grants including the Community Development Block Grant (CDBG). The Town Planner enforces the land development regulations through the Planning Board and is also the lead for updating the hazard mitigation plan. It is anticipated that they will hold this roll in the future.

### **Emergency Management**

The primary mission of the Foster Emergency Management Agency is to mitigate against, prepare for, respond to, and recover from natural or man-made disasters.

The Foster Emergency Management department is currently staffed by a Director, Deputy Director, Special Needs Registry Coordinator, and CERT Director. As is common with many of the Town employees, members of this department also volunteer their time to other response agencies. The Emergency Management Director is responsible for all emergency planning. They are also one of two certified amateur radio operators in Providence County. This department, manages the Emergency Operations Center (EOC), works with the RI Department of Health, and promotes the RI Special Needs Emergency Registry. The Department promotes the CodeRED Emergency Notification System to send emergency notifications to registered subscribers by phone, email, text, and social media.

The Foster Emergency Operation Plan is outdated and probably needs more than just an update. It should be thoroughly reviewed to identify how the Town will respond to and recover from all hazards.

As of September 2017 the Town does not have a true Emergency Operations Center (EOC). During an emergency, coordinators congregate in the one-room Benjamin Eddy Building, but the TV, internet, radio and communication equipment is located in the Police Station across the street. Also, the Town does not have the staffing levels to be able to have dedicated people sitting in an EOC. Much of the Emergency Management Staff also volunteer with fire departments and the ambulance crews.

The Paine School serves as the local shelter but is not Red Cross certified and is rarely opened as a shelter. The Hazard Mitigation Committee has noted that most residents are resilient and self-reliant. They have their own emergency generators or

go to neighbors if they need assistance/shelter. The Town does not have the staff to man the shelter, especially since it is rarely used. The few instances where the Town could see a reason to open the shelter would be if there was a wide-spread event or if a blizzard strands motorists on Route 6.

Pets are not allowed at public shelters

[https://www.ri.gov/hurricane/animal\\_plan.php](https://www.ri.gov/hurricane/animal_plan.php). Pet owners are encouraged to make prior arrangements or take their pets to shelters being manned by the Rhode Island Disaster Animal Response Team <http://www.orgsites.com/ri/ridart>. During Hurricane Sandy, that location was at Thayer Ice Arena in Warwick.

## **Public Works**

The Public Works facility is located 86 Foster Center Road. This property houses all of the Town's maintenance equipment, vehicle repair facilities, sand and salt storage, and fueling facilities.

Public Works maintains the following ongoing mitigation strategies: snow plowing and sanding, ice prevention, storm drain and culvert maintenance, town and police vehicle repair, road repairs, and tree trimming (in partnership with the utility companies).

## **Building & Zoning Department**

The Building Zoning official is responsible for issuing all building permits, permit inspections and code enforcement.

## **Police Department**

The Foster Police Department consists of 8 sworn police personnel including a Chief, a Captain, a Sergeant, and five Patrol Officers. The Department is also supported by four civilian employees. The Department operates twenty-four hours a day and responds to all criminal complaints and Town-wide emergencies. The Department is located on 182 Howard Hill Road.

Police Department currently deploys the use two electronic signs to notify drivers of hazards. Emergency information and bulletins are posted on the Town's Facebook Page. The Police department also uses a CodeRED emergency notification system.

## **Fire Departments**

Foster has 3 Volunteer Fire Departments: South Foster (Station 1), Moosup Valley (Station 2), and Foster Center (Station 3). Station 1 has 21 members, 1 tanker, one engine, one rescue, and one brush truck. Station 2 has one ambulance, two tankers, one engine, one brush truck, and one inflatable boat. Station 3 has 20 members, one engine, one rescue engine, one brush truck, an aluminum boat, and one search and rescue vehicle. All Fire Departments have Emergency Medical Technicians (EMTs) and paramedics to respond to emergency calls.

### **Foster Ambulance Corps**

Private company with a staff of approximately 50 people and two ambulance transport vehicles. It is located at Station 1 HQ, 24 Mount Hygeia Road. The Ambulance Corps has transport abilities unlike the rescue responders with the fire stations.

### **Town Council**

The Town Council is made up of five elected members committed to providing an effective and efficient government for residents and businesses. The Town Council approves local hazard mitigation plans and zoning ordinances.

The Town Council President is the chief executive and administrative officer of the Town.

### **Planning Board**

The Planning Board consists of the Town Planner and seven members appointed by the Town Council to serve for two to four years. This Board is responsible for preparing and adopting the Comprehensive Plan and to regulate land development to encourage economic growth while maintaining community character.

### **Land Trust**

The Foster Land Trust is administered by seven trustees to preserve the natural resources of Foster for present and future generations. Working within the guidelines of the Foster Comprehensive Plan, their goal is to add economic and lifestyle value to the entire community while helping retain the rural character of the town.

### **Conservation Commission**

The Foster Conservation Commission, made up of seven members, and acts in an advisory capacity in all matters concerning the following: wetlands planning and mapping; environmental planning; open space planning; preservation of farmlands; erosion control; and gravel and loam stripping control.

### **Engineering Board**

The Town of Foster has organized an Engineering Board which consists of the heads of the fire departments, police departments, and emergency management. The group meets monthly to discuss emergency response and rescue equipment needs, personnel infrastructure, and capacities.

## **State Programs**

### **Rhode Island State Building Code**

All municipalities within the State of Rhode Island share a single building code (RIGL 23-27.3-100 et. al.). The Code itself (which incorporates the International Building Code) was last amended in 2012 and provides comprehensive construction requirements designed to mitigate the impacts from natural hazards, such as high wind events. The Code is enforced by the Foster Building Department and provides an additional layer of regulatory control to those discussed above.

### **Rhode Island State Fire Code Regulations**

Foster has adopted the RI Fire Safety Codes to safeguard life and property from the hazards of fire and explosives in accordance with safe practice. The Code is enforced by the Foster Fire Departments and provides reasonable minimum requirements for fire prevention and protection.

### **Rhode Island State Dam Safety Program**

The Town of Foster participates in the State Dam Safety Program because of the two-high hazard and one significant hazard dams in the town. The State Dam Safety Program was created to facilitate the enforcement of the primary dam inspection law (RIGL 46-19, Inspection of Dams and Reservoirs). RIGL 46-19 states that dam owners are responsible for the safe operation, maintenance, repair, and rehabilitation of a dam, which are the essential elements in preventing dam failure; furthermore, dam owners are liable for the consequences of accidents or failures of their dams. According to the State of Rhode Island 2015 Dam Safety Program Report, the following have been identified as program limitations: unclear ownership of numerous high hazard dams, construction of buildings within inundation areas below dams, lack of funding to repair or remove privately owned dams, inadequate spillway capacities and engineering analyses, lack of Emergency Action Plans across the state, inadequate staffing, increase in rainstorm intensities. Of the three high and significant hazard dams in Foster, all have Emergency Action Plans on file.

### **Rhode Island DEM Wetland Regulations**

The Rhode Island Department of Environmental Management is responsible for regulating alterations of the freshwater wetlands throughout the State. Since many floodplains are also wetlands, appropriately managing these resources help maintain proper floodplain function. These regulations ensure that actions in this plan which will alter the physical landscape will not do so at the expense of wetlands.



# 6

## Mitigation Actions

### **Mission Statement**

*To preserve and enhance the quality of life, property and resources by identifying areas of the community that are at risk from natural hazards and by implementing specific mitigation actions in order to protect the infrastructure, population and historical, cultural and natural resources in Foster.*

### **Mitigation Goals**

Through these mitigation goals, the Foster Hazard Mitigation Plan Committee aims to:

1. Implement actions which protect the lives and property of the Town of Foster's residents
2. Implement actions which protect the Town of Foster's critical facilities and infrastructure
3. Implement actions which protect the Town of Foster's cultural, historical, natural, economic, and agricultural resources

### **Status of Actions Proposed in 2005**

Foster's Hazard Mitigation Plan 2005 proposed a mitigation strategy with actions that covered all the hazards of concern. Details for each action were

not provided to the level that would be helpful today. The table below summarizes the status of previous actions.

**Table 25 Status of 2005 Actions**

<b>Action</b>	<b>Status</b>	<b>Reason why it is not complete- if applicable (shift in focus, funding, etc.)</b>	<b>Other comments</b>
Establish a priority list of streets to be repaired	Ongoing		The Town has a 5-year Road Plan
Make necessary repairs to roads, in priority order	Ongoing		
Culvert replacement and paving on Shippee Schoolhouse Road	Completed		Completed in 2010
Identify funding sources and purchase a generator for shelter facility	Completed		Done and generator installed
Provide seasonal residents at camping areas with shelter and evacuation route information	Partially complete	No push to complete	Campgrounds are instructed to call Fire Departments. Roll into 2018 Plan as a larger effort
New developments/projects will be reviewed with respect to drainage and run-off issues that can potentially affect surrounding areas.	Ongoing		This is met through the land development and drainage projects in wetlands
Public Education and Outreach (property owners and businesses)	Partially complete	No push to complete	Town is currently available for post-disaster help but will roll this into a larger effort in the 2018 Plan.
Public Education and Outreach (campers)	Not done	No push to complete	Roll into 2018 Plan as a larger effort
Continue working with Water Supply Board to improve access to Reservoir property	Ongoing		Ongoing effort but little faith by the Town that it will ever be a sympathetic relationship

## Mitigation Actions

The Foster HMPC decided to propose actions that addressed certain vulnerabilities that were identified earlier in the planning process. See Chapter 4.

