2025 Hazard Mitigation and Flood Management Plan Update

Town of North Smithfield, Rhode Island

Old Smithfield Road, December 2023.
Photo credit: *Northern RI News on the Web*

PREPARED FOR

Town of North Smithfield
Town Hall
83 Greene Street
North Smithfield, RI 02896
401-767-2200

PREPARED BY

1 Cedar Street
Suite 400
Providence, RI 02903
401-272-8100

February 2025

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RESOLUTION NO. Vol. 4 #11

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF NORTH SMITHFIELD AUTHORIZING THE ADOPTION OF THE 2025 NORTH SMITHFIELD HAZARD MITIGATION AND FLOOD MANAGEMENT PLAN UPDATE

WHEREAS, the Town of North Smithfield recognizes exposure to natural hazards that increase the risk to life, property, environment, within the 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 2025 Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in North Smithfield from impacts of future hazards and disasters; and

WHEREAS, adoption by the Town Council demonstrates its commitment to hazard mitigation and achieving goals outlined in the 2025 North Smithfield Hazard Mitigation and Flood Management Plan Update.

NOW, THEREFORE, BE IT RESOLVED that the Town of North Smithfield

1) Adopts in its entirety, the 2025 North Smithfield Hazard Mitigation and Flood Management 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 May 5, 2025

_____

XX, Town Council President, Town of North Smithfield

ATTEST: _____

XX, Town Clerk, Town of North Smithfield

Resolution

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Executive Summary

This Hazard Mitigation and Flood Management Plan (HMFMP) is a product of the North Smithfield Hazard Mitigation Committee (HMC). It has been approved by the North Smithfield Town Council, the Rhode Island Emergency Management Agency, and the Federal Emergency Management Agency in accordance with the Disaster Mitigation Act of 2000.

The HMC's overview of past natural hazard occurrences verifies that the Town is vulnerable to diverse events including, but not limited to hurricanes, Nor'easters, winter storms, flooding, high winds, brushfires, and extreme temperatures. The discussion puts the likelihood of these events into historical perspective and recognizes that although the probability of thunderstorms and lightning events may be higher; the intensity and potential impacts from less likely events such as hurricanes can be far greater.

The risk assessment portion of the plan confirms that the Town has much to lose from these events. The identified vulnerabilities include flood prone areas, streets, or infrastructure, and drainage systems, bridges, wastewater systems, water supply system, other services/utilities, communication towers, dams, critical municipal hazard response facilities, populations, businesses, schools, public buildings, recreation facilities, natural and historic resources.

To address these risks the 2025 HMFMP put forth a clear mission, a distinct set of goals, and 19 specific mitigation actions. The Town's hazard mitigation mission is to protect public health and safety and create sustainable economic growth by limiting losses to lives, public and private property, and natural resources/systems.

To implement the plan, important goals must be met. The Town's mitigation strategy was created to help protect its citizens, visitors, businesses and property from the effects of various natural hazards.

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1

Introduction

Plan Purpose

The purpose of the North Smithfield Hazard Mitigation and Flood Management Plan Update is to set forth guidelines of short-term and long-term actions, which will reduce the actual or potential loss of life or property from natural hazardous events such as hurricanes, Nor'easters, flooding, and high wind. 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 its losses and vulnerabilities relating to natural hazards.

By planning ahead, North Smithfield can minimize the economic and social disruption that may result from natural disasters (destruction of property, loss or interruption of jobs, and the loss of businesses). Preventive measures will reduce the impact and reduce the cost of post disaster cleanup.

Hazard Mitigation and its 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 (PDM), Building Resiliency Infrastructure in Communities (BRIC) program, and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP) or 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.

A **Natural Hazard** is defined as an extreme natural event. **Natural Disasters** occur when these extreme natural events come into contact with people and property.

Natural hazard mitigation is any sustained action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of natural hazards.

Natural Hazard mitigation planning is a process undertaken by a community to analyze the risk from natural disasters, coordinate available resources, and implement actions to minimize the damage to property, and injury or loss of life of its citizens before disaster occurs.

This Plan recommends actions and policies for the Town of North Smithfield to minimize the social and economic loss of 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. To protect present and future structures, infrastructure and assets and to minimize the social and economic hardships, the Town of North Smithfield implements the following general actions and policies:

- Town's Comprehensive Community Plan
- Town's Capital Improvement Plan
- Stormwater Management Plan
- Various Watershed Plans
- Local building code review

The Town of North Smithfield 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. The Town's Comprehensive Plan (2019) addresses land use, housing, economic development, natural resources, historic, and cultural resources, open space and recreation, Blackstone Heritage Corridor, services and facilities, and energy, natural hazards, and climate change. While the entire hazard mitigation plan will not be formally incorporated into the next revision of the Comprehensive Plan, certain, applicable mitigation actions will be incorporated during the update process. The Town recognizes coordination between the HMFMP and the Comprehensive Community Plan to be beneficial 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 Division of Statewide Planning.

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 is endorsing a proactive planning approach focused on sustainability, whereby the Town of North Smithfield 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/injuries, 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 establishes funding priorities. The formal adoption and implementation of this plan will allow the Town of North Smithfield 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 Assistance Program (PDM); the Building Resilient Infrastructure in Communities (BRIC) Program; the Flood Mitigation Assistance (FMA) Program; and the Hazard Mitigation Grant Program (HMGP). Money spent today on preventative measures can significantly reduce the cost of post-disaster cleanup tomorrow.

Mission Statement and Goals

The Town of North Smithfield will protect public health and safety and create sustainable economic growth by limiting losses to lives, public and private and private property, and natural resources/systems.

Goals

This mitigation strategy is adopted by the Town of North Smithfield to present actions which help protect its citizens, visitors, businesses and property from the effects of various natural hazards. It is the intent of the Town of North Smithfield to:

1. Protect public health, safety and welfare; minimize social dislocation and distress due to impacts from natural hazards.
2. Prioritize the allocation of resources for mitigation actions that benefit underserved and disadvantaged communities, especially those in high-risk areas.
3. Reduce property and environmental damages caused by natural disasters such as high winds, flooding, and brushfires.
4. Reduce economic losses and minimize disruption to local businesses due to natural hazards.
5. Protect the ongoing operations of critical facilities during and after a storm/event.

6. Expedite recovery disaster mitigation efforts during the recovery phase.

Background

The Town of North Smithfield is located in the northeast section of Rhode Island, bordered by the Town of Smithfield to the south, City of Woonsocket to the northeast, Burrillville to the west and the state of Massachusetts to the north. Incorporated in 1871, North Smithfield includes the historic villages of Forestdale, Primrose, Waterford, Branch Village, Union Village, Park Square, and Slatersville. North Smithfield has an area of approximately 24.7 square miles.

Figure 1 Locus Map

The Town is served by the following major highways: Interstate 295, RI Route 5, RI Route 7, RI route 146, RI Route 102, RI Route 104 and RI Route 146 A.

North Smithfield has an estimated population of 12,535,[1] which puts it at #27 of the 39 cities and towns in Rhode Island for overall population count.

"North Smithfield is a rural, mostly residential community that combines traditional small-town New England charm with modern-day development patterns of retail and services, especially along the town's arterial and collector streets. Automobile dependence, highway retail development, and a more regional economy have given rise to more spread-out residential and commercial developments, allowing individuals to live further from employment, retail and other service centers. This pattern of development has led to less compact communities, especially in rural areas."[2]

History

The first neighborhood of North Smithfield was Union Village which initially flourished as a stagecoach stop along Great Road (146A). Subsequent small-lot residential growth within and in areas to the north and south of Union Village represented outward suburbanization of Woonsocket which spilled into North Smithfield.

Slatersville, the Nation's first planned mill village, was established in conjunction with the Slatersville Mill along the Branch River. Forestdale, Branch Village and Waterford were all Branch River valley communities near water-powered mills. Industry is still clustered along or near the Branch River.

1 United States Census Bureau, American Community Survey 2022 5-year estimate.
2 Town of North Smithfield Rhode Island, Comprehensive Plan 2019.

Although the villages had a few stores and shops to serve the mill workers, North Smithfield never developed what might be considered a downtown. Woonsocket served this function and at one-time trolley cars extended out to North Smithfield from downtown Woonsocket.

Demographics[3]

The Town of North Smithfield is a rural residential inland community with a population of 12,525. North Smithfield's median age is on average, higher than the State average of 40. The median age of our residents is 47.2.

Approximately 22% of the population is over 65. The population in North Smithfield is predominantly white at 94%, Hispanic or Latino 3%, Asians 1%, Two or more races1%.

The 2022 American Community Survey 5-Year Survey Estimates reported an estimate of 5,297 housing units (5,085 of which are occupied) which is an increase of 4.5% from the 2010 Census count. Approximately 11% of the housing units were built before 1939. Approximately 76% of the housing units are single family detached or attached (condo). The remaining 24% of the housing units are considered multi-family. The greatest concentration of high-density residential land use is east of Route 146, in the Branch Village and Union Village neighborhoods located in the northeast section of Town.

There are no identified disadvantaged or Environmental Justice Focus Areas in North Smithfield. Applicable census tracts would need to meet the following specific criteria[4]:

1. Annual median household income is not more than sixty-five percent (65%) of the statewide annual median household income; or
2. Minority population is equal to or greater than forty percent (40%) of the total population; or
3. Twenty-five percent (25%) or more of the households lack English language proficiency; or
4. Minorities comprise twenty-five percent (25%) or more of the population and the annual median household income of the municipality in the proposed area does not exceed one hundred fifty percent (150%) of the statewide annual median household income.

Economic Conditions

North Smithfield's economic success is largely dependent on residential taxes. Since 2010, the commercial tax revenue has been slowly growing, which helps alleviate the tax burden to residents.

Key industries in North Smithfield include retail, health care and social assistance, accommodation and food services, and manufacturing.[5]

3 For the purpose of this element, the most comprehensive data set is from 2020 United States Census, 2021 ACS 5-Year Estimates http://censusreporter.org/

4 RIDEM Environmental Justice https://dem.ri.gov/environmental-protection-bureau/initiatives/environmental-justice and Climate and Economic Justice Screening Tool https://screeningtool.geoplatform.gov/en/#10.36/41.8778/-71.5744

5 Rhode Island Department of Labor & Training, Quarterly Census of Unemployment Covered Employment and Wages, North Smithfield, 2023 Third Quarter. https://dlt.ri.gov/labor-market-information/data-center/employment-wages-industry-qcew

In 2022, the unemployment rate in North Smithfield was 2.5% which is slightly lower than the state average of 3.3% in 2022. Unemployment rates statewide have been improving since the average of 15.8% in the second quarter of 2020 (COVID pandemic).[6]

About 77% of the 5,087 occupied housing units in North Smithfield are owner-occupied (compared to 63% for the state), and median household income of $96,677 is higher than the statewide median household income of $74,489. Five percent of the population in North Smithfield has income below the poverty level.

Table 1 Demographic Changes

	2010	2022	% Change
Housing Units (total)	4,674	5,297	+13%
Population	11,967	12,535	+5%
Owner-occupied housing units	3,520	3,917	+11%

Government

The Town of North Smithfield is governed by an elected Town Council with five members, elected every two years. The Town Administrator, elected every four years, is responsible for the execution of laws and the administration of Town government. The Town Council is also responsible for adopting the current Hazard Mitigation and Flood Management Plan Update.