The following tables summarize the specific problem and proposed possible solution, details the primary tasks to be undertaken, identifies an appropriate lead and anticipates financing options. Each action was given a priority ranking of low, medium, or high as determined by the Committee. The Committee understands that implementation of many of these proposed actions require the Town to secure external funding.

There are necessary planning elements that need to be completed before additional mitigation actions can be considered. The Committee has identified a range of actions below, some of which are planning activities. However, there is a mitigation action identified for each vulnerable area where applicable.

### Priority Level

- › High: Reduces the greatest risks, is important to accomplish first
- › Medium: May need other actions to be completed first
- › Low: Less of an impact on safety and property

### Time Frame (from date of plan adoption)

- › Short Term: within 1-3 years
- › Medium Term: within 3-5 years
- › Long Term: greater than 5 years



**VULNERABLE AREA: Flood Prone Drainage Systems**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
<b>1-</b> Pave dirt section of North Road <ul style="list-style-type: none"> <li>• ¾ mile stretch from Boswell Trail to South Killingly Road</li> </ul>	<input type="checkbox"/> Local Plans and Regulations <input checked="" type="checkbox"/> Structure and Infrastructure <input type="checkbox"/> Natural Systems Protection <input type="checkbox"/> Education and Awareness	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low <div style="text-align: right;"><b>ACTION STATUS</b></div> New

**RATIONALE- WHY IS THIS IMPORTANT?**

Paving will reduce sediment entering the water system, thereby maintaining the natural function of the streams and address a RIDEM violation related to sediment loading.

BENEFITS	OBSTACLES	
Improve natural function of streams	Cost	
LEAD/CHAMPION	SUPPORT	
Foster DPW	Foster Planning Department	
POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town of Foster Capital Budget	\$250,000. Not just re-paving but actually rebuilding road.	<input type="checkbox"/> Short Term (0-3 years) <input checked="" type="checkbox"/> Medium Term (3-5 years) <input type="checkbox"/> Long Term (more than 5 years)

**OTHER NOTES**

Not many permanent flooding issues, Foster sits at the top of a hill. Swales are kept clear to divert water on the sides of the road into the woods.

**VULNERABLE AREA: Bridges**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
2- Repair headwall of the bridge at Johnson’s Road, south of Harrington, by the Country Club.	<input type="checkbox"/> Local Plans and Regulations <input checked="" type="checkbox"/> Structure and Infrastructure <input type="checkbox"/> Natural Systems Protection <input type="checkbox"/> Education and Awareness	<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	<input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low <div style="text-align: right;"><b>ACTION STATUS</b></div> New

**RATIONALE- WHY IS THIS IMPORTANT?**

Displacement of the headwall can lead to separation of the spillway which could compromise the integrity of the spillway. The river will washout the road.

<b>BENEFITS</b>	<b>OBSTACLES</b>
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Protects the integrity of the dam and the downstream properties and roads

<b>LEAD/CHAMPION</b>	<b>SUPPORT</b>
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Foster DPW

None.

<b>POTENTIAL FUNDING SOURCES</b>	<b>ESTIMATED COST</b>	<b>TIMELINE</b>
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Town of Foster Capital Budget

\$85,000

Short Term (0-3 years)  
 Medium Term (3-5 years)  
 Long Term (more than 5 years)

**OTHER NOTES**

Made of cinderblocks in the 1930s. Located in the lowest basin of the valley.

**VULNERABLE AREA: Water Supply Systems**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
<p><b>3-</b> Public Outreach and Education Plan (section on how to communicate emergency water supplies).</p> <ul style="list-style-type: none"> <li>Let people know in advance where to look for updates or where supplies will be.</li> <li>Distribute notices and storm check lists through social media, Town Clerk, and School Messenger (schools).</li> <li>Regular or quarterly messaging from Emergency Management using FEMA materials.</li> </ul>	<p><input type="checkbox"/>Local Plans and Regulations  <input type="checkbox"/>Structure and Infrastructure  <input type="checkbox"/>Natural Systems Protection  <input checked="" type="checkbox"/>Education and Awareness</p>	<p><input checked="" type="checkbox"/>1  <input type="checkbox"/>2  <input type="checkbox"/>3</p>	<p><input checked="" type="checkbox"/>High  <input type="checkbox"/>Medium  <input type="checkbox"/>Low</p> <p><b>ACTION STATUS</b>                      New</p>

**RATIONALE- WHY IS THIS IMPORTANT?**

The entire town is on well water. During a power outage, people without generators will need access to fresh water. The Town has a system for obtaining and distributing water, but needs to communicate how/when these resources will be available.

BENEFITS	OBSTACLES
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Educate residents to better prepare themselves.

LEAD/CHAMPION	SUPPORT
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Foster Emergency Management	Foster Fire Districts
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POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
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Staff time	\$1,000	<input checked="" type="checkbox"/> Short Term (0-3 years) <input type="checkbox"/> Medium Term (3-5 years) <input type="checkbox"/> Long Term (more than 5 years)
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**OTHER NOTES**

Many Foster households are self-reliant and have either backup generators or other means to take care of their needs during an emergency. Currently deploy electronic signs on Routes 6 and 94 and put messages up on Facebook. Welcome packet given to new residents when they come into Town Hall. The Town will consider including generator information in this welcome packet.

### VULNERABLE AREA: Dry Hydrants

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
4- Expand the number of dry hydrants in town.	<input type="checkbox"/> Local Plans and Regulations <input checked="" type="checkbox"/> Structure and Infrastructure <input checked="" type="checkbox"/> Natural Systems Protection <input type="checkbox"/> Education and Awareness	<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low
			<b>ACTION STATUS</b>
			New

#### RATIONALE- WHY IS THIS IMPORTANT?

There are only a few dry hydrants in town which limits residents access to fire-fighting resources.

BENEFITS	OBSTACLES
Improves firefighting response further protecting property and forested areas. Better insurance for residents closer to hydrants.	Land owner permission, drought, grass, financing, and available ponds.
LEAD/CHAMPION	SUPPORT
Foster Fire Districts	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
RIDEM Forestry Management Grants	\$5,000/per	<input checked="" type="checkbox"/> Short Term (0-3 years) <input type="checkbox"/> Medium Term (3-5 years) <input type="checkbox"/> Long Term (more than 5 years)

#### OTHER NOTES

This will likely be an ongoing action.

Future sites for dry hydrants:

- Plainwoods Road bridge, near CT state line
- South Killingly Road at Church Pond
- 9 Barns Hill Road
- 220 Plainville Pike at bridge
- Ginny B campground at the old pond
- Hemlock Road at the bridge
- Mill Road at the bridge
- South Killingly and Walker Road

**VULNERABLE AREA: Communication Towers**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
5- Cell towers needed at Moosup Valley.	<input type="checkbox"/> Local Plans and Regulations <input checked="" type="checkbox"/> Structure and Infrastructure <input type="checkbox"/> Natural Systems Protection <input type="checkbox"/> Education and Awareness	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	<input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low <hr/> <b>ACTION STATUS</b> New

**RATIONALE- WHY IS THIS IMPORTANT?**

Communication for emergency responders, travelers, and residents is unreliable in parts of town.

BENEFITS	OBSTACLES
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Improved communication	At the discretion of cellular providers. Property owner opposition.
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LEAD/CHAMPION	SUPPORT
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Foster Emergency Management	None.
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POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
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Cellular provider.	Unknown	<input checked="" type="checkbox"/> Short Term (0-3 years) <input type="checkbox"/> Medium Term (3-5 years) <input type="checkbox"/> Long Term (more than 5 years)
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**OTHER NOTES**

New town regulations will require cellular providers to provide space in the component shed for Town connections. A cell tower has been approved at Luther Road. Construction is anticipated to begin later in 2018.

**VULNERABLE AREA: Populations and Recreation**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
<p><b>6-</b> Public Education and Outreach Plan (section for seasonal residents)</p> <ul style="list-style-type: none"> <li>Notify seasonal populations of pending weather and emergencies</li> <li>Distribute EMA notices through School Messenger (schools)</li> </ul>	<p><input type="checkbox"/> Local Plans and Regulations</p> <p><input type="checkbox"/> Structure and Infrastructure</p> <p><input type="checkbox"/> Natural Systems Protection</p> <p><input checked="" type="checkbox"/> Education and Awareness</p>	<p><input checked="" type="checkbox"/> 1</p> <p><input type="checkbox"/> 2</p> <p><input type="checkbox"/> 3</p>	<p><input checked="" type="checkbox"/> High</p> <p><input type="checkbox"/> Medium</p> <p><input type="checkbox"/> Low</p> <p><b>ACTION STATUS</b></p> <p>New</p>

**RATIONALE- WHY IS THIS IMPORTANT?**

Foster residents are generally spread out through town. Giving them a message before they have to seek it out would be helpful.

**BENEFITS**

Improve resident safety

**OBSTACLES**

**LEAD/CHAMPION**

Foster Emergency Management

**SUPPORT**

None.

**POTENTIAL FUNDING SOURCES**

Staff time

**ESTIMATED COST**

\$1,000

**TIMELINE**

- Short Term (0-3 years)
- Medium Term (3-5 years)
- Long Term (more than 5 years)

**OTHER NOTES**

**VULNERABLE AREA: Businesses**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
<p><b>7- Public Education and Outreach Plan</b> (section for business owners)</p> <ul style="list-style-type: none"> <li>• Direct mail to businesses</li> <li>• Make FEMA business resiliency info available to business owners.</li> <li>• Emergency Preparedness Resources for Businesses. <a href="https://www.fema.gov/media-library/collections/357">https://www.fema.gov/media-library/collections/357</a></li> <li>• FEMA “Protecting Your Businesses”. <a href="https://www.fema.gov/protecting-your-businesses">https://www.fema.gov/protecting-your-businesses</a></li> </ul>	<input type="checkbox"/> Local Plans and Regulations <input type="checkbox"/> Structure and Infrastructure <input type="checkbox"/> Natural Systems Protection <input checked="" type="checkbox"/> Education and Awareness	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low <div style="border: 1px solid black; padding: 2px;"><b>ACTION STATUS</b></div> New

**RATIONALE- WHY IS THIS IMPORTANT?**

Local business owners may not know about how to make their businesses more able to withstand periods without power. Property owners may think the federal government will bail them out if there are flood damages. By using appropriate mitigation measures, they may lessen their damages in the first place.

<b>BENEFITS</b>	<b>OBSTACLES</b>
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Improve business continuity

<b>LEAD/CHAMPION</b>	<b>SUPPORT</b>
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Foster Emergency Management

None.

<b>POTENTIAL FUNDING SOURCES</b>	<b>ESTIMATED COST</b>	<b>TIMELINE</b>
----------------------------------	-----------------------	-----------------

Staff time

\$1,000

Short Term (0-3 years)  
Medium Term (3-5 years)  
Long Term (more than 5 years)

**OTHER NOTES**

**VULNERABLE AREA: Historic Resources**

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS	ACTION PRIORITY
<p><b>8-</b> Mail FEMA historic preservation material to Foster Preservation Society</p> <ul style="list-style-type: none"> <li>• Before and After Disasters: Federal Funding for Cultural Institutions. <a href="https://www.fema.gov/media-library/assets/documents/4237">https://www.fema.gov/media-library/assets/documents/4237</a></li> <li>• Case Studies in Protecting Archeological Sites <a href="http://dos.myflorida.com/media/30913/stab_guide.pdf">http://dos.myflorida.com/media/30913/stab_guide.pdf</a></li> <li>• Preparing Your Historic Resources for Natural Disasters <a href="https://www.nps.gov/preservation-grants/downloads/DisasterChecklist2015.pdf">https://www.nps.gov/preservation-grants/downloads/DisasterChecklist2015.pdf</a></li> </ul>	<input type="checkbox"/> Local Plans and Regulations <input type="checkbox"/> Structure and Infrastructure <input type="checkbox"/> Natural Systems Protection <input checked="" type="checkbox"/> Education and Awareness	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low  <div style="border: 1px solid black; padding: 2px;"><b>ACTION STATUS</b></div> New

**RATIONALE- WHY IS THIS IMPORTANT?**

The sudden loss of historic properties can negatively impact the community's character, economy, and can affect the overall ability of the community to recover from a disaster.

<b>BENEFITS</b>	<b>OBSTACLES</b>
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Protect cultural and historic properties

<b>LEAD/CHAMPION</b>	<b>SUPPORT</b>
----------------------	----------------

Foster EMA

<b>POTENTIAL FUNDING SOURCES</b>	<b>ESTIMATED COST</b>	<b>TIMELINE</b>
----------------------------------	-----------------------	-----------------

Town budget	\$200	<input checked="" type="checkbox"/> Short Term (0-3 years) <input type="checkbox"/> Medium Term (3-5 years) <input type="checkbox"/> Long Term (more than 5 years)
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**OTHER NOTES**





# 7

## Implementation and Adoption

### Prioritization of Mitigation Actions

Having identified a range of appropriate mitigation actions the Foster Hazard Mitigation Committee set about prioritizing them for implementation. THMC had an informed roundtable discussion on March 23, 2017 about the prioritization of each action. They ranked each as “high”, “medium”, and “low”. See Table 25 below. It is understood that these ranks may change and will be re-considered when the Plan is updated.

The following were considered when ranking the actions:

- › Protecting human health and safety
- › Reducing damages
- › Economic feasibility
- › Political climate
- › Environmental impact

**High Priority:** Greatest beneficial impact

**Medium Priority:** May need other actions to be completed first

**Low Priority:** Less of an impact on safety and property

**Table 26 Priority of Mitigation Actions**

<b>High</b>	Repair headwall of the bridge at Johnson’s Road, south of Harrington, by the Country Club.
	Public Outreach and Education Plan (section on how to communicate emergency water supplies).
	Cell towers needed at Moosup Valley.
	Public Education and Outreach Plan (section for seasonal residents)
	Public Education and Outreach Plan (section for business owners)
	Mail FEMA historic preservation material to Foster Preservation Society
<b>Medium</b>	-
<b>Low</b>	Pave dirt section of North Road

## Implementing the Plan

The Town of Foster and the Foster HMPC realize that successful hazard mitigation is an ongoing process that requires implementation, evaluation, and updates to this Plan. The Town also understands the importance of integrating appropriate sections of the Plan into the Town’s Comprehensive Plan, Emergency Operations Plan, and site plan review process. It is intended that this Plan and the ongoing efforts of the HMPC will preserve and enhance the quality of life, property, and resources for the Town of Foster.

Adoption of this mitigation strategy increases Foster’s eligibility for federal hazard mitigation grants. These grants originate from FEMA’s Pre-Disaster Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM) and post-disaster Hazard Mitigation Grant (HMGP) Programs. Refer to Appendix D for further information.

## Monitoring

The HMPC, under the leadership of the Town Planner, will meet annually (or more frequently if necessary), to monitor and evaluate the actions contained in the Plan. At each meeting, the committee members will discuss the actions assigned to them to ensure continual progress with mitigation efforts. The status of each mitigation action will be documented and minutes recorded for the record. The HMPC will also continue to re-evaluate membership on the committee to ensure effective engagement of the appropriate parties. New members may be invited to serve on the HMPC as priorities shift.

## Evaluation

At the annual meetings, the HMPC will evaluate both the actions and the planning process. The HMPC will base its evaluation on whether or not the actions have met the following criteria: increased public awareness/education, reduction in hazard damage, actions being implemented in the designated time frames, and actions

staying within the cost estimate. The committee will document and report its findings to the Town Council. The HMPC will involve the public in the action evaluation process by holding an annual advertised public meeting in order to review the evaluation and solicit input.

During the annual evaluation process, the Plan will be promoted online, in the local library, and at Town Hall for public review. Comments and suggests can be sent directly to the Town Planner or brought up at the advertised public meeting.

## **Revisions**

Recognizing that this is a living document, the HMPC, under the direction of the Town Planner, will make changes to it after each annual revision or a disaster, as conditions warrant. These revisions will also reflect changes to priorities and funding strategies that may have been implemented.

A full revision of the Plan will commence a year in advance of the current Plan expiration date in order to ensure the Town always has an approved Plan. The update will be completed every five years and will incorporate a formalized process for prioritizing actions and weighing the cost/benefit of such actions. All updates or revisions to the Plan will be submitted to the RIEMA. The Town Council will involve the public in the plan revision process by holding an annual advertised public meeting to present recommended revisions and solicit input. Revised Plans will also be sent to the neighboring communities for comment.

All future meetings will again be open to the public and it is the hope of the HMPC that once the public education and outreach actions begin, public involvement in the Plan will increase and will be reflected in future revisions. The HMPC will involve the public in the annual meeting by posting it on the website, in the local library, and in the local newspaper to encourage involvement.

## **Adoption**

After each evaluation cycle (every 5 years), the Foster Hazard Mitigation Plan will be presented to and adopted by the Town Council. The associated ordinance documentation will be kept as part of this plan.

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## Appendices

- A** Survey Results
- B** Public Notices
- C** Resources Map
- D** Additional Resources

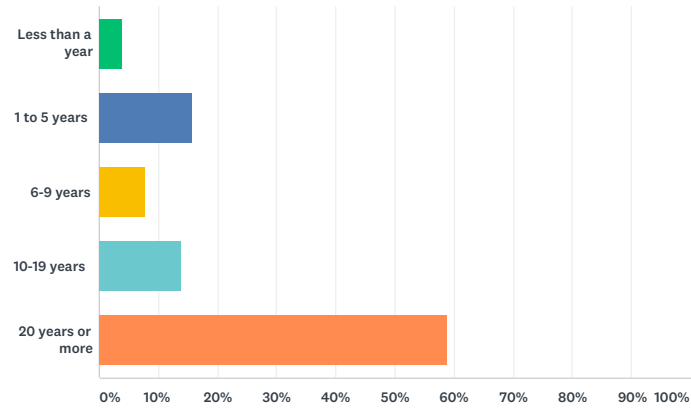
# Appendix A

## Survey Results

# Foster, RI Public Survey for Hazard Mitigation Plan Update

## Q1 How long have you lived in Foster, Rhode Island?

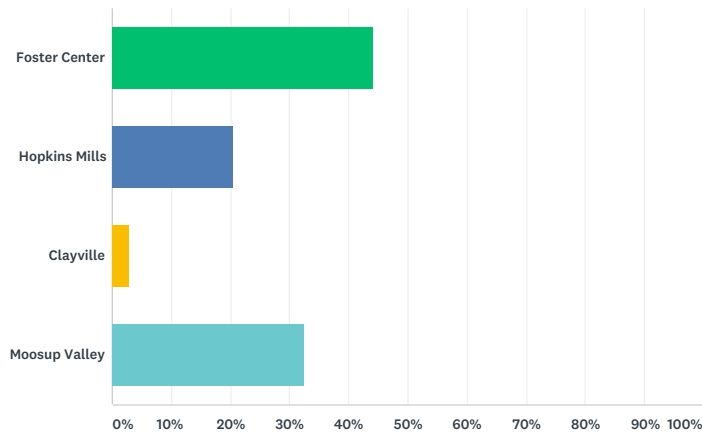
Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES
Less than a year	3.92% 2
1 to 5 years	15.69% 8
6-9 years	7.84% 4
10-19 years	13.73% 7
20 years or more	58.82% 30
TOTAL	51

Q2 What neighborhood do you live in?