Land Use Patterns

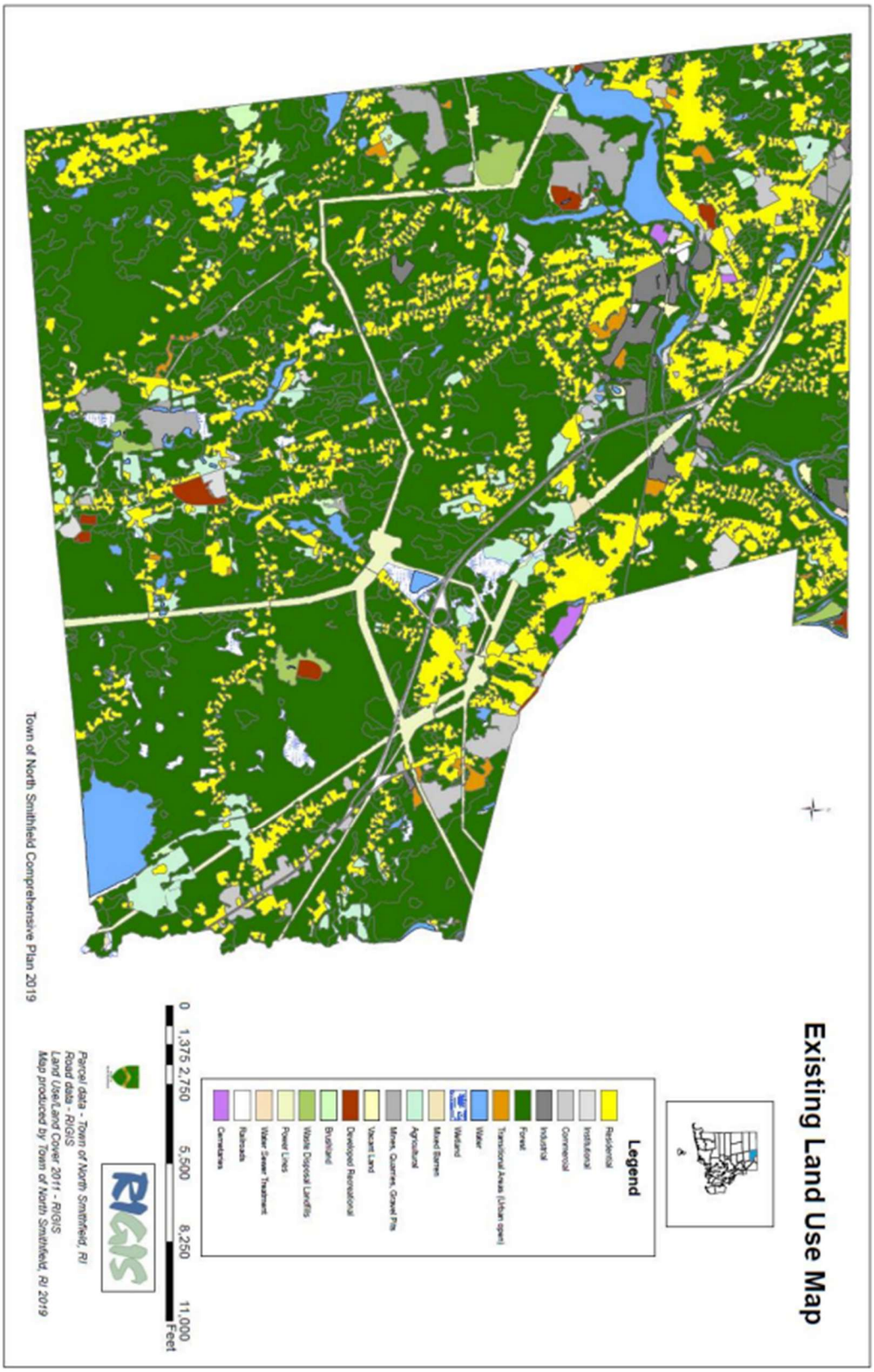
Nearly 83% of North Smithfield's taxed land is used for residential purposes. There are about five clusters of commercial/retail activity in North Smithfield: highway-oriented businesses along the non-limited access section of Route 146 between the 146A merge and the Lincoln Town line; Park Square area of Eddie Dowling Highway (Route 146A) which is a retail district straddling the North Smithfield/Woonsocket municipal lines; Branch Village area along Route 146A near St. Paul Street serving both local residents and transients; Carpenter's Corner (North Main Street and Route 146A) which is the locus of a shopping center anchored by a supermarket; and the Route 102/South Main Street intersection with highway-oriented business activities..

Small-lot housing, predominantly single-family with scattered two-family units, tends to be concentrated in and around the old mill villages and adjacent to the Woonsocket line. In contrast, the westerly and southerly sections of Town retain a rural and rural-residential character furthered by larger lot zoning requirements. Except for the industrial zone along North Smithfield Industrial Drive and the commercial development along Route 146 in the Sayles Hill Road area, virtually the entire land area to the south of the Providence and Worcester Railroad and to the west of Route 146 is zoned for residential development.[7]

6 State of Rhode Island Department of Labor and Training, Unemployment Rate/Labor Force Statistics Unemployment Rate/Labor Force Statistics (LAUS) | RI Department of Labor & Training, accessed February 2023.

7 Town of North Smithfield Rhode Island, Comprehensive Plan 2019.

Figure 2 Land Use Map



Roads and Bridges

The roads in North Smithfield have defined land use patterns. "The predominant east-west traffic circulation is served by: Main Street, School Street, St. Paul Street, Pound Hill Road, Sayles Hill Road and Greenville Road which are the principal east-west roadways. Although Victory Highway (Route 102) serves east-west flows in North Smithfield, it is also a north-south road passing through the more rural sections of northern Rhode Island. The major north-south routes in town are Route 146 and 146A, Providence Pike, Douglas Pike and Black Plain Road."[8]

Dams

In 2023 the Department of Environmental Management (DEM) identified twenty-one dams in the Town of North Smithfield. The high hazard dams are: Slatersville Reservoir Upper Dam, Slatersville Reservoir Middle Dam, Woonsocket Reservoir #3, and Forestdale Pond Dam. The Slatersville Reservoir Lower Dam and the Todd's Pond Dam are significant hazard dams. The remainder are low hazard dams.

Over time dams weaken and the risk of dam failure is greater than ever. Development continues in locations downstream from dams impacting the functionality of the dams. In order to mitigate life and property loss, dam owners are instructed to follow public policy and must use direct and indirect ways to achieve safety.

High Hazard Dam – where failure or misoperation will result in probable loss of human life.

Significant Hazard Dam – where failure or misoperation will result in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare.

Low Hazard Dam – where failure or misoperation will result in no probable loss of human life and low economic losses.

Should a significant hazard dam become a high hazard dam, the Town will consider mitigation actions to reduce long-term vulnerabilities.

Utilities

Drinking water is supplied to North Smithfield residences and businesses by a combination of individual wells and community systems which draw from Reservoir #1 and #3 in North Smithfield. The systems are: the municipally-owned Slatersville Water Supply (RI 1614615), operated by the Town gets its water directly from the City of Woonsocket to serve the Slatersville and Forestdale neighborhoods totaling 469 residential and 65 commercial customers; the City of Woonsocket water system providing service to Union Village and adjoining development and in the Mendon Road/Rhodes Avenue area; and the Town of Blackstone Water System serving the Waterford neighborhood. [9] This fragmented water supply may hinder efficient future development.

The Town of North Smithfield sewer system exports its waste to the City of Woonsocket at the Woonsocket Wastewater Treatment Plant (Operated by CH2M Hill).

8 Town of North Smithfield Rhode Island, Comprehensive Plan 2019.
9 Town of North Smithfield Rhode Island, Comprehensive Plan 2019.

RI Energy is responsible for delivering natural gas and electricity throughout town. While regional gas, electric, and sewer utilities are regularly maintained by the entities that own them, the Town's public utility infrastructure is maintained as needed.

The Town of North Smithfield's communication equipment is located throughout the town. The emergency communication systems are located on the Mowry Tower and the adjacent monopole. Private cellular towers are also located throughout the town.

Water Resources

Water resources including freshwater bodies and wetlands are important for the community. Wetlands provide a value to prevent flooding, purify the groundwater, and as a wildlife habitat.

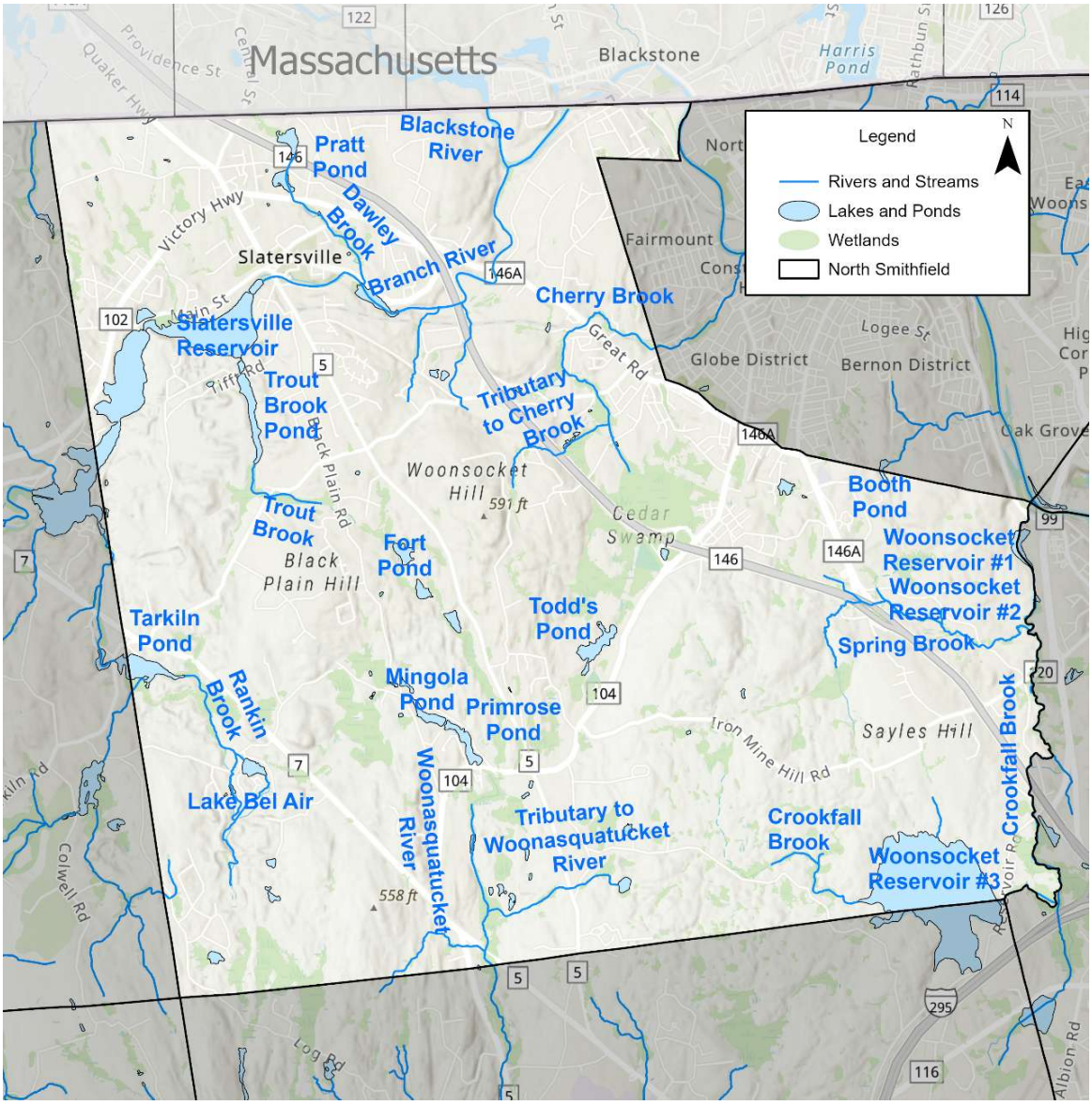
North Smithfield is located within the drainage system of three major rivers. The northern portions of the Town drain into the Branch River which joins the Blackstone River in the northeastern section of Town. In the southwest corner, several streams including those flowing through Primrose Pond, combine to form the headwaters of the Woonasquatucket River. In the eastern section of the community both the Cherry Brook and Crookfall Brook systems flow to the east and into the Blackstone River in Woonsocket.

The Blackstone River Watershed drains into two reservoirs (#1 and #3) located in North Smithfield serving the Woonsocket Water Supply. Risk assessments of the watershed were undertaken in 2004 by the Department of Health and URI Cooperative Extension. Based on an analysis of existing uses and zoning, the Woonsocket water supplies are "moderately susceptible to contamination."

Rivers and streams running through the watershed carry storm water drainage and drainage from impervious surfaces such as roadways and parking lots. To protect the groundwater reservoirs and streams, the North Smithfield Zoning Ordinance limits the amount of impervious surface in new development and specifies no impervious surface within 100 feet of a freshwater wetland.[10]

10 Town of North Smithfield Rhode Island, Comprehensive Plan 2019.

Figure 3 Water Resources



Forest and Open Space

Town open space and recreational facilities owned and managed by the State is limited to 4.2 acres at the Slatersville Reservoir Fishing Access area, 7.5 acres at the North Smithfield Wildlife Marsh, and the 117 acres at the Blackstone Gorge.

The designation of the Woonasquatucket and Blackstone Rivers as American Heritage Rivers has provided opportunities for recreational activities including the development of bikeways from Providence. The RI Rivers Council has designated two groups to serve as Watershed Councils in North Smithfield, and both, the Woonasquatucket and Blackstone River Watershed Councils have already begun assisting the Town with protecting and preserving the watersheds in which these rivers are located.

North Smithfield's open space and recreation areas enhance the Town's character and provide for the passive and active recreational needs of residents.

Cultural and Historic Resources

Union Village and Slatersville are both Town designated historic districts, and both are listed on the National Register of Historic Places. The following areas are listed on the National Register of Historic Places: Forestdale, Tyler Mowry House, William Mowry House, Old Smithfield Road Historic District, Slatersville Historic District, Three Dog Archaeological Site, Smith-Andrews-Taft-Todd Farm, Peleg Arnold Tavern, and Union Village Historic District.

Areas of cultural significance include Grange Road, Nipsachuck, Primrose Pond, Wright's Dairy Farm, Blackstone River/High Rocks Natural and Historic Area, Cedar Swamp Natural and Historic Area, Mattity or Mattetokomitt Meadow Natural and Historic Area, and Woonsocket Reservoir #3 Natural and Historic areas.