Answered: 34 Skipped: 17

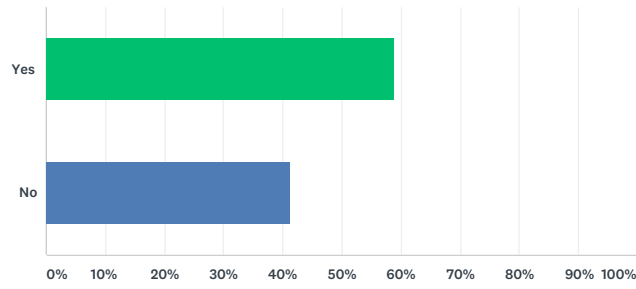


ANSWER CHOICES	RESPONSES
Foster Center	44.12% 15
Hopkins Mills	20.59% 7
Clayville	2.94% 1
Moosup Valley	32.35% 11
TOTAL	34

# Foster, RI Public Survey for Hazard Mitigation Plan Update

## Q3 Have you ever experienced or been impacted by a natural disaster/event in Foster?

Answered: 51 Skipped: 0



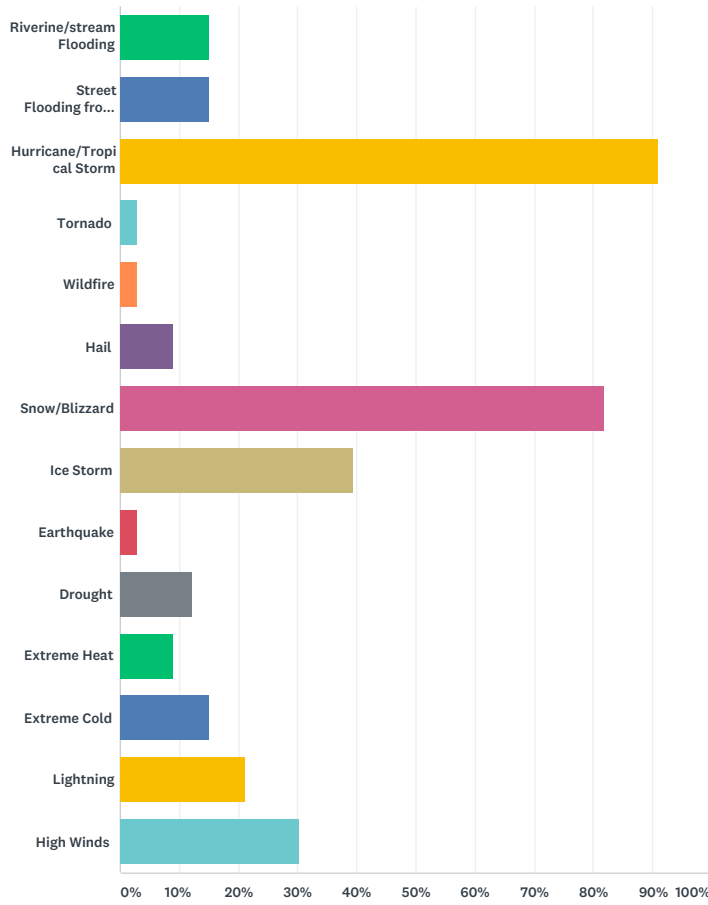
ANSWER CHOICES	RESPONSES	
Yes	58.82%	30
No	41.18%	21
TOTAL		51



# Foster, RI Public Survey for Hazard Mitigation Plan Update

## Q4 If yes, what types of disasters? Check all that apply.

Answered: 33 Skipped: 18



ANSWER CHOICES	RESPONSES
Riverine/stream Flooding	15.15% 5
Street Flooding from Heavy Rain	15.15% 5
Hurricane/Tropical Storm	90.91% 30
Tornado	3.03% 1
Wildfire	3.03% 1
Hail	9.09% 3
Snow/Blizzard	81.82% 27
Ice Storm	39.39% 13
Earthquake	3.03% 1
Drought	12.12% 4
Extreme Heat	9.09% 3
Extreme Cold	15.15% 5
Lightning	21.21% 7
High Winds	30.30% 10
Total Respondents: 33	

Foster, RI Public Survey for Hazard Mitigation Plan Update

Q5 When was the last time you experienced a natural disaster in Foster?

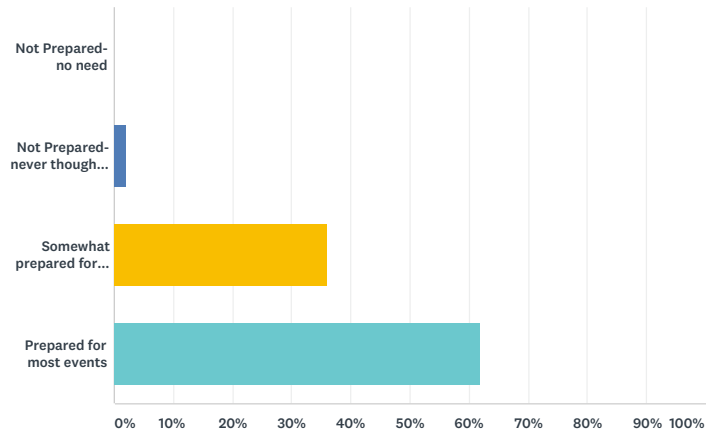
Answered: 28 Skipped: 23

4 years ago when the last hurricane hit  
TS Irene  
2011  
Last hurricane

## Foster, RI Public Survey for Hazard Mitigation Plan Update

### Q6 How prepared do you feel that you and your household/business are for the probably impacts of natural hazards?

Answered: 50 Skipped: 1

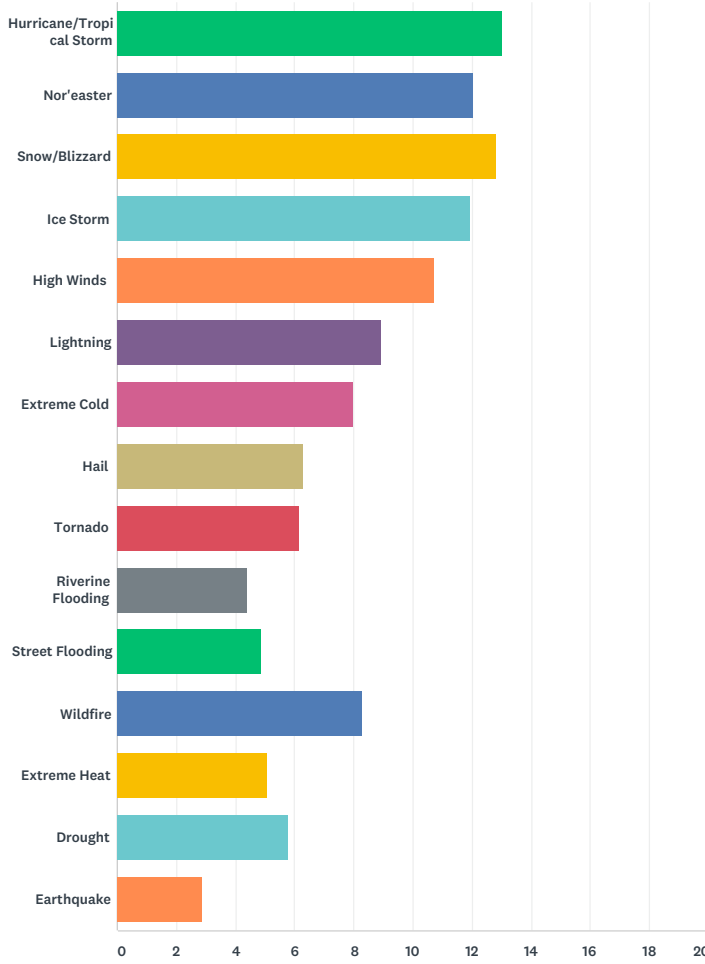


ANSWER CHOICES	RESPONSES	
Not Prepared- no need	0.00%	0
Not Prepared- never thought about it	2.00%	1
Somewhat prepared for some events	36.00%	18
Prepared for most events	62.00%	31
<b>TOTAL</b>		<b>50</b>

# Foster, RI Public Survey for Hazard Mitigation Plan Update

Q7 Click and drag the each hazard so that the one that you are most concerned about is in the #1 spot at the top.

Answered: 37 Skipped: 14



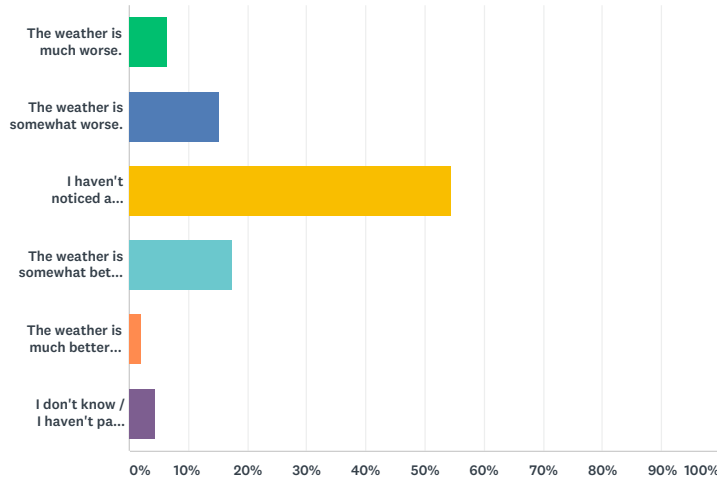
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Hurricane/Tropical Storm	44.12% 15	8.82% 3	11.76% 4	11.76% 4	5.88% 2	11.76% 4	2.94% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2.94% 1	0.00% 0	0.00% 0
Nor'easter	9.09% 3	27.27% 9	27.27% 9	9.09% 3	6.06% 2	6.06% 2	6.06% 2	0.00% 0	3.03% 1	0.00% 0	0.00% 0	3.03% 1	3.03% 1	0.00% 0
Snow/Blizzard	14.71% 5	35.29% 12	23.53% 8	5.88% 2	11.76% 4	0.00% 0	0.00% 0	5.88% 2	0.00% 0	0.00% 0	2.94% 1	0.00% 0	0.00% 0	0.00% 0
Ice Storm	11.76% 4	14.71% 5	17.65% 6	29.41% 10	8.82% 3	5.88% 2	0.00% 0	2.94% 1	2.94% 1	2.94% 1	0.00% 0	0.00% 0	2.94% 1	0.00% 0
High Winds	3.23% 1	3.23% 1	9.68% 3	22.58% 7	19.35% 6	22.58% 7	9.68% 3	0.00% 0	3.23% 1	3.23% 1	0.00% 0	3.23% 1	0.00% 0	0.00% 0
Lightning	3.45% 1	3.45% 1	0.00% 0	3.45% 1	6.90% 2	20.69% 6	24.14% 7	17.24% 5	6.90% 2	6.90% 2	0.00% 0	3.45% 1	0.00% 0	3.45% 1
Extreme Cold	0.00% 0	3.23% 1	0.00% 0	6.45% 2	12.90% 4	6.45% 2	25.81% 8	6.45% 2	12.90% 4	0.00% 0	12.90% 4	3.23% 1	3.23% 1	3.23% 1
Hail	3.57% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	7.14% 2	21.43% 6	17.86% 5	14.29% 4	10.71% 3	14.29% 4	0.00% 0	7.14% 2
Tornado	0.00% 0	3.45% 1	6.90% 2	0.00% 0	0.00% 0	3.45% 1	0.00% 0	13.79% 4	20.69% 6	17.24% 5	3.45% 1	3.45% 1	6.90% 2	10.34% 3
Riverine Flooding	3.57% 1	0.00% 0	0.00% 0	3.57% 1	0.00% 0	0.00% 0	0.00% 0	7.14% 2	3.57% 1	21.43% 6	7.14% 2	3.57% 1	7.14% 2	17.86% 5
Street Flooding	0.00% 0	0.00% 0	0.00% 0	0.00% 0	3.70% 1	0.00% 0	3.70% 1	7.41% 2	7.41% 2	7.41% 2	25.93% 7	11.11% 3	14.81% 4	18.52% 5
Wildfire	16.67% 5	3.33% 1	3.33% 1	0.00% 0	3.33% 1	13.33% 4	13.33% 4	3.33% 1	6.67% 2	3.33% 1	0.00% 0	16.67% 5	10.00% 3	3.33% 1
Extreme Heat	0.00% 0	0.00% 0	0.00% 0	0.00% 0	7.14% 2	3.57% 1	0.00% 0	3.57% 1	7.14% 2	10.71% 3	21.43% 6	10.71% 3	28.57% 8	7.14% 2

## Foster, RI Public Survey for Hazard Mitigation Plan Update

Drought	0.00% 0	3.45% 1	0.00% 0	3.45% 1	6.90% 2	3.45% 1	3.45% 1	6.90% 2	3.45% 1	13.79% 4	13.79% 4	10.34% 3	13.79% 4	17.24% 5
Earthquake	0.00% 0	0.00% 0	3.33% 1	3.33% 1	0.00% 0	0.00% 0	0.00% 0	3.33% 1	3.33% 1	0.00% 0	0.00% 0	13.33% 4	6.67% 2	13.33% 4

Q8 Looking back over the past 5 years, which statement about Foster weather do you believe to be true?

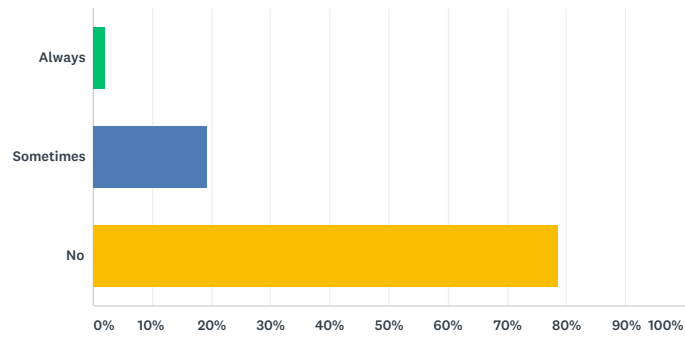
Answered: 46 Skipped: 5



ANSWER CHOICES	RESPONSES
The weather is much worse.	6.52% 3
The weather is somewhat worse.	15.22% 7
I haven't noticed a difference.	54.35% 25
The weather is somewhat better than usual (fewer storms)	17.39% 8
The weather is much better than usual.	2.17% 1
I don't know / I haven't paid attention.	4.35% 2
<b>TOTAL</b>	<b>46</b>

Q9 Does your street flood when it rains?

Answered: 47 Skipped: 4



ANSWER CHOICES	RESPONSES	
Always	2.13%	1
Sometimes	19.15%	9
No	78.72%	37
TOTAL		47

Foster, RI Public Survey for Hazard Mitigation Plan Update

Q10 If yes, please provide the street name and nearest cross street. Or tell us of a place you know that floods.

Answered: 6 Skipped: 45

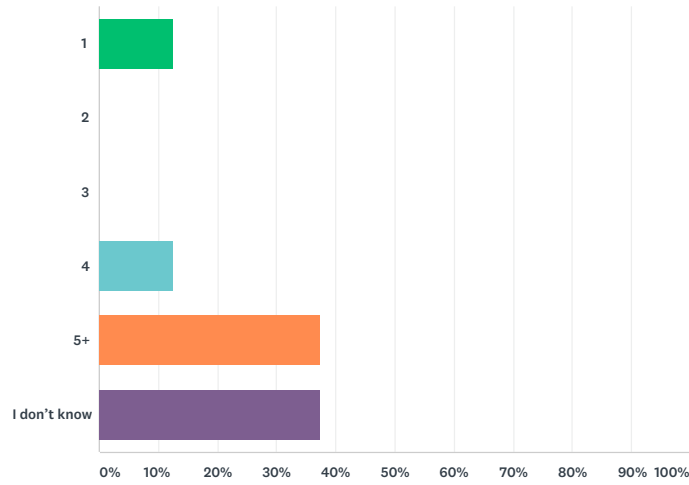
- Plainwoods Road
- Hartford Pike, Maple rock
- Danielson Pike, bottom of Dolly Cole Hill
- North Road between Boswell and South Killingly. Extremely dangerous washouts
- Foster Country Club
- Salisbury/Balcolm



Foster, RI Public Survey for Hazard Mitigation Plan Update

Q11 How many times has that street flooded in the last 12 months?

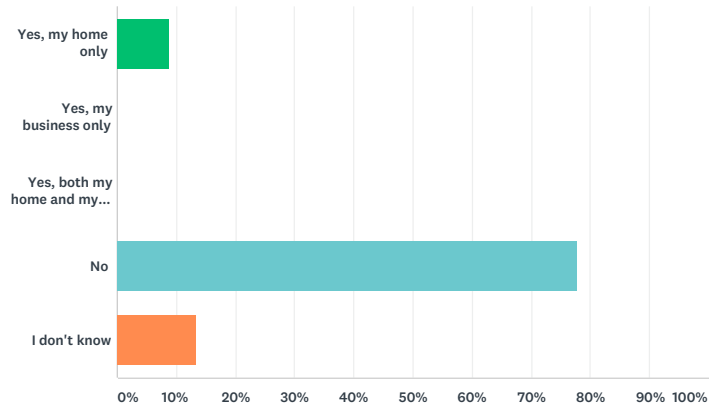
Answered: 8 Skipped: 43



ANSWER CHOICES	RESPONSES	
1	12.50%	1
2	0.00%	0
3	0.00%	0
4	12.50%	1
5+	37.50%	3
I don't know	37.50%	3
<b>TOTAL</b>		<b>8</b>

Q12 Is your home/business located in a floodplain?