Development Trends Since the 2019 Plan

The years 2019-2022 were dominated by construction of solar fields in North Smithfield.

- NextSun (Great Road) 1.1 mW
- Pomham Solar (Off Iron Mine Road) 2.8 mW
- TPE King Solar (Old Oxford Road) 6.2 mW
- Green Development (Iron Mine Road) 38.4 mW- The largest ground-mounted solar installation in the state.

Existing developments have continued building out slowly and there has been a slight increase in new housing with rental condos at Dowling Village.

The Rhode Island Department of Transportation's Route 146 improvement project continued in 2024, enhancing traffic safety and efficiency through North Smithfield and neighboring towns.

New England Truck Solutions acquired 27 acres of land and expanded their facility to construct a new 9,000 square foot commercial facility to supplement the existing auto repair facility.

Pacheco Park in the Slatersville neighborhood has been improved to deter vandalism.

School buildings and grounds have been updated.

The Town invested in various road surface improvements at Pound Hill Road, Mattity Road, Laurel Lane, and Rocky Hill Road.

None of these changes have greatly affected the town's vulnerability to the identified hazards, nor their ability to respond to them.

2

Planning Process

Overview

The Town of North Smithfield initiated the HMFMP planning effort in 2024 at the recommendation of the Town's Planning Director. This Hazard Mitigation and Flood Management Plan Update is the result of a dedicated group of individuals working for nine months identifying natural hazards and proposing ways to improve North Smithfield's resiliency. The draft plan was made available for public comment before it was submitted to the State and FEMA for review.

North Smithfield Hazard Mitigation Committee

This updated Hazard Mitigation and Flood Management Plan (HMFMP) is a product of the North Smithfield Hazard Mitigation Committee (HMC). The HMC was comprised mainly of municipal employees, some of which are also local residents. Also serving on the HMC were a local grocery store owner, a local resident, and the State Hazard Mitigation Officer. The Planning Department reached out to other business owners but had a difficult time finding members of the public available to participate in this process. There are no major universities or employers in North Smithfield. Committee members met monthly and were given an opportunity to comment on the draft plan before it was posted for public comment. A sign-in sheet was completed at each meeting, helping the Town document participation. See Chapter 7 for recommendations on enhancing the breadth of HMC. The 2024 Committee members include:

- Peter Branconnier, North Smithfield Emergency Management Director*
- Mark Carruolo, North Smithfield Town Planner, NFIP Coordinator
- David Chartier, North Smithfield Fire Chief*
- Leo Cote, North Smithfield Building Inspector
- Rae-Anne Culp, RI Emergency Management Agency, State Hazard Mitigation Officer
- Bill Descoteaux, North Smithfield Water/Sewer Superintendent*
- Thomas Dybala, North Smithfield Deputy Fire Chief*
- Michael Fernandez, Owner of Brigido's Market
- David Hemendinger, North Smithfield Resident*
- Tim Lafferty, North Smithfield Police Chief
- Ellen Lamoreaux, North Smithfield Police Captain
- Bobbi Moneghan, North Smithfield Assistant Planner/GIS Analyst

- Raymond Pendergast, North Smithfield Department of Public Works Director*
- Alan Sepe, North Smithfield School Facilities Manager
- Dan Taylor, North Smithfield Emergency Management Staff*
- Paul Zwolenski, former North Smithfield Town Administrator*

* Denotes North Smithfield resident.

The Planning Process

This 2024 HMFMP update is the result of a 7-step process that was initiated in October 2023 with the establishment of the HMC. Membership of the HMC consisted of town staff, the State Hazard Mitigation Officer, a local business owner, and a North Smithfield resident, by invitation from the Planning Director. 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 HMC on November 16, 2023. The HMC met in person during working hours every month at the Town Council chambers. It was decided that this location is the most accessible to all available participants and is located less than one mile from the RIPTA Slatersville bus stop.

The Town's previous plan was dated 2019, so the first meeting focused on re-ranking hazards and discussing the process for updating the plan. Also 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 Town's website. The survey received 118 responses, most of which were residents. See Appendix A for survey results.

Step three began with the HMC meeting on January 11, 2024. After reviewing the hazards of concerns and survey results, the HMC identified critical infrastructure and community assets within the town. Fifteen areas of vulnerability were identified: flood prone streets or infrastructure; bridges; wastewater; water supply; other services/utilities; communication towers; dams; critical municipal hazard response facilities; populations; businesses; schools; recreational facilities; natural resources; and historic resources.

During this early phase, the Town's consultant reviewed the existing Comprehensive Plan, 2019 Hazard Mitigation Plan, local ordinances, and gathered information on current infrastructure projects going on within the town. Actions and assessments from the prior Hazard Mitigation Plan were important building blocks upon which to update this Plan. See Section 5 for how these plans were utilized during the planning process.

Current town capabilities were discussed at the meeting on February 7, 2024. Many different departments, committees, and programs already engage in activities that help North Smithfield 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. At the March 7, 2024 meeting, the HMC reviewed goals and mitigation items that were proposed in the 2019 plan. The incomplete actions that were still important were rolled into the list of actions for this 2024 plan update. The HMC also began to brainstorm new mitigation actions at this meeting.

Step five was begun at the April 11, 2024 meeting where the group continued with proposing new actions, establishing action timelines, costs, and identifying responsible parties.

Step six focused on the prioritization of the mitigation actions. This occurred towards the end of the April meeting once the HMC had drafted a list of mitigation actions. 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 North Smithfield Town Council, and the general public for review and comment. See *Public Input* below.

Table 2 below provides a summary of the Committee's meeting dates and the activities that they conducted:

Table 2 Committee Meetings

Date	Meeting Summary
11/16/2023	› Kick-off meeting with new contractor, VHB. HMC discussed the plan purpose and hazards of concern. Reviewed survey questions.
01/04/2024	› Hazards survey posted online.
01/11/2024	› The HMC reviewed the hazards of concern and listed critical infrastructure and community assets.
02/07/2024	› Review of community assets and discussion of current capabilities. › Review of 2019 goals.
02/07/2024	› Review status of 2019 actions.
03/07/2024	› Mitigation action discussion
04/11/2024	› Finalized mitigation actions and discussed prioritization
07/16/2024	› Plan review by the HMC
09/05/2024	› Distributed to Planning Board and Town Council
09/05/2024	› Posted for public comment and sent neighboring towns
09/12/2024	› Advertisement in newspaper and newsletter posting.
10/07/2024	› Received comments from public and Town Council
10/17/2024	› Sent to RIEMA for review
	› Sent to FEMA for approval
	› Plan adopted by the Town Council

Public Input

This hazard mitigation plan benefits from various distinct types of public input strategies that were utilized by the HMC during the drafting process and prior to its adoption by the Town Council. Public input for the updated North Smithfield Hazard Mitigation and Flood Management Plan was primarily collected through a public survey, public meetings and an invitation to comment. The HMC concluded that these methods would be the most effective in reaching the largest number of participants. While North Smithfield is home to a diverse population, there are no significant concentrations of underserved or non-English speaking

communities. Therefore, additional efforts to develop a specific outreach strategy were deemed unnecessary.

Early in the planning process, the HMC 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 the course of four weeks, 118 individuals participated in the survey. Not surprisingly, most were concerned hurricanes/ nor'easters, winter weather, and high winds. The survey also provided the HMC with a list of problematic areas that are susceptible to flooding. The HMC used the input from the survey to focus their mitigation planning efforts. See Appendix A for the survey results.

The 2024 HMC included town residents and municipal employees. The HMC'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 2025 Hazard Mitigation and Flood Management Plan.

The HMC drafted the plan through a series of monthly committee meetings before soliciting additional public input on the draft plan.

Another public input strategy was geared toward the general public as opposed to specific stakeholders. Town Council also received the Hazard Mitigation and Flood Management Plan Update for review.

Starting on September 7, 2024 during the draft review portion of the plan development, an electronic copy of the draft 2025 HMFMP was available for review on the Town's website and available in hard copy at the Town Hall. A press release announcement on the Town's website and in the local newspaper invited people to review and comment on the Plan during the two-week review period. Reviewers were encouraged to read the document and send any questions or suggested edits to the Planning Department.

The local planners in neighboring communities of Burrillville, North Smithfield, and Woonsocket were given copies of the plan for review. No comments were received.

The public comment period concluded on October 7 during the Town Council meeting which included a chance for the public to comment on the Hazard Mitigation Plan. This opportunity was advertised in the Town Council's meeting agenda. During this four-week public review period, no comments were received from the general public. The Town Council suggested that the Hazard Mitigation Committee meet bi-annually and report back to the Council. There were no substantial changes recommended.

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

3

Natural Hazards

Hazards of Concern

The 2024 State of Rhode Island Hazard Mitigation Plan, and the North Smithfield 2019 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 North Smithfield Hazard Mitigation Committee.

Table 3 Hazards Identified by the North Smithfield Hazard Mitigation Committee

Natural Hazards Identified by the State	Identified by the North Smithfield HMC	Notes
Dam Failure	✓	
Drought	✓	
Earthquake	✓	
Extreme Temperatures	✓	
Flood	✓	
Sea Level Rise	No	North Smithfield is not a coastal community.
Severe Thunderstorms/Lightning	✓	
Severe Winter Weather	✓	
Tornado	✓	
Tropical/Extratropical Storms (i.e., Hurricanes and Nor'easters)	✓	
Wildfire/Brushfire	✓	

The HMC also reviewed impacts from high winds and electromagnetic pulses.

Other natural hazards such as landslides, avalanches, volcanic activity, and tsunamis are not likely in North Smithfield due to the flat topography and lack of appropriate landforms. Although the Covid-19 Pandemic was a declared biological disaster affecting the State and Providence County from 2020 through 2023, it is not covered in this natural hazard plan. Lessons learned from the pandemic are being caried over to respond to and mitigation future disasters of all types.

History of Past Disaster Declarations in Providence County

Table 4 summarizes both the State Executive Order (EO) and Federal (DR) natural disasters declared in Rhode Island which have impacted North Smithfield.[11]

Table 4 State and Federal Disasters

Incident Date (Start)	Name	Extent	Incident Type
01/09/2024	DR-4766-RI EO 24-03	Providence, Kent, and Washington Counties	Severe Storms and Flooding
12/17/2023	DR-4765-RI EO-23-10	Providence, Kent, and Washington Counties	Severe Storms and Flooding
09/10/2023	DR-4753-RI	Providence County	Severe Storms, Flooding, and Tornadoes
01/28/2022	DR-4653-RI EO 22-10	Statewide	Severe Winter Storm and Snowstorm
08/20/2021	EM-3563-RI EO 21-88	Statewide	Hurricane Henri
01/26/2015	DR-4212-RI EO 15-02	Statewide	Severe Winter Storm and Snowstorm
02/08/2013	DR-4107-RI	Statewide	Severe Winter Storm and Snowstorm
10/26/2012	DR-4089-RI	Statewide	Hurricane Sandy
10/26/2012	EM-3355-RI	Statewide	Hurricane Sandy
08/27/2011	DR-4027-RI	Statewide	Tropical Storm Irene
08/27/2011	EM-3334-RI	Statewide	Tropical Storm Irene
03/12/2010	EM-3311-RI	Statewide	Severe Floods and Flooding
03/12/2010	DR-1894-RI	Statewide	Severe Floods and Flooding
01/22/2005	EM-3203-RI	Statewide	Record Snow
02/17/2003	EM-3182-RI	Statewide	Snowstorm
01/07/1996	DR-1091-RI	Statewide	Blizzard
03/13/1993	EM-3102-RI	Statewide	Blizzards, High Winds, Record Snowfall
08/19/1991	DR-913-RI	Statewide	Hurricane Bob
09/27/1985	DR-748-RI	Statewide	Hurricane Gloria
02/16/1978	DR-548-RI	Statewide	Snow, Ice
02/7/1978	EM-3058-RI	Statewide	Snowstorms
08/20/1955	DR-39-RI	Statewide	Hurricane, Flood
09/02/1954	DR-23-RI	Statewide	Hurricane Carol

11 Rhode Island Governor's Archive of Executive Orders https://governor.ri.gov/executive-order-archive; and Federal Emergency Management (FEMA) declared disasters in Rhode Island https://www.fema.gov/disaster/declarations. Note that the Rhode Island Governor's Archive only goes back as far as 2015.

Methodology

During the beginning phases of the planning process, the Hazard Mitigation 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	
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.
Damage Extent	
Low:	Some local property damage not town wide, minor injuries/ loss of life
Medium:	50% of property could be damaged and possible injuries/ loss of life
High:	Major town wide property damage, injuries and loss of life.
Level of Concern/Risk Rank	
Developed by the HMC to rank the various hazards based on frequency and damage potential.	
Low:	Not expected to occur with any frequency, damages will be limited.
Medium:	Will occur within the next 10 years but the Town has resources to reduce risks.
High:	Expected to occur within the next 5 years and is a major concern for the town. Town-wide impacts.