Answered: 45 Skipped: 6

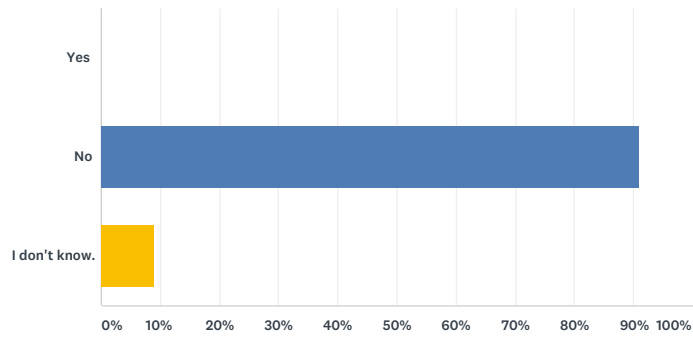


ANSWER CHOICES	RESPONSES	
Yes, my home only	8.89%	4
Yes, my business only	0.00%	0
Yes, both my home and my business	0.00%	0
No	77.78%	35
I don't know	13.33%	6
<b>TOTAL</b>		<b>45</b>

# Foster, RI Public Survey for Hazard Mitigation Plan Update

## Q13 Do you currently have flood insurance on your house?

Answered: 44 Skipped: 7

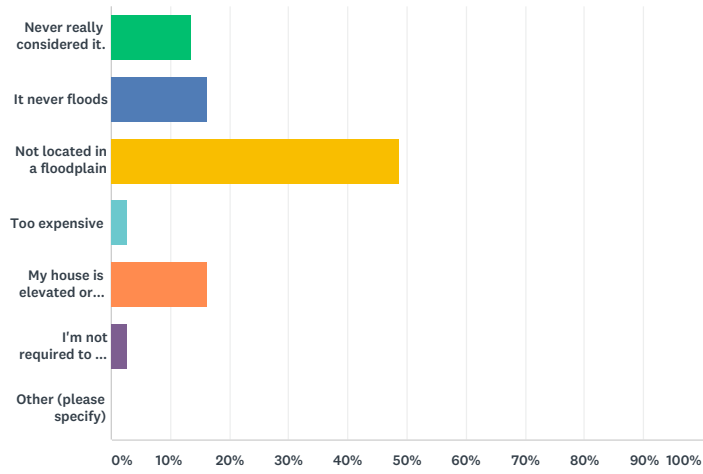


ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	90.91%	40
I don't know.	9.09%	4
<b>TOTAL</b>		<b>44</b>

Foster, RI Public Survey for Hazard Mitigation Plan Update

Q14 If you don't have flood insurance, please indicate why.

Answered: 37 Skipped: 14

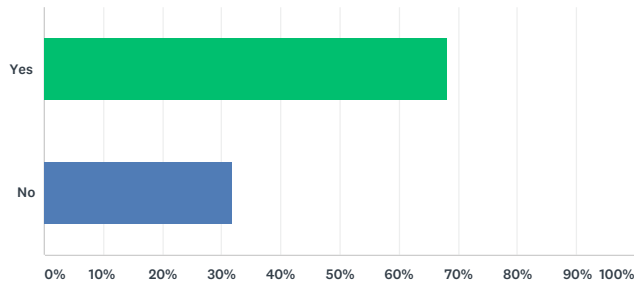


ANSWER CHOICES	RESPONSES	
Never really considered it.	13.51%	5
It never floods	16.22%	6
Not located in a floodplain	48.65%	18
Too expensive	2.70%	1
My house is elevated or otherwise protected from floodwaters	16.22%	6
I'm not required to do so (I don't have a federally backed mortgage)	2.70%	1
Other (please specify)	0.00%	0
<b>TOTAL</b>		<b>37</b>

# Foster, RI Public Survey for Hazard Mitigation Plan Update

Q15 Have you taken any actions to make your home, business or neighborhood more resistant to natural hazards?

Answered: 41 Skipped: 10



ANSWER CHOICES	RESPONSES	
Yes	68.29%	28
No	31.71%	13
TOTAL		41

Q16 If yes, please explain.

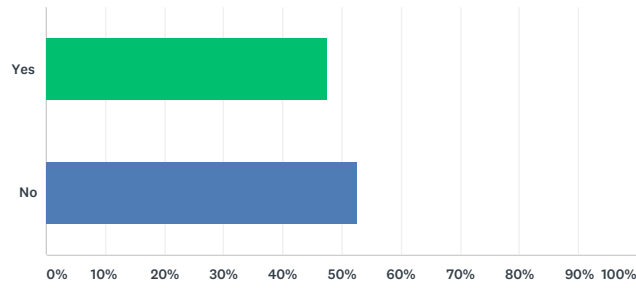
Answered: 21 Skipped: 30

- New roof
- Trimmed trees and cleared around buildings and power lines
- Water proofed basement
- Installed a generator
- Alternate heat source/wood furnace
- General grounds keeping
- Installed lightning rods
- Drains around foundation
- Large tractor with plow
- Better windows
- Installed wood boiler
- Bought and filled freezers
- French drains
- Sump pump

# Foster, RI Public Survey for Hazard Mitigation Plan Update

## Q17 Are you interested in ways to make your home, business or neighborhood more resilient?

Answered: 40 Skipped: 11

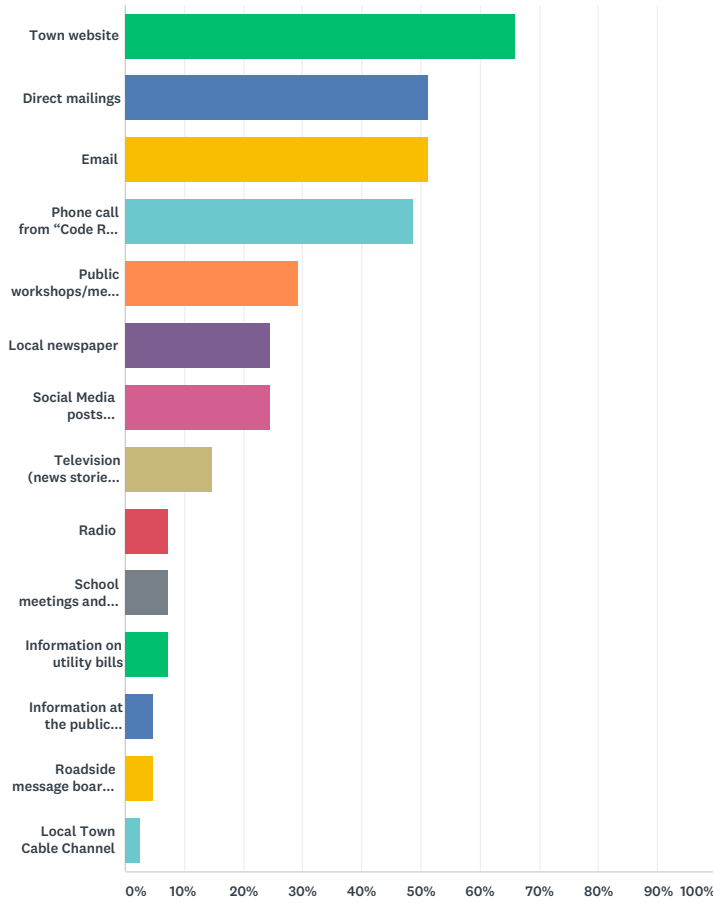


ANSWER CHOICES	RESPONSES	
Yes	47.50%	19
No	52.50%	21
TOTAL		40

# Foster, RI Public Survey for Hazard Mitigation Plan Update

Q18 How do you prefer to receive information about how to better protect your home, business, or neighborhood? Check all that apply. (Don't worry, we aren't adding you to a list.)

Answered: 41 Skipped: 10



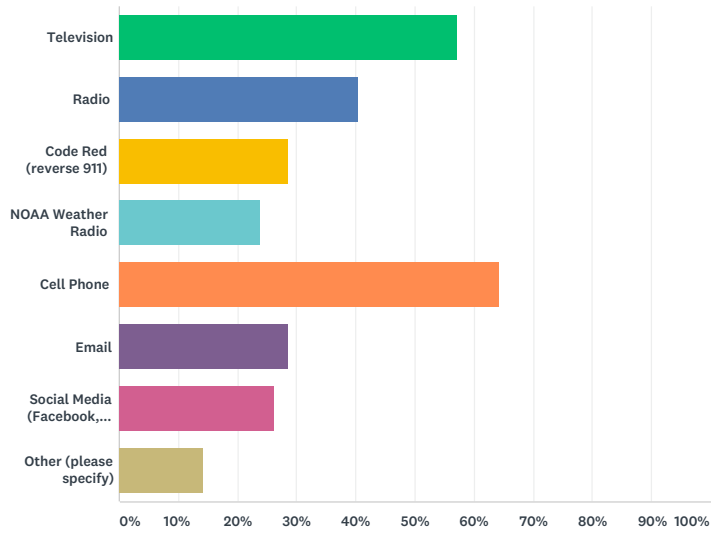
ANSWER CHOICES	RESPONSES	
Town website	65.85%	27
Direct mailings	51.22%	21
Email	51.22%	21
Phone call from "Code Red" Systems	48.78%	20
Public workshops/meetings	29.27%	12
Local newspaper	24.39%	10
Social Media posts (Facebook, Twitter, etc.)	24.39%	10
Television (news stories, Public Service Announcements)	14.63%	6
Radio	7.32%	3
School meetings and messages	7.32%	3
Information on utility bills	7.32%	3
Information at the public library	4.88%	2
Roadside message boards or billboards	4.88%	2
Local Town Cable Channel	2.44%	1
Total Respondents: 41		