Based on a combination of probability of future occurrence, 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 North Smithfield, ranked from a high concern to low concern.

Table 5 Hazards Ranked

Hazard	Level of Concern/Risk Rank
Nor'easter	High
Hurricane	High
Severe Winter Storms and Ice	High
Flooding (heavy rain, flash, riverine)	Medium
High Wind	Medium
Extreme Heat	Medium
Extreme Cold	Medium
Brushfires	Medium/Low
Lightning/Thunderstorms/Hail/Microburst	Low
Drought	Low
Dam Failures	Low
Tornadoes	Low
Earthquakes	Low
Electromagnetic pulses/solar flare	Low

In this HMFMP, climate change is treated as an ongoing amplifier to the identified natural hazards, not profiled as an independent hazard. "Extreme weather events have become more frequent during the past half-century, and this trend is projected to continue.[12] For instance, more frequent intense precipitation events may translate into more frequent flooding episodes. The National Climate Assessment and Development Committee has documented that the average temperature across the United States has increased 1.5°F since 1895, with the majority of the increase since 1980. Weather events have and will continue to become more intense and frequent and will result in health and livelihood related impacts such as water supply, agriculture, transportation, and energy. The impact of dynamic storm events includes, but is not limited to, more frequent and intense heat waves, increases in ocean and freshwater temperatures, frost-free-days, heavy downpours, floods, sea level rising, droughts, and wildfires." [13]

Climate change impacts will be mentioned for each hazard.

The following subsections are organized by the level of risk as identified in **Table 5** Hazards Ranked.

Nor'easters

Description

A strong low-pressure 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 offshore, 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[14].

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 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

12 IPCC, 2012 - Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (Eds.) Available from Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU ENGLAND, 582 pp.

13 National Climate Assessment and Development Advisory Committee (NCADAC) January 2013 Draft Climate Assessment Report. http://ncadac.globalchange.gov/

14 Hersher, et al. An East Coast Winter Storm Climatology. Northeast Regional Climate Center, Cornell University, Ithaca, NY, 2001.

effects, the Beaufort Wind Scale is a system that relates wind speed to observed conditions at sea or on land (See **Table 11**). The snow impact of a Nor'easter can be measured using NOAA's Regional Snowfall Index (See the section Severe *Winter Storms and Ice*).

Location

North Smithfield's relative proximity to the Atlantic Ocean renders it particularly susceptible to Nor'easters and the resulting damages and loss of human life and property.

Extent (Event Magnitude)

On average, North Smithfield experiences or is threatened by a Nor'easter every year or two.

Impact and Damage Extent

Most damage in North Smithfield would be to trees, utilities, roads, stormwater infrastructure, personal property, and snow loads on roofs. Debris in streams and streets would impair drainage and result in more flooding. The Blizzard of 1978 was the largest Nor'easter on record. Many people in Rhode Island were without heat and electricity for over a week.

History

Table 6 Nor'easter History in Providence County[15]

Date	Comments
02/10/1969	Up to 20 inches of snow in parts of Rhode Island.
02/06/1978	Catastrophic snowstorm in Southern New England. 3' of snow reported in nearby Providence.
02/11/1994	Major Nor'easter in the region. School closed by noon, business and highway travel disrupted.
02/18/1998	Heavy rain and strong winds.
02/23/1998	Second Nor'easter to affect region in less than one week brought heavy rainfall and strong winds. 2" of rain fell over the eastern and northern part of the state. Wind gusts in North Smithfield were 47 mph.
03/21/1998	Spring nor'easter brought a mixture of snow, sleet, and rain to Rhode Island. Over the northern half of the state, snow accumulation was from 2 to 4.5 inches.
02/17/2003	A powerful nor'easter, often referred to as the Presidents' Day Storm, impacted the northeastern United States, including Rhode Island. This storm brought heavy snowfall, with some areas in Rhode Island receiving over 20 inches of snow. Strong winds contributed to drifting snow and power outages. 20 inches of snow was reported in nearby Woonsocket.
10/25/2005	Strong nor'easter brought high winds and rainfall of 2 to 2.5 inches. Strong winds took down trees and utility wires, resulting in scattered power outages.
04//14/2007	A late-season nor'easter brought strong winds and heavy rainfall to the areas. Minor to moderate flooding of the Blackstone and Pawtuxet Rivers. The worst of the storm was felt in the southeastern part of the state.
01/12/2011	Ten to twenty-two inches of snow fell in northwest Providence County from a winter nor'easter. Treacherous road travel in the region.
03/2018	A powerful nor'easter struck the eastern United States, affecting Rhode Island. This storm brought heavy snowfall, coastal flooding, and strong winds to the region. Some parts of Rhode Island received more than a foot of snow.

Probability of Future Occurrence

Highly Likely.

Climate Change Impacts

Similar to hurricanes, changes in air and water temperatures may lead to stronger Nor'easters along the Atlantic Ocean. North Smithfield should expect stronger and more frequent severe storms.

15 NOAA Storm Event Database, Providence County. https://www.ncdc.noaa.gov/stormevents/, and 2024 State of Rhode Island Hazard Mitigation Plan.

Hurricanes

Description

Tropical and extratropical storms are two distinct types of weather systems characterized by their formation, structure, and associated meteorological conditions.

Tropical storms originate over warm ocean waters, typically in tropical and subtropical regions. They form when warm, moist air rises, creating an area of low pressure at the surface. Warm ocean waters provide the heat and moisture necessary for their development. Tropical storms have a well-defined center called the "eye" surrounded by bands of thunderstorms. They have warm core temperatures, meaning that the strongest winds and heaviest rainfall are concentrated near the center. Their primary energy source is the heat released when moist air rises and condenses into clouds. Tropical storms are often driven by easterly trade winds and move generally west and north.

However, their paths can be influenced by various atmospheric factors.[16]

There are three categories of tropical storms:

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

Hurricanes are categorized according to the Saffir/Simpson scale (**Table 7**) with ratings determined by wind speed and central barometric pressure. Hurricane categories range from 1 through 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.

The Saffir-Simpson scale 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 7 Saffir/Simpson Hurricane Wind Scale[17]

Wind Speed	Typical Effects
Category 1 – Weak 74-95 mph	*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.
Category 2 – Moderate 96-110 mph	*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.
Category 3– Strong 111-129 mph	*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

16 2024 State of Rhode Island Hazard Mitigation Plan.
17 National Weather Service, National Hurricane Center

	buildings. Mobile homes are destroyed. There is a minor amount of failure of curtain walls (in framed buildings).
Category 4 – Very Strong 130-156 mph	*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.
Category 5 – Devastating 157 mph or greater	*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.

Location

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

Extent (Event Magnitude)

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 and Damage Extent

Hurricane strength storms can cause flooding. Extensive rain could damage homes, roads, and cripple the town. The high winds could down power lines and trees, and damage older structures. During extremely dangerous conditions, the Town may elect to open shelters. Damage extent is dependent upon the size and timing of the storm. A slow-moving storm may bring more rain to the area than a fast-moving storm.

History

Since 1851 North Smithfield has experienced impacts from 62 hurricanes of varying magnitude.[18] The following summarize some of the more impactful storms of memory.

Hurricane Carol (1954) was the most destructive storm to hit New England since the Great New England Hurricane of 1938. This powerful storm was very destructive to the Rhode Island coast. North Smithfield was impacted by strong winds and up to 5 inches of rain.[19]

On September 28, 1985, Hurricane Gloria reached New England as a category one storm. Approximately 300,000 people were without power throughout the state. The governor declared a state of emergency, closing all schools and roads. North Smithfield experienced high winds and heavy rain.

18 NOAA Historical Hurricane Tracks (accessed January 2023) https://bit.ly/3XeAesS
19 NOAA Remember Hurricane Carol. https://storymaps.arcgis.com/stories/627b888d92cb45349eaa55179b09ea07

Hurricane Bob made landfall in Newport, RI on August 19, 1991 as a Category 2 hurricane with winds over 100 mph. Bob brought heavy rain and destructive winds to North Smithfield.

Fallen tree from Hurricane Bob, August 1991.

On Sunday August 28, 2011, Tropical Storm Irene hit North Smithfield, with heavy rain and wind gusts of up to 80 mph, resulting in fallen tree limbs, downed power lines, uprooted trees, failed transformers and property damage.

Hurricane Sandy, in October 2012 left North Smithfield with approximately 3,500 homes without power, several downed trees, and a blown transformer. The threat of long-term power outages and broad impacts of the storm were concerns of the Town. Therefore, in anticipation of possible flooding and power outages, the Town provided citizens access to 1,000 sandbags and Scouter's Hall was designated a "comfort area", providing charging stations for cell phones and other electronic devices. Residents received power again in a day and a half. During the storm, the Main Regional Shelter in Cumberland High School was ready to receive any North Smithfield residents in need of aid. The Town was well prepared for the storm and there were no lasting significant impacts.

On August 4, 2020, Tropical Storm Isaias moved into Rhode Island. The most significant damage was reports of trees down.

Tropical Storm Henri made landfall in Rhode Island on August 22, 2021. North Smithfield experienced downed trees and power lines. Wind gusts of 45 mph were reported.

Probability of Future Occurrence

Likely.

Climate Change Impacts

Warming global air and water temperatures may increase the intensity of hurricanes that travel along the Atlantic Coast.

Severe Winter Storms and Ice

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 and ice do occur and can be more than an inconvenience and cause extensive damage. The two major threats from these hazards are loss of power due to ice on electrical lines 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. An ice storm occurs when moisture falls and freezes immediately upon impact.

Location

A severe winter storm could have a serious impact on private and public structures, schools with flat roofs, as well as the general population throughout North Smithfield.

Extent (Event Magnitude)

On average, North Smithfield receives 37 inches of snow during the winter months. The average winter temperature (December-February) in North Smithfield is 39 degrees Fahrenheit.[20]

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

20 U.S. Climate Data https://www.usclimatedata.com/

Figure 4 SPIA Index

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	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	
2	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	
3	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	
4	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	
5	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 and Damage Extent

The combination of wind, ice, and snow can have a crippling effect on the town. Heavy and/or excessive snowfall amounts can stress roofs and slow plowing efforts, as well as cause power outages. The local economy slows when businesses are closed due to winter weather. Heavy snow and ice can take down trees, knock out power, block roads, and cause structure damage. Falling trees have taken out power lines, damaged buildings, and essentially shut down the town. Flash freezes and icy roads from rain or high tides can also cause dangerous driving conditions.

History

North Smithfield has been subjected to annual snowstorms and Nor'easters. The Great Blizzard of 1978 blanketed Providence County with 40 inches of snow and closed businesses for several days. More than 9,000 people in Rhode Island sought refuge in makeshift shelters, hotels, and movie theaters.

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.

In February 2013, Winter Storm Nemo temporarily crippled the region. Power lines were downed, and heavy snow hampered driving conditions.

Table 8 History of Recent Significant Snow Events in Providence County[21]

Date	Inches	Comments
02/08/2015	7-13	A clipper low moved across southern Quebec on February 7. This was followed by low pressure moving east from the Great Lakes on February 8. On February 9 and 10, low pressure moved off the mid-Atlantic coast, becoming a Nor'easter as it approached southern New England. This all resulted in a long duration snowstorm that dumped up to a foot and a half of snow across southern New England.
02/14/2015	7-12	Heavy snow to all of southern New England.
01/23/2016	4-8	Low pressure intensified as it moved off the coast of North Carolina and tracked northeastward, passing south of southern New England. This brought accumulating snow to areas south of Interstate 90 in Massachusetts, including Connecticut and Rhode Island. In addition, strong, damaging winds accompanied the snow. With bare trees, there was remarkably little damage associated with winds that gusted near hurricane force at times.
02/5/2016	6-8	Extraordinarily wet and heavy snow, bringing down trees and wires across portions of southern New England.
02/8/2016	4-8	Heavy snow and gusty winds.
04/4/2016	5-8	Early April snow across much of southern New England.
03/14/2017	5-6	Mix of snow, sleet and rain. Strong/damaging winds gusted to 45 to 60 mph
11/15/2018	4-7	Moderate to heavy snow.
01/07/2022	8-12	Widespread snow, especially in northern Rhode Island.
01/29/2022	15-18	Blizzard conditions across the state.
02/27/2023	5-7	Heavy snow.
01/06/2024	7-11	Heavy snow later mixed with rain.

Probability of Future Occurrence

Highly Likely.

Climate Change Impacts

North Smithfield may likely see less snowfall over the winter season but may see more intense blizzards when they do occur. If there is enough moisture in the atmosphere, it may fall as freezing rain, coating everything in ice. North Smithfield should expect more ice events.

21 Snow events impact the entire region but vary across the state. The NOAA history of events in Providence County is the most comprehensive resource. NOAA Storm Event Database www.ncdc.noaa.gov

Flooding (Heavy Rain, Runoff, Flash, Inland Flooding)

Description

North Smithfield experiences many types of flooding, none of which are independent from one another. The North Smithfield HMC has decided to treat all types of flooding as a singular hazard. See descriptions below.

According to the 2024 State of Rhode Island Hazard Mitigation Plan, flooding "is 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. Flooding is often caused by heavy rainfall, snowmelt, storm surges, or the failure of natural or artificial barriers. Flooding can lead to the inundation of homes, roads, farmland, and other areas, causing damage to property, disruption of daily life, and potential threats to human safety and the environment."

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.

Flooding due to **runoff** (sometimes called urban flooding) 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. Homeowners may submit an application to FEMA (Letter of Map Change) for a formal designation of the property relative to the flood zone. For more information see https://www.fema.gov/flood-maps/change-your-flood-zone.

"**Flash flooding** occurs during heavy or extended periods of rain, generally when the ground is unable to rapidly absorb the water. Heavy sustained rain can create rapid flooding very quickly, and flooding can occur miles away from where the rain fell. Factors that can contribute to the severity of flash flooding include rainfall intensity, duration, drainage condition, and ground conditions (paved or unpaved). Flash floods are particularly dangerous to people and property,

as six inches of moving water can knock a person down and two feet can lift a vehicle. As there is often little warning of a flash flood event, they are the cause of most flood fatalities."[22]

Riverine flooding occurs when heavy rainfall or snow melt causes the water in rivers and streams to flow over their banks. The severity of the flood depends on the saturation of the surrounding ground, the amount of precipitation, and duration of the event. Riverine flooding is most likely to occur in the late summer and early spring due to snow melt and spring rainfalls.

Table 9 North Smithfield Flood Zone Descriptions

Flood Zone	Description
AE	1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Base Flood Elevation is provided.
AO	1% or greater chance of shallow riverine flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage
X (shaded)	Areas subject to inundation by the 0.2% annual-chance flood event.

Location

Low-lying areas around the streams and rivers are the most vulnerable to flooding.

During heavy or extensive rain events, flooding around town is generally caused by undersized catchbasins and poor natural drainage. These areas include but are not limited to:

- Cherry Brook
- Branch River
- Iron Mine Hill Road
- Pound Hill Road
- Old Smithfield Road
- School Street
- Greene Street
- Providence Street (Route 104)
- Route 146

According to the July 2023 Flood Insurance Study for Providence County, principal sources of riverine flooding in North Smithfield include the Blackstone River, Cherry Brook, and Crookfall Brook.

Extent (Event Magnitude)

The flood event which occurred in March 2010 was a 250 year +/- event with about 8 inches of rain in a short period of time. Significant flooding along the Cherry Brook and the Branch River only compounded the extent of flooding. FEMA paid out more than $360,000 in damage claims. The more frequent flooding occurs during heavy rain events when the stormwater infrastructure cannot drain the roads fast enough and water backs up.

22 2024 State of Rhode Island Hazard Mitigation Plan.

Impact and Damage Extent

Damages can be localized or extensive. In addition to inconveniencing populations, severe flooding can impact the wastewater infrastructure and local businesses. Flooded roads can also increase the risk of car accidents.

Bridges along the flooded rivers can be compromised as waters rise and scour away at the foundations.

The flooding that occurred in March 2010 was the most memorable. Roads were closed, stormwater flooded the wastewater treatment plant and basements were being flooded.

History

The most significant riverine flood in North Smithfield was in March 2010 when major rivers throughout the state crested their banks.

Most of the damage in Providence County was from rainfall, water runoff, and wind damage. On April 2, 2010, the FEMA major disaster declaration for the State of Rhode Island was amended to include Providence County.

The larger events in the county are outlined in the following table.

Table 10 Recent History of Flooding in/near North Smithfield [23]

Date	Comments
3/28/2010	Heavy rains, Cherry Brook and Branch River rose above flood levels. Numerous streets and basements were flooded across the region with several being undermined and eroding away. The entire state was impacted by this event and a Presidential Disaster Declaration was made. It is estimated that there were over $26 million in damages.
06/07/2013	Remnants of Tropical Storm Andrea. Significant river and small stream flooding.
09/05/2022	Heavy rain and significant flash flooding. Reported 7.95 inches of rain fell in neighboring Smithfield.
09/11/2023	Widespread flash flooding in the area. Many streets closed due to flooding. Breakneck Hill Road in nearby Lincoln was flooded.

Probability of Future Occurrence

Flooding is highly likely, expected multiple times a year.

Climate Change Impacts

Changing climate conditions are likely to bring more rainfall events to North Smithfield and fewer snowstorms. More intense storms will stress the rivers and natural floodplains designed to carry floodwaters.

23 NOAA Storm Even Database www.ncdc.noaa.gov/stormevents

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[24] is a 13-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 (1 kilometer/hour) are considered calm. A higher classification of 10 with wind speeds reaching 63 miles an hour (101 kilometers/hour) will blow down trees and cause considerable damage.

Table 11 Beaufort Scale

Beaufort Number	Description	Wind Speed (km/h)	Observations
0	Calm	<1	Smoke rises vertically
1	Light Air	1-5	Smoke drifts slowly
2	Light Breeze	6-11	Leaves rustle, wind vanes move
3	Gentle Breeze	12-19	Leaves and twigs on trees move
4	Moderate Breeze	20-29	Dust picked up from ground
5	Fresh Breeze	30-38	Small trees sway in the wind
6	Strong Breeze	39-51	Large branches move
7	Near Gale	51-61	Trees move, hard to walk
8	Gale	75-86	Twigs break off trees
9	Strong Gale	75-86	Branches break off trees
10	Whole Gale	87-101	Trees uprooted
11	Storm	102-120	Buildings damaged
12	Hurricane	>120	Severe building and tree damage

Location

Wind events are expected throughout North Smithfield.

Extent (Event Magnitude)

24 Source: NOAA Storm Prediction Center. Developed in 1805 by Sir Francis Beaufort.

The windier part of the year lasts for 5.9 months, from October 31 to April 28, with average wind speeds of more than 5.5 miles per hour.[25]

Impact and Damage Extent

Damages from wind events range from power outages, property damage to vehicles and buildings and fallen trees/limbs. Previous wind events in North Smithfield have resulted primarily in power outages and downed tree limbs with minimal property damage. It is important that the Town of North Smithfield maintain their public tree trimming program that will reduce the likelihood of fallen trees/limbs from disrupting transportation routes, taking down power lines, and/or creating damage to the tree canopy.

History[26]

Table 12 Recent History of High Winds in Providence County

Date	Magnitude (mph)	Comments
04/29/2010	40-50	Downed wires and property damage.
12/08/2011	63	Heavy rain and damaging winds.
10/29/2012	50-60	Superstorm Sandy.
01/20/2013	60-70	Trees down in neighboring Woonsocket.
08/02/2017	50-60	Trees down at Providence Pike/Industrial Drive
10/29/2017	63	Power outages from downed trees.
10/15/2018	53	Trees and wires down the areas.
10/16/2019	52	Heavy rain and strong damaging winds.
05/09/2020	48	Trees and wires down on Douglas Pike in neighboring Smithfield.
10/07/2020	49	Hundreds of thousands of people were left without power in southern New England, as there was widespread tree and power line damage from winds generally gusting to between 50 and 80 mph. The Storm Prediction Center officially classified it as a derecho.
10/10/2020	43	A tree and wires were down on Old Greenville Road between Hanton Road and Deerfield Drive in North Smithfield.
03/29/2021	49	Tree down on Burlingame Road in neighboring Smithfield.
10/27/2021	55	Nor'easter. More than one-half million power outages were reported in MA and RI.
11/12/2021	55	Damaging wind gusts and heavy rain.
11/30/2022	49	Scattered tree damage.
12/23/2022	49	Damaging winds in northern Rhode Island.
02/03/2023	49	Arctic cold front brought strong damaging winds in addition to below zero temperatures.

Probability of Future Occurrence

Highly Likely.

Climate Change Impacts

Changes in atmospheric circulation are predicted to occur. See "Nor'easters" and "Hurricanes."

25 WeatherSpark https://weatherspark.com/y/26163/Average-Weather-in-North-Smithfield-Rhode-Island-United-States-Year-Round
26 NOAA Storm Event Database (2024)

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.[27]

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 was five degrees below zero, 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[28].

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 nighttime 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.

The heat index is what the temperature feels like to the human body feels when relative humidity is combined with air temperature.

Location

An extreme heat or cold event would be a regional issue affecting North Smithfield and significant portions of Southern New England.

Extent (Event Magnitude)

The extent of extreme cold is measured by the Wind Chill Temperature Index, and extreme heat is generally measured through the Heat Index. Both indices provide a measure of how temperatures feel.

Impact and Damage Extent

Extreme temperatures could have a serious impact on private and public structures, as well as the general population throughout North Smithfield. During a heat wave, water supplies for drinking and firefighting may be stressed. There is added stress to the power grid and the natural environments.

27 2024 State of Rhode Island Hazard Mitigation Plan.
28 ibid.

The age of a structure could impact its resilience to extreme temperatures. Older buildings may have been constructed using materials and design techniques that are not as resilient as modern standards.

Personal exposure to dangerous heat conditions may lead to heat cramps, heat exhaustion, and heat stroke. These are especially important to monitor in children, elderly, and vulnerable populations that are not able to move to cooler conditions.

Extreme cold conditions may occur during, after, or without any connection to a winter storm. During extended periods of extreme cold temperatures, there is a greater likelihood for frozen water pipes and services, higher fuel usage, and icy roads. Exposure to extreme cold can lead to hypothermia and frostbite.

History[29]

NOAA's Storm Events Database does not have any records specifically for North Smithfield but reports at nearby North Central Airport (about 2 miles southeast) in Smithfield are usually available.

Table 13 Extreme Temperatures (Excessive Heat, and Extreme Cold/Wind Chill) at North Central Airport[30]

Date	Temperature	Comments
07/22/2011	105	Heat index values rose above 105 for a period of a few hours at North Central State Airport new Smithfield.
02/16/2015	-30	Wind chills as low as 30 degrees below zero for a six-hour period.
02/14/2016	-32	Wind chills as low as 32 degrees below zero.

29 NOAA Storm Event Database (2024)

30 NOAA Storm Event Database (2024)

Probability of Future Occurrence

Highly likely.

Climate Change Impacts

"Temperatures in Rhode Island have risen by 4° F since the early 1900s, with the number of hot days above the long-term average since the 1990s. Additionally, the greatest number of warm nights has been recorded over the 2015–2020 period. Very cold days have been mostly below average since the 1980s."[31]

According to the 2024 State of Rhode Island Hazard Mitigation Plan, "Continued warming is projected throughout this century. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme temperature events. Additionally, rising temperatures can harm air quality and amplify existing threats to health. Warmer weather can increase the production of ground-level ozone, a pollutant that causes lung and heart problems. Heat stress is expected to increase with hotter summer temperatures and more humidity. Children, the elderly, the sick, and those living below the poverty line may be especially vulnerable."

Brushfire

Description

Brushfires 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 wildfires to spread, most wildfires are caused by people through criminal or accidental misuse of fire.

Brushfire at St. Paul's Street, April 2009.

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 country; however, smaller 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.

31 2024 State of Rhode Island Hazard Mitigation Plan

Climatic and meteorological conditions that influence wildfires include solar insulation, 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 brushfires. 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 brushfires 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.

The temperate climate in North Smithfield is not conducive to endure long periods of drought that lead to widespread vegetation loss. Destructive lightning fires in remote locations are rare but there is always a risk of fires from arson or careless fire use.

Location

The open fields, forested areas, and grassy areas throughout the town are most at risk. The Wildland Urban Interface (WUI)- the area where the built environment meets with the undeveloped wildlands is also vulnerable to fast spreading brushfires. In North Smithfield, these areas include woodland portions of the Town, particularly, in Slatersville, Great Road, Victory Highway, Providence Pike, and along Route 146.

Extent (Event Magnitude)

Brushfires average about two to three per year with a burn area of generally 2-10 acres per fire. The extent has decreased over the years due to better response equipment, faster response time, and the widespread use of cell phones used to report fires. However, the wildland-urban interface is growing, potentially putting more infrastructure and lives at risk.

Impact and Damage Extent

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

The likelihood of brushfires occurring and having widespread impacts has decreased over the years as fields and wooded areas are taken over by development.

History

In April 2023 during a period of dry conditions and high wind, a small brushfire spread to a home on Providence Pike.

In April 2009 a brushfire on St. Paul Street, threatened two structures.

Probability of Future Occurrence

Highly likely.

Climate Change Impacts

Longer dry periods and droughts may increase the probability of brushfires but their extent has diminished over the years due to advances in detecting and firefighting technologies.

Lightning/Thunderstorms/Hail

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 localized 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 over the course of a few hours. Thunderstorms usually bring heavy rains (which can cause localized 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 are injured by lightning every year.[32] Lightning often strikes as far as 10 miles away from any rainfall.