# Foster, RI Public Survey for Hazard Mitigation Plan Update

## Q19 How do you currently receive weather alerts? Check all that apply.

Answered: 42 Skipped: 9

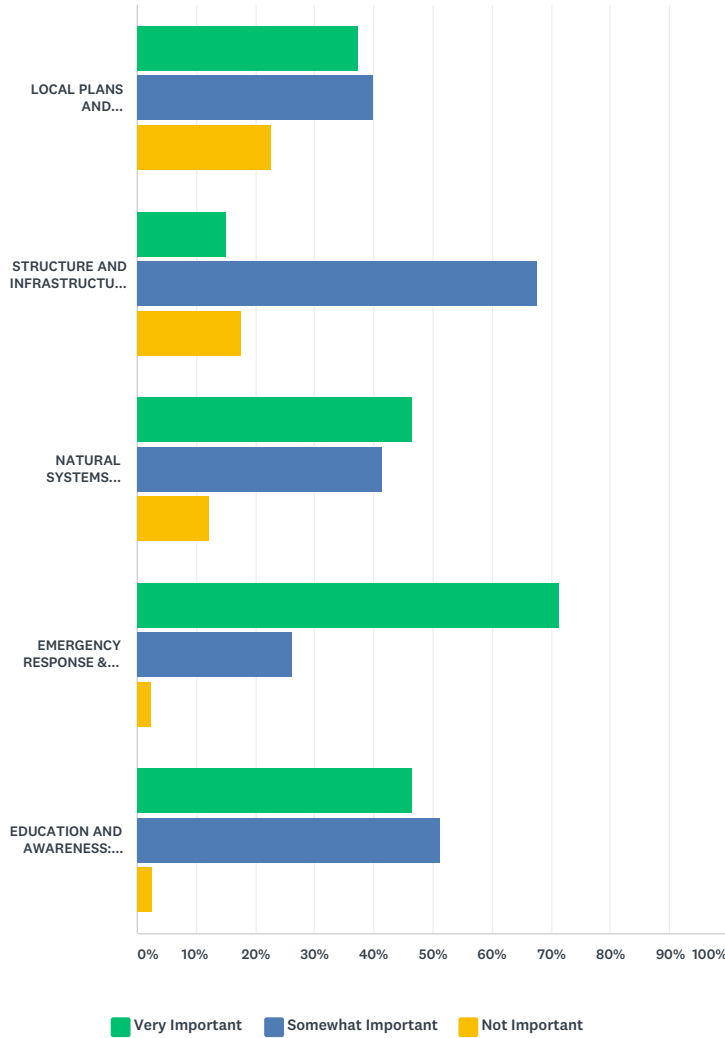


ANSWER CHOICES	RESPONSES	
Television	57.14%	24
Radio	40.48%	17
Code Red (reverse 911)	28.57%	12
NOAA Weather Radio	23.81%	10
Cell Phone	64.29%	27
Email	28.57%	12
Social Media (Facebook, Twitter, etc.)	26.19%	11
Other (please specify)	14.29%	6
Total Respondents: 42		

# Foster, RI Public Survey for Hazard Mitigation Plan Update

Q20 There are many ways Foster can reduce the risk from natural hazards. Overall, these actions fall into one of the five categories. Please indicate how important each one is for your neighborhood.

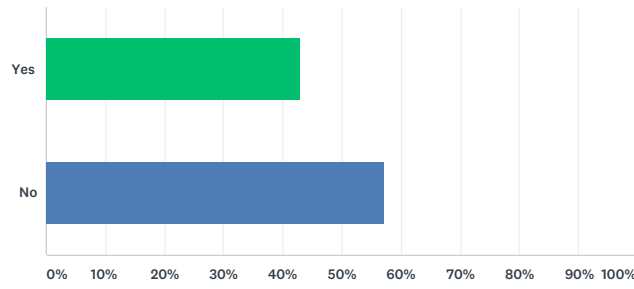
Answered: 43 Skipped: 8



	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT	TOTAL
LOCAL PLANS AND REGULATIONS: Policies to reduce the impact of hazards such as zoning, planning, and building codes.	37.50% 15	40.00% 16	22.50% 9	40
STRUCTURE AND INFRASTRUCTURE PROJECTS: Modifications of existing homes and buildings to protect them from hazards, such as elevation of electrical equipment. Engineering of structures (such as levees) to reduce the impacts of hazards.	15.00% 6	67.50% 27	17.50% 7	40
NATURAL SYSTEMS PROTECTION: Actions that not only reduce the impact of hazards but also preserve and restore natural habitats. Examples include open space preservation and wetland restoration.	46.34% 19	41.46% 17	12.20% 5	41
EMERGENCY RESPONSE & SERVICES: Actions that protect people and property during or immediately after a disaster or hazardous event. Examples include Code Red emergency warning systems, and emergency response training.	71.43% 30	26.19% 11	2.38% 1	42
EDUCATION AND AWARENESS: Citizen preparedness seminars, direct mailings, public meetings, public service announcements, Q&A sessions.	46.34% 19	51.22% 21	2.44% 1	41

Q21 Are you in favor of spending tax dollars on mitigation projects for the benefit of the entire community?

Answered: 42 Skipped: 9



ANSWER CHOICES	RESPONSES	
Yes	42.86%	18
No	57.14%	24
TOTAL		42

Q22 Please provide additional thoughts on how Foster can better prepare for and recover from the next disaster.

Answered: 12 Skipped: 39

- Seek subject matter expert from within the community. Will reduce costs
- Stand up to National Grid during widespread power outages so Foster isn't connected last.
- Spending tax dollars on mitigation projects should be evaluated wisely but can, when done properly, save money as spending proactively generally costs less than reactively.
- Identify problem areas then take corrective action to mitigate threat. Reach out to community to get a volunteer team ready to assist in response and recovery efforts.
- make sure ems and first responders are properly trained and equipped
- Wonder if it's effective to have streets that are not paved and are constantly needing to be regraded. Is it better we look to pave these troublesome roads?
- after centuries of living in this town, shouldn't there already be plans in progress ready to go? flood areas should have been mapped out by now. Tornadoes and earthquakes are totally unpredictable. ice storms and blizzards, people are trapped in their homes til it's over. that requires their own preparedness.
- Figure out how to recruit more volunteers for the fire companies that handle the disasters. Look into tax incentives for volunteers.
- Clear forest underbrush
- Foster can maintain and repair the town's infrastructure on a scheduled basis. The Council should not let things like replacing and repairing bridges, roads and equipment be neglected in order to claim they save the taxpayers money. In the long run they are endangering residents and putting the Town of Foster at risk
- Water supply information immediately available in times of power outages.

# Appendix B

## Public Notices

**NOTICE OF PUBLIC HEARING  
TOWN OF FOSTER  
TOWN COUNCIL PUBLIC HEARING**

**HAZARD MITIGATION PLAN UPDATE 2018  
JUNE 14, 2018  
7:00 PM  
FOSTER TOWN HOUSE  
180 HOWARD HILL ROAD, FOSTER RI 02825**

The Town of Foster Town Council will hold a Public Hearing on June 14, 2018 at 7:00 PM in the Foster Town House, 180 Howard Hill Road, relative to the draft Foster Hazard Mitigation Plan Update 2018. This is an update to the 2005 Hazard Mitigation Plan. Formal adoption of this 2018 plan will enable the Town of Foster to qualify for federal hazard funding.

The Foster Draft Hazard Mitigation Plan Update 2018 is available for review through the Town's website and is in hardcopy for public review at the Town Clerk's Office, Foster Town Hall, and 181 Howard Hill Road, Foster, RI 02825 during the hours of 8:30 AM to 5:30 PM Monday through Thursday.

All interested persons are invited to attend the Public Hearing and be heard. Any written comments regarding the plan should be submitted by June 11, 2018 to the Town Planner, Jennifer Siciliano, [jsiciliano@townoffoster.com](mailto:jsiciliano@townoffoster.com) Modifications to the proposal may occur without further advertising as a result of the comments received during the hearing or as a result of further study.

Individuals requiring interpreter service must notify the Town Clerk's Office at (401) 392-9200 at least 72 hours in advance of the hearing date.