Hail is formed in towering cumulonimbus clouds (thunderheads) and falls as precipitation in the form of irregular balls of ice more than 5mm in diameter.

Table 14 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

32 NOAA Lightning Safety https://www.noaa.gov/jetstream/lightning/lightning-safety.

Table 14 Hail Size

Hail Diameter	Size Description
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 North Smithfield is susceptible to lightning/thunderstorms and hail.

Extent (Event Magnitude)

The NWS classifies a thunderstorm as severe if it produces hail at least one (1) inch in diameter, winds of 58 mph or greater, or a tornado. 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.

The town does not experience regular lightning strikes. On average, the fire department responds to one per year.

Impact and Damage Extent

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, residences, and critical facilities.

The National Grid substation and the sewer and water infrastructure are susceptible to the effects of this type of event. Lightning strikes can lead to property damage because of the risk of fire. Damage to these lines has the potential to cause power and communication outages for businesses, residencies, and critical facilities.

Strong thunderstorms with high winds can also scatter debris and break tree limbs causing damage and injury, or disruption to traffic and the electrical grid.

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.

Structural vulnerability to hail varies. 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. Glass windows and exposed vehicles are also susceptible to hail damage. Vegetation and crops are extremely susceptible to hailstorm damage.

History

There has been no reported loss of human life in North Smithfield in the past 50 years due to lightning or hail. Table 15 summarizes documented lightning strikes and hail in and near North Smithfield.

Table 15 Lightning and Hail Events in and near North Smithfield[33]

Date	Comments
06/30/2001	Quarter sized hail reported in neighboring Woonsocket.
07/19/2005	Lightning strikes in neighboring Smithfield.
05/21/2006	Penny to nickel sized hail in neighboring Smithfield.
06/20/2006	Penny sized hail and severe thunderstorms. In neighboring Smithfield, lightning struck a house and ignited a fire in the attic.
06/28/2007	Thunderstorm produced nickel to quarter sized hail in the area.
08/04/2015	House on Randall Road in neighboring Smithfield was struck by lightning, starting a small fire in the basement.

Probability of Future Occurrence

Highly Likely.

Climate Change Impacts

Changing weather patterns may lead to more severe thunder and lightning storms which produce hail.

33 NOAA Storm Event Database (2023).

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.

Hoppin Hill Reservoir in nearby North Attleboro, MA, August 2, 2022. AP Photo/Charles Krupa.

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) uses 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. Maps are created based on climate data, hydrologic and soil conditions, as well as reported impacts and observations from over 350 contributors nationwide.

Table 16 Drought Severity [34]

Severity	Category	PDSI Index Value	Drought Level	Possible Impacts
Exceptional Drought	D4	-5 or less	Emergency	Widespread crop/pasture losses, shortages of water creating water emergencies.
Extreme Drought	D3	-4 to -4.9	Warning	Major crop/pasture losses, widespread water shortages or restrictions.
Severe Drought	D2	-3 to -3.9	Watch	Crop or pasture losses likely, water shortages common, water restrictions imposed.
Moderate Drought	D1	-2 to -2.9	Advisory	Some damage to crops/pastures, developing water shortages, voluntary water-use restrictions requested.
Mild Drought/ Abnormally Dry	D0	-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 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 throughout the state. Although temporary drought conditions may occasionally exist in Rhode Island, affecting North Smithfield, devastating long term drought conditions are not indicative of this temperate region.

Extent (Event Magnitude)

According to The National Weather Service Rhode Island receives on average 39" to 54" of rain annually. Notwithstanding the same, the State experiences extended periods of dry weather. New England frequently experiences short "flash droughts" which are the rapid onset of intense dry periods that follow normal to above normal rainfall. Some type of drought in Rhode Island occurs approximately once every few years.

34 Drought Monitor http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx

Impact and Damage Extent

The main impacts of meteorological drought are periods of very high fire danger and low drinking water supplies. North Smithfield's drinking water is supplied by the Slatersville Public Water Supply which draws from various wells. Changes in water levels can impact not only the quantity of available water but also the quality.

Of particular concern, socially vulnerable and at-risk populations that may have difficulty with medical issues, poverty, extremes in age, and communications due to language barriers are often at increased susceptibility to the impacts of hazards such as drought.

Drought conditions in Rhode Island primarily impact agriculture, reducing crop yields, and promote insect infestations, plant disease, and wind erosion. 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.

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 (USGS: Rhode Island Floods and Droughts). Very few drought events have occurred in Providence County. The most recent event in 2012 occurred without the need for any drought declaration due to the above normal precipitation which followed.

Table 17 History of Droughts in Rhode Island[35]

Date	Area Affected	Category	Remarks
1930-31	Statewide	D1/D2	Stream flow of 70% normal.
1941-45	Statewide	D1	Stream flow of 70% normal in Blackstone and Pawtuxet Rivers.
1949-50	Statewide	D1/D2	Stream flow of 70% normal.
1963-67	Statewide	D1-D3	Water restrictions/well replacements common.
1980-81	Statewide	D1	Groundwater deficient in eastern part of state. Considerable crop damage.
1987-88	Southern part of the state	D0/D1	$25 million crop damage.
1998-99	Statewide	D1-D3	Spring through summer the State experienced 75% of normal flow.
2012	Statewide	D2	January –April 2012. Meteorological drought due to precipitation levels one half of normal.
2016	Statewide	D2	August to November. Severe Drought due to below normal precipitation.
2020	Statewide	D3	September to November. Extreme Drought
2022	Statewide	D3	July to September. Extreme Drought
2023	Statewide	D1	April to May. Moderate Drought

Probability of Future Occurrence

Likely.

Climate Change Impacts

Even though rain events may intensify due to climate change, the periods between them may be longer. Rhode Island expects longer periods of drought. According to the 2024 State of Rhode Island Hazard Mitigation Plan, "Current modelling from the NOAA State Climate Summary 2022 for Rhode Island suggests that annual average precipitation, as well as extreme precipitation events, are projected to increase for Rhode Island. Although increased precipitation is projected, naturally occurring droughts are projected to be more intense because higher temperatures will increase evaporation rates.

Additionally, higher temperatures associated with climate change can increase the rate of evaporation from soil, water bodies, and vegetation. This can contribute to soil moisture depletion and more rapid drying of surface water sources during dry periods."

35 U.S. Drought Monitor https://droughtmonitor.unl.edu/DmData/DataTables.aspx

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 2023, there are 95 high hazard dams, 81 significant hazard dams and 494 low hazard dams in the state.[36] Each dam's hazard classification determines the frequency of inspection. The higher the classification, the more frequently the inspection is conducted.

As part of each Rhode Island Department of Emergency 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 stress the structural integrity of dams that would affect North Smithfield. In 2023 the Department of Environmental Management (DEM) identified twenty-one dams in the Town of North Smithfield. Four are classified as high hazard dams; two are classified as significant hazard dams; the remainder are considered low hazard. See **Table 18**.

Location

Table 18 Dams in North Smithfield

Dam #	Name	River	Hazard Class	Ownership[37]
393	Blackstone	Blackstone River	Low	
045	Slatersville Upper Intermediate	Branch River	Low	Unknown
044	Slatersville Upper Trench Return # 1	Branch River	Low	Unknown
043	Slatersville Reservoir Upper Dam	Branch River	High	Dudley Development Corporation
046	Slatersville Reservoir Middle Dam	Branch River	High	Dudley Development Corporation
047	Slatersville Reservoir Lower Dam	Branch River	Significant	Slatersville Hydro, LLC
068	Woonsocket Reservoir #3	Crookfall Brook	High	City of Woonsocket
048	Forestdale Pond Dam	Branch River	High	Sedona Associates, LLC
053	O'Hara Pond Dam	Trout Brook	Low	Unknown
491	Winsor Farm Pond	Rankin Brook	Low	Unknown
055	Pratt Pond Dam	Dawley Brook	Low	Unknown
067	Todd's Pond Dam	Cherry Brook	Significant	Private
107	Primrose Pond Lower Dam	Woonasquatucket River	Low	Unknown
417	Mingola Pond Dam	Woonasquatucket River	Low	Unknown

36 2023 Annual Report to the Governor on the Activities of the Dam Safety Program. https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/damrpt21.pdf

37 RIDEM Environmental Map Viewer

418	Cesario Pond Dam	Woonasquatucket River	Low	Unknown
460	Gardner Farm Pond Dam	Woonasquatucket River	Low	Unknown
416	Fly & Fish Club	Trout Brook	Low	Unknown
539	Fort Farm Pond Dam # 1	Trout Brook	Low	Unknown
599	Chester St Pond	Unnamed Stream	Low	Unknown
631	Bourget Court Pond	Trout Brook	Low	Unknown
632	Karen Marie Drive Pond	Rankin Brook	Low	Unknown

Extent (Event Magnitude)

All three dam hazard classifications are represented in North Smithfield. The extent of a failure would vary. The North Smithfield Hazard Mitigation Committee has identified failure as a break in the dam, sending water downstream. The HMC is also concerned about dam failures further upstream in other municipalities that could impact their town.

Impact and Damage Extent

The North Smithfield Hazard Mitigation 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 North Smithfield. Severe winter storms, flooding, and a hurricane could all bring enough rain and or snowfall to cause a dam failure in North Smithfield. The age of these dams also poses a risk to the structural integrity of these dams. A failure of the earth or masonry construction materials could cause loss of lives, property, the natural environment, and economy.

History

There has been no history of dam failure in North Smithfield.

Probability of Future Occurrence

Likely.

Climate Change Impacts

Related to flooding, more intense rain events may stress the structural integrity of dams which would lead to failure.

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). **Table 19** shows 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 Fujita Scale, carved its way through Cranston, RI, and Providence, RI, causing twenty injuries and $2,500,000 in damages. **Table 20** highlights more tornado events that have affected Rhode Island.

Table 19 Fujita Scale

Fujita Scale			Enhanced Fujita Scale		
F Number	Fastest ¼ mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	Damage Scale
0	40-72	45-78	0	65-85	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	73-112	79-117	1	86-110	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
2	113-157	118-161	2	111-135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	158-207	162-209	3	136-165	Severe damage. 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	208-260	210-261	4	166-200	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars were thrown and large missiles generated.
5	261-318	262-317	5	Over 200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Location

All of North Smithfield is susceptible to tornadoes. Providence County has experienced more tornadoes than any other Rhode Island county.[38]

Extent (Event Magnitude)

Historically, North Smithfield isn't known to be a hotbed of tornado activity. In 2018 an EF-1 tornado touched down in nearby Lincoln suddenly requiring the region to reconsider their risk. It is expected that future tornadoes will be 0 or 1 on the F-Scale of magnitude.

Impact and Damage Extent

Tornadoes can cause significant damage to buildings, trees and above ground utility lines. Flying debris can cause injuries to residents.

History

Table 20 Recent Tornado Events in Rhode Island[39]

Date	EF-Scale	Injuries	Damage	Location
8/16/2000	0	0	$0	Providence County
8/7/2004	0	0	$0	Kent County
7/23/2008	1	0	$47,987	Bristol County
8/10/2012	0	0	$50,000	Washington County
10/23/2018	1	0	$1,000,000	North Providence and Lincoln
10/02/2019	0	0	$5,000	Portsmouth
11/13/2021	1	9	$50,000	Foster, Westerly, and CT
08/18/2023	1/2	1	$250,000	Scituate, Johnston, North Providence
09/13/2023	1	0	$35,000	Glocester and Lincoln

Probability of Future Occurrence

Likely. This is a change in risk perception from the 2019 Hazard Mitigation Plan which did not discuss tornadoes as a separate hazard.

Climate Change Impacts

It is uncertain how climate change will affect tornado outbreaks in North Smithfield. Climate change can influence temperature, humidity, wind patterns, and atmospheric instability which may affect tornado activity.

38 2024 State of Rhode Island Hazard Mitigation Plan
39 NOAA Storm Event Database (2023)

Earthquake

Description

An earthquake 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 can cause serious damage over large areas.

Although earthquakes are not considered to be a major problem in the Northeast United States, they are more prevalent than one might expect. **Table 22** 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 logarithmic scale and are commonly scaled from 1 to 8. The higher the magnitude on the Richter Scale, the more severe the earthquake.

The 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. See **Table 21**.

Table 21 Magnitude Scale Comparisons

Modified Mercalli Intensity	Richter Scale Magnitude	Description of Intensity Level
I	1 to 2	Not felt except by a very few under especially favorable circumstances.
II	2 to 3	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	3 to 4	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	4	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	4 to 5	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	5 to 6	Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	6	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	6 to 7	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.

Table 21 Magnitude Scale Comparisons

Modified Mercalli Intensity	Richter Scale Magnitude	Description of Intensity Level
IX	7	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	7 to 8	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	8	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	8 or greater	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.