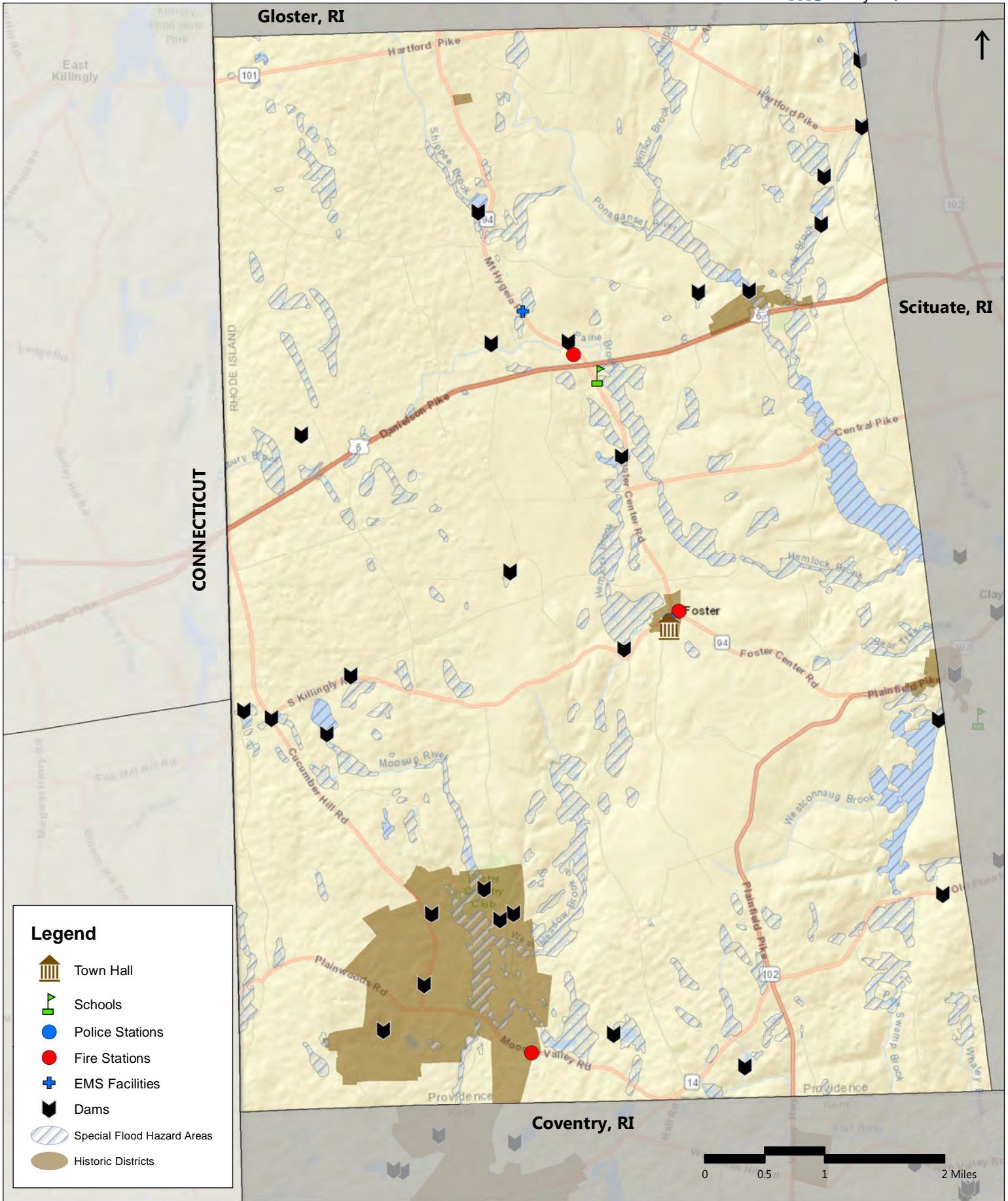
By order of the Foster Town Council  
Susan Dillon, Town Clerk

The screenshot shows the Foster Rhode Island website. At the top left is the town's logo. The main header reads "FOSTER RHODE ISLAND". A navigation bar includes links for Home, Departments, Boards / Committees, Minutes / Agendas, and Important Links. A search bar and a "FIND IT Fast" button are on the right. The main content area features a heading "HAZARD MITIGATION PLAN PUBLIC HEARING UPDATE 2018" and a sub-heading "June 14, 2018, at 7:00 p.m. in the Town House, 180 Howard Hill Road". The text below repeats the information from the notice, including the date, time, location, and details about the draft plan's availability for review. It also includes the contact information for the Town Planner, Jennifer Siciliano. At the bottom, there is a signature line: "By order of the Foster Town Council, Susan M Dillon, Town Clerk". Below this is an attachment table with one entry: "hmp\_draft\_04-16-2018.pdf" with a size of "2.09 MB".

Attachment	Size
hmp_draft_04-16-2018.pdf	2.09 MB

# Appendix C

## Resources Map



# Foster Community Resources



**Athletic Fields/ Playgrounds**

- Woody Lowen Field and Recreation Center, 16 Howard Hill Road
- Captain Isaac Paine School, 160 Foster Center Road

**Campgrounds**

- Dyer Woods Campground (Nudist), 114 Johnson Road
- Ginny-B Campground, 7 Harrington Road

**Fishing and Hunting Lodge**

- Deer Creek Farm, 59 North Road

**Golf Courses**

- Foster Country Club, 67 Johnson Road

**Parks and Natural Areas**

- Little Rhody Vasa Park
- Green Acres Pond
- Maurie Dunbar Acres
- Moosup Valley Park
- Parker Woodland
- Shippee Pond and Ponagansett River areas

As of 1/08/2018 as per the Town of Foster's website.

# Appendix D

## Additional Resources

**Technical and Financial Assistance for Mitigation  
State Resources**

**Coastal Resources Center**

University of Rhode Island  
Narragansett Bay Campus  
Narragansett, RI 02882  
(401) 874-6224

**Coastal Resources Management Council**

Stedman Government Center  
4808 Tower Hill Road  
Wakefield, RI 02879  
(401) 222-2476

**Department of Administration/Division of  
Planning**

One Capitol Hill  
Providence, RI 02908  
(401) 222-6478

**Department of Environmental  
Management**

235 Promenade Street  
Providence, RI 02908  
(401) 222-6800

**Rhode Island Banking  
Commission/Associate Director**

233 Richmond Street  
Providence, RI 02903  
(401) 222-2405

**Rhode Island Builders Association**

Terry Lane  
Gloucester, RI 02814  
(401) 568-8006

**Rhode Island Department of Business  
Regulations**

233 Richmond Street  
Providence, RI 02903  
(401) 222-2246

**Rhode Island Emergency Management  
Agency**

645 New London Avenue  
Cranston, RI 02920  
(401) 946-9996

**Public Utilities Commission**

100 Orange Street  
Providence, RI 02903  
(401) 222-3500 Ext. 153

**State Fire Marshal's Office**

272 West Exchange Street  
Providence, RI 02903  
(401) 222-2335

**State of Rhode Island Building Committee  
Office**

Building Commissioner's Office  
One Capitol Hill  
Providence, RI 02903  
(401) 222-3529

## **Technical and Financial Assistance for Mitigation Federal Resources**

### **Economic Development Administration**

Philadelphia Regional Office  
The Curtis Center  
601 Walnut Street, Suite 140 South  
Philadelphia, PA 19106-3323  
(215) 597-8822

### **Federal Emergency Management Agency Mitigation Division**

Mitigation Division  
Region I Office  
99 High Street  
Boston, MA  
(617) 223-9561

### **Small Business Administration**

10 Causeway Street  
Room 265  
Boston, MA 02222  
(617) 565-5590

### **U.S. Department of Agriculture Natural Resources Conservation Service**

451 West Street  
Amherst, MA 01002  
(413) 253-4362

### **U.S. Department of Commerce National Weather Service Forecast Office**

445 Myles Standish Boulevard  
Taunton, MA 02780 (508) 823-2262

### **U.S. Department of Housing and Urban Development**

#### **Community Development Block Grants**

Region I – O'Neill Federal Building  
10 Causeway Street  
Boston, MA 02222  
(617) 565-5354

### **U.S. Department of the Interior National Park Service**

Rivers and Trails Conservation Program  
Regional Office  
15 State Street  
Boston, MA 02109  
(617) 223-5203

### **U.S. Environmental Protection Agency**

Region I Offices  
5 Post Office Square - Suite 100  
Boston, MA 02109-3912  
(617) 565 3400

### **U.S. Fish and Wildlife Service**

Northeast Regional Office  
U.S. Fish and Wildlife Service  
300 Westgate Center Drive  
Hadley, MA 01035-9587  
(413) 253-8200

## Other Resources

### National/Regional Resources

#### **The Association of State Floodplain Managers (ASFPM)**

<http://www.floods.org>

A professional association with a membership of almost 1,000 state employees that, assists communities with the NFIP. ASFPM has developed a series of technical and topical research papers and a series of proceedings from their annual conferences. Many mitigation “success stories” have been documented through these resources and provide a good starting point for planning.

#### **The Rhode Island Flood Mitigation Association (RIFMA):**

<http://www.riflood.org>

The goal of the organization is to form a network of associates who could bring their ideas and experiences to a forum for people to share and learn from. The result of the Association is a network of floodplain managers who can improve the effectiveness and efficiency of all aspects of floodplain management in the State of Rhode Island. RIFMA regularly provides training opportunities and an annual floodplain conference.

#### **Natural Hazards Center at the University of Colorado, Boulder**

Tel: (303) 494-6818

<http://www.colorado.edu/hazards>

The Natural Hazards Center is an international/national information center that provides information on natural hazards and human adjustments to hazards and disasters, by providing information dissemination, free library and referral services, research, and an annual workshop.

#### **Flood Relief Funds**

After a disaster, local businesses, residents, and out-of-town groups often donate money to local relief funds. They may be managed by the local government, or by one or more churches. No government disaster declaration is needed. Local officials should recommend that the funds be held until an applicant exhaust all sources of public disaster assistance. Doing so allows the funds to be used for mitigation and other projects that cannot be funded elsewhere.

#### **Volunteer Organizations**

Organizations, such as the American Red Cross, the Salvation Army, Habitat for Humanity, Interfaith, and the Mennonite Disaster Service, are often available to help after disasters. Service organizations, such as the Lions, Elks, and VFW are also available. These organizations have helped others with food shelter, clothing, money, etc. Habitat for Humanity and the Mennonite Disaster Service provide skilled labor to help rebuild damaged buildings incorporating mitigation or flood proofing concepts. The offices of individual organizations can be contacted directly, or the FEMA Regional Office may be able to assist.

**New England States Emergency Consortium (NESEC)**

Lakeside Office Park

<http://www.serve.com/NESEC>

NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Brochures and videos are available on such topics as earthquake preparedness, mitigation, and hurricane safety tips.

**Institute for Business and Home Safety (IBHS)**

<http://www.ibhs.org>

An insurance industry-sponsored, nonprofit organization dedicated to reducing losses-deaths, injuries, and property damage-resulting from natural hazards. IBHS efforts are directed at five specific hazards: floods, windstorms, hail, earthquakes, and wildfires. Through its public education efforts and information center, IBHS communicates the results of its research and statistical gathering, as well as mitigation information, to a broad audience.

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