Extent (Event Magnitude)

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

"Seismologists and geologists agree that earthquakes are impossible to predict with any degree of accuracy. Rhode Island is in an area of low risk of seismicity. Figure 5 shows earthquake epicenters near Rhode Island. Seismic risk is a function of the seismic hazard, location demographics, and regional economics to the vulnerabilities of the structure or lifeline on the site."[40]

40 2024 State of Rhode Island Hazard Mitigation Plan

Impact and Damage Extent

The committee recognizes that the potential for an earthquake to strike the Town of North Smithfield is relatively low but the hazard could afflict town-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 historic structures.

History

No major earthquakes have happened in North Smithfield but have been felt in the state. See **Figure 5** and **Table 22**.

Figure 5 Rhode Island Earthquake Epicenters (1974 -2018)

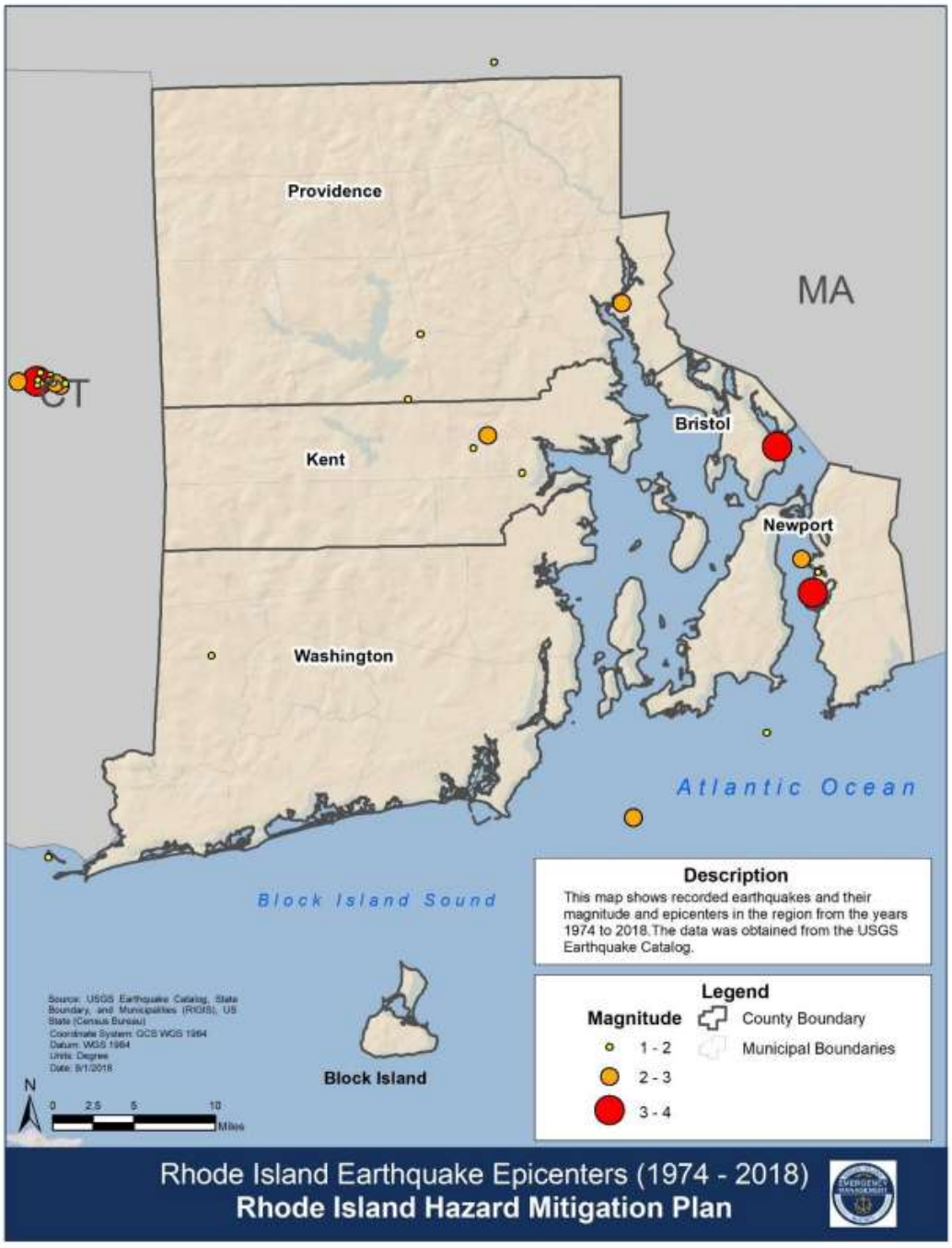


Table 22 Historic Seismic Activity in/near Rhode Island[41]

Date	Epicenter	Epicenter Magnitude	Mercalli Intensity Level
10/16/1963	Coastal MA	4.5	Caused some cracked plaster (MMI V) at Chepachet, Rhode Island.
6/14/1973	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.
04/04/2013	Hope Valley, RI	1.8	Felt locally.
01/12/2015	Wauregan, CT	3.3	Felt locally in RI
07/22/2015	East Providence, RI	2.3	Felt locally in RI, maybe felt in North Smithfield
01/02/2020	Exeter, RI		Felt locally in RI
11/08/2020	Buzzards Bay	3.6	Felt locally in RI
11/22/2020	Buzzards Bay	2.0	Felt locally in RI
06/12/2022	Bristol, RI	1.6	Felt locally in RI

Probability of Future Occurrence

Possible.

Climate Change Impacts

It is uncertain how climate change will affect earthquake magnitude in and around North Smithfield. Due to the long-term nature of these geological processes, the seismic hazard for North Smithfield, or Rhode Island, is not expected to change during the life of this plan.

Electromagnetic Pulses (EMP)

Description

According to the United States Department of Energy, electromagnetic pulses (EMPs) are "intense pulses of electromagnetic energy resulting from solar-caused effects on man-made nuclear and pulse power devices." These EMPs can be naturally occurring or human-caused

41 United States Geologic Survey http//neic.usgs.gov/neis/states/rhode_island/rhode_island_history.html and Earthquake Hazards Program "*Did You Feel It*" Archives.

hazards. Examples of natural EMP events include a coronal mass ejection, also known as a solar electromagnetic pulse, and solar storm causing a geomagnetic disturbance. An EMP can also be caused by a nuclear or non-nuclear explosion that creates high magnitude electric and magnetic fields and induced currents in the earth and electric grid.

"In 2015, Congress amended the Homeland Security Act of 2002 by passing the Critical Infrastructure Protection Act (CIPA), which protects Americans from an EMP. It is also required reporting of EMP threats, research and development, and a campaign to educate planners and emergency responders about EMP events."[42]

EMP mitigation is difficult and largely done at the national level. The federal government has focused efforts on shielding critical infrastructure from EMP effects.[43]

Location

An EMP can occur in any location and are relatively unpredictable.

Extent (Event Magnitude)

The strength of the EMP is directly related to the magnitude of the solar flare/storm or high-altitude nuclear explosion.

Impact and Damage Extent

EMPs can impact a wide range of electronic systems and devices such as communication systems on the power grid, and global-positioning systems (GPS) used for navigation. This could cause widespread destruction of property and life.

History

There have been no reports of EMPs in Rhode Island.

Probability of Future Occurrence

Possible although unlikely.

Climate Change Impacts

It is uncertain how climate change will affect solar storm magnitude in and around North Smithfield.

Climate Change

Changing climate patterns globally and in Rhode Island will worsen the effects of most natural hazards and affect future planning and mitigation efforts. Changes are already being observed and documented. Long-term climate change is likely to cause the following impacts in North Smithfield:

42 Southeastern North Carolina Regional Hazard Mitigation Plan, January 2021.

43 U.S. Department of Homeland Security, Science and Technology. *Electromagnetic Pulse Shielding Mitigations, Best Practices for Protection of Mission Critical Equipment.* August 2022.

- Heavier, more frequent precipitation events, which may cause more riverine flooding and flash flooding events.
- Longer periods of drought and heat waves which may affect water availability and increase the threat for wildfires.
- More frequent or intense high wind events such as hurricanes and Nor'easters which can damage trees, the electric grid, and property.

More frequent or severe flooding events can have widespread consequences in North Smithfield. Flooded or inaccessible property can lead to a decline in property values, increased number of foreclosures, and eventually vacant and blighted neighborhoods. These decreases in property values can lead to a reduction in local tax revenue and create budget shortfalls.

How rapidly these changes will be felt is debatable but there is certainty within the State that municipalities need to be prepared. The Town aims to become more adaptable/resilient to these changing conditions.

Through the exercise of creating this plan, the Town of North Smithfield is exploring ways to reduce their long and short-term risks to a variety of hazards. Any storm that comes up the eastern seaboard will likely impact the town. As climate conditions intensify, the HMC is prepared to update this plan accordingly

4

Risk Assessment

Facilities/Resources Inventory

The first step in the assessment process was to create the inventory of facilities and resources of special concern to the Town. The HMC identified the following as critical infrastructure/community assets:

- Flood prone areas, streets, or infrastructure, and drainage systems
- Bridges
- Wastewater facilities
- Water supply systems
- Other services/utilities
- Communication towers
- Dams
- Critical municipal hazard response facilities
- Populations
- Businesses
- Schools
- Recreational facilities
- Natural resources
- Historic resources

During the review of these assets, the HMC concluded that not all of these are so vulnerable they require a new mitigation action within the next 5 years. For some assets, the Town will continue with ongoing actions. As infrastructure ages, and climate conditions change, the HMC will update this plan accordingly.

These most vulnerable assets are identified in the Critical Infrastructure/Community Assets Matrix located at the end of this section.

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 HMC to estimate potential fiscal and population impacts for individual parcels.

The final output of this exercise is the Town of North Smithfield Community Assets Map in Appendix C. The focus of the map is not to duplicate all of the spatial information generated

through the inventorying process but rather to present the location of the identified vulnerable resources.

Fiscal Impact Analysis

Although wind and heavy snow can certainly rack up substantial damages, flooding is one of the hazards that most frequently affects area populations. The Town of North Smithfield'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 North Smithfield is comprised of 15,910 acres of land, with about 975 acres in the regulatory floodplain. These areas of flood vulnerability are located along the Blackstone River, Cherry Brook, Cedar Swamp, Rankin Brook, and Nipsachuck Swamp, and other areas in the southwestern part of town that have various small streams and ponds.

HAZUS-MH is a software tool that contains models for estimating potential losses from earthquakes, floods, and hurricanes. HAZUS-MH was used to further understand the potential risk from a large hurricane. For the purpose of this plan, a scenario was run that captures the Town's risk from hurricane damage. **Table 23** summarizes some of the potential damages. The hurricane scenario model uses the same path as the hurricane which tracked west of North Smithfield.

In 1954 Hurricane Carol (Category 1, peak gusts at 93 mph in the region) tore through Southern New England, causing extensive damage throughout Rhode Island. See **Figure 6**. If this same storm were to strike North Smithfield again today, it would cause over $25 million dollars in total economic losses (property damage and business interruption loss) in North Smithfield. About 35 buildings are expected to be at least moderately damaged.[44] See **Appendix D**.

HAZUS Qualitative Damage Description

- No Damage or Very Minor Damage
- 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.

Minor Damage

- 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.

Moderate Damage

- Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water

Severe Damage

- Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.

44 A representative analysis. No particular building is identified.

Destruction

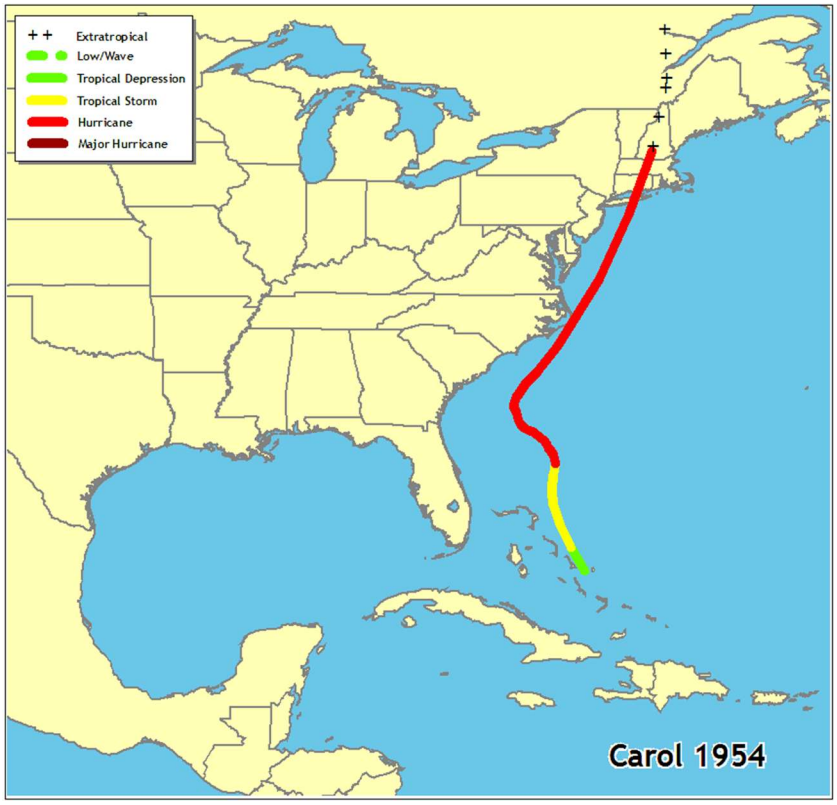
› Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.

Table 23 HAZUS-MH Scenarios for North Smithfield, RI

1954 Hurricane Carol Scenario – If It Happened Today[45]

Estimated Damage	Amount
Debris generated	14,959 tons
Buildings destroyed	0
Buildings at least moderately damaged	35 (1% of total number of buildings)
Displaced households	11 households may be displaced. 5 people out of a population of 12,588 will seek temporary shelter in public shelters.
Essential Facility Damage (fire, police, schools)	8 of 8 facilities would expect to be non-operational for less than a day.
Residential Property (capital stock)	$24,131,150
Business interruptions	$1,259,520

Figure 6 Hurricane Carol Path



45 HAZUS-MH Hurricane Global Risk Report, run May 2024.

During non-cyclone events, flooding can still impact the Town. **Tables 24** and **25** display potential damage estimates of property values of buildings 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 only. This percentage was calculated in order to assist with identifying which areas are at greater risk. According to **Table 24**, the town-wide total potential building damages for these floodplain areas are about $66 million.

Approximately 69% of North Smithfield's revenue is generated from real estate taxes.[46] 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 an 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, as North Smithfield's population grows, the burden of protecting lives and property grows.

Using data from the E-911 structure data from the RI Geographic Information System (RIGIS) and information from the North Smithfield Tax Assessor, the following table summarizes the value of the insurable buildings that are located within the Special Flood Hazard Areas.

The buildings that were located in each SFHA were first selected. There are an estimated 76 buildings in the SFHA. The Town's parcel information for each building was then used to determine the building value. Parcels in the SFHA which do not have structures were not included in this assessment.

Table 24 2024 Property Values with Structures in Special Flood Hazard Areas by Flood Zone[47]

Flood Zone	# of Parcels	Total Acres	Building Value
A	41	430	$57,739,300
AE	35	46.5	$8,757,300
Total	**76**	**476.5**	**$66,496,600**

A few notes about the data. The largest parcel with a building in the floodplain (179 acres) is the area along the Branch River owned by the Dudley Development Corporation. Note that most of that area is the Slatersville Reservoir Upper. As a whole, the Residences at Slatersville Mill are the most expensive buildings in the floodplain.

Table 25 2022 Property Values with Structures in Special Flood Hazard Areas by Zone Type

Land Use Type	# of Parcels	Building Value
Manufacturing	142	$51,356,500
Rural Agricultural	28	$5,797,900
Rural Estate Agricultural	5	$129,700
Residential- Suburban	1	$817,500
Residential- Urban	26	$5,902,900

46 Town of North Smithfield, RI Town Administrator Proposed Budget for Fiscal Year 2025.

47 Based on RIGIS e911 Sites, FEMA 2014 Flood Insurance Rate Maps, and 2024 parcel information from the Town. This data is to be used for planning purposes only to prove estimate values.

Built Environment

According to HAZUS-MH, North Smithfield has over an estimated 4,000 buildings with a total replacement value (excluding contents) of $2.9 billion. Approximately 87% of the buildings and 61% of the value are associated with residential housing.

Using the Rhode Island GIS e911 structure file, FEMA flood insurance rate maps, and the Town's GIS, it was determined that $66 million in building values (for 76 buildings) are located in the floodplain. Most of those are residential properties.

There are 17 flood insurance policies in place for a town that has about 37 structures in the regulatory floodplain (A and AE-Zones). Of the 17, there are 15 policies for structures in the lower risk X-zones. These polices are more affordable than those in the A and AE-Zones. See **Table 26**.

Table 26 Flood Insurance Information[48]

Total Number of Policies	17
Total Premiums	$17,054
Insurance in Force	$5,854,000
Total Number of Closed Paid Losses	12
$ of Closed Paid Losses	$269,727
Repetitive Loss Properties	3 residential
Severe Repetitive Loss Properties	0
Number of Policies in Each Zone:	
Zone	**Policies**
A-Zone	2
X-Zone (Standard)	15
X-Zone (Preferred)[1]	0

1 Preferred Risk Policies (PRP) are more affordable policies cover structures that were built in an X zone but due to new mapping, are now located in a Special Flood Hazard Area.

48 As per the State Hazard Mitigation Officer March 7, 2024.

Areas that didn't experience flooding previously are now more vulnerable as riverine flood intensity and frequency increases The Town has been encouraging development away from flood areas but most of this development predates recent regulations requiring flood proofing, leaving many vulnerable areas unprepared to face a storm of any significance.

The HMC has identified critical infrastructure listed in the Critical Infrastructure/Community Assets (**Table 27**). The list includes flood prone streets or infrastructure, bridges, wastewater, water supply, services/utility facilities, public communication equipment, dams, critical municipal hazard response facilities, populations, businesses, schools, recreational facilities, natural resources, and historic resources. These important community resources have the potential to be affected by natural disasters. The magnitude of the losses would be dependent upon the type, location, and extent of each unique hazard.

FEMA AE-Zone vs. A-Zone

Both are considered Special Flood Hazards Areas- areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage.

AE Zone: Base Flood Elevations (BFEs) are provided on the FEMA maps. Formerly A1-A30 numbered zones.

A Zones: Detailed studies have not been conducted which indicate depth or base flood elevation.

The Town's zoning laws help dictate future development while maintaining North Smithfield's unique 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 North Smithfield range from building codes and design standards, to zoning regulations.

Population Impact Analysis

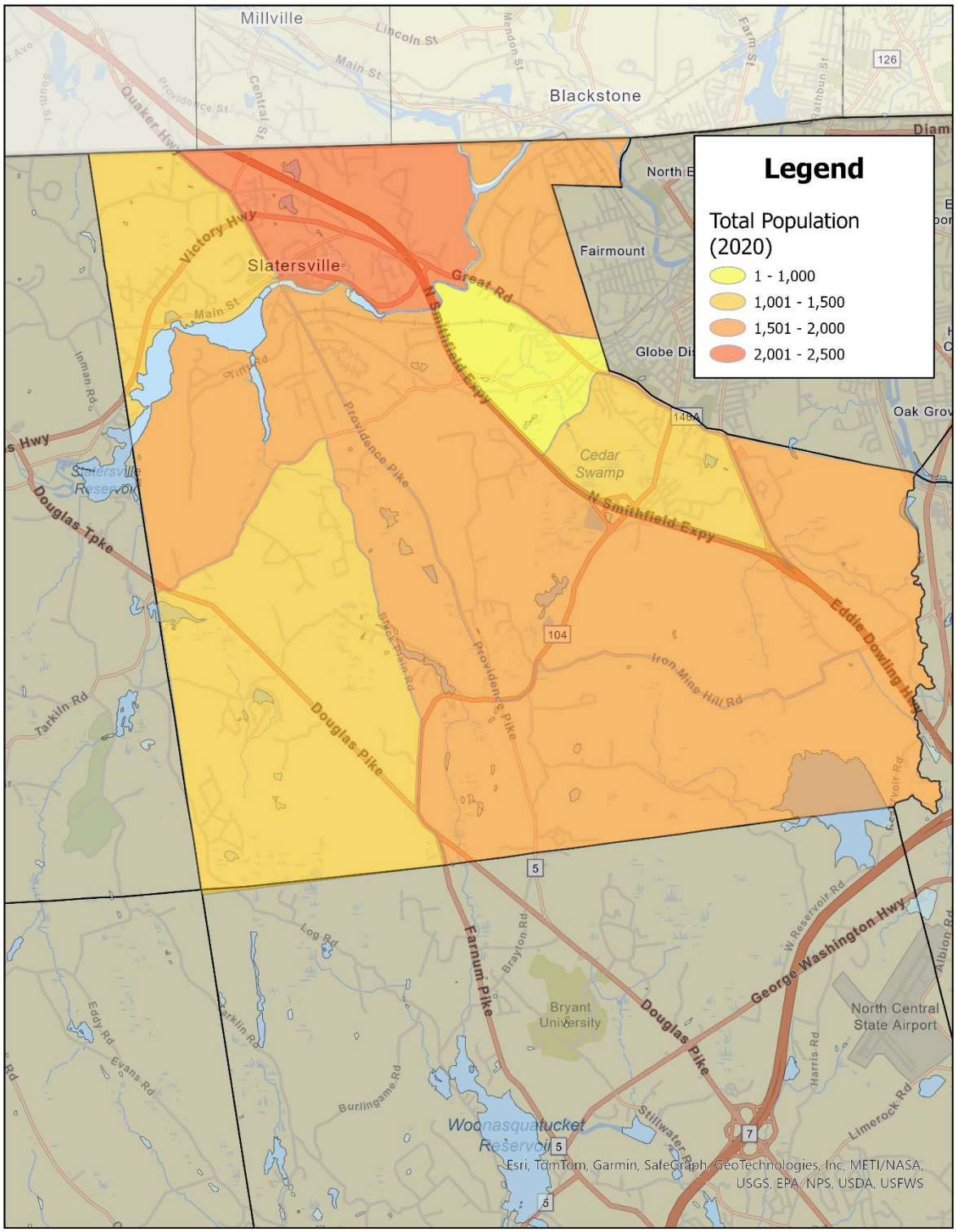
Of primary concern during a hazard event is protecting the health and safety of North Smithfield residents. In addition to knowing the total population, it's also important to estimate how many people would be impacted by loss of service or need to evacuate. According to the 2022 American Community Survey 5-Year Estimates, there are 5,297 housing units in North Smithfield supporting a population estimate of 12,535. The population in North Smithfield is generally concentrated in the Slatersville area with mixed use and multi-family buildings along with the historic single-family homes. Residents are also concentrated along Great Road, and the northeast part of Town along the Woonsocket line. **Figure 7** shows the most densely populated areas based on the best available data.

Vulnerable populations include elderly/senior citizens, special needs, disabled, business owners, veterans, and low-income residents. Non-residents may be unfamiliar with evacuation routes, sheltering options, or flood risks. They also are unlikely subscribed to the Town's Code Red system which sends out automated emergency alerts.

Improving emergency response and educating these populations is important to the Town.

A significant hazard can cripple the Town. In addition to direct damage to personal property, impacts can include the disruption of vital services, the loss of utilities, and the emotional strain from financial and physical losses. This is especially difficult when residents are forced to evacuate their homes.

Figure 7 2020 Population by Census Block



Natural Environment

The North Smithfield Comprehensive Five-Year Update (2019) identifies the following critical natural resources:

- Soils and farmland
- Mineral resources
- Groundwater reservoirs/recharge areas
- Water supply basin
- Rivers and streams
- Floodplains
- Sites listed on the RI Natural Heritage Program
- Forest resources and trees
- Scenic resources and historic landscapes

Rivers, streams and tributaries serve as important natural drainage features in North Smithfield. As more of the drainage area is developed and covered by impervious surfaces, the waterways are challenged to handle increasing flows and stormwater following heavy rain events.

Rhode Island has experienced a significant increase in both flood frequency and flood severity over the past 80 years. Climate change is expected to result in more frequent heavy rains, affecting stream flow.[49]

Hurricanes, earthquakes, Nor'easters, floods or any weather-related hazard event will have impacts on the natural environment. Differences in storm size, speed of movement, wind speeds, timing with respect to landfall location relative to vulnerable resources makes for high variability in impacts and related costs.

An estimated 50% of the land in North Smithfield has tree cover.[50] Current Subdivision and Land Development Regulations, the Erosion and Sediment Control Ordinance, and Rhode Island Intent to Cut regulations help to maintain the forested landscapes which contribute to the community's quality of life. High winds are the greatest threat to the forested areas.

When the natural environment is impacted by severe weather, there are both direct (or immediate) and indirect (or delayed) effects. Immediate impacts include loss of habitat or habitat damage. Delayed impacts may include species migration or changes in biodiversity.

49 Rhode Island's Environmental Climate Change Coordinating Council (EC4) Science and Technical Advisory Board, *Current State of Climate Science in Rhode Island,* May 1, 2016 Microsoft Word - STAB_Ann_Rpt_Final.docx (ri.gov)

50 North Smithfield Comprehensive Plan Five-Year Update 2006.

Vulnerability of Future Structures

North Smithfield is not uniformly vulnerable to natural hazards and climate change. Certain locations, resources, and populations have and will be affected to a greater degree than others. The Town's zoning districts helps to maintain these less densely developed areas. Growth should only occur when there is an available capacity for municipal services to absorb the growth, and there is a fiscal ability and community agreement to the expanded infrastructure required for growth.

North Smithfield's vulnerability to natural hazards is not expected to change dramatically over the next five years due to increased development or shifts in populations. The lack of public water and sewer certainly reduces development pressures. Enforcement of current building codes will ensure that new development will be stronger and more resilient than some of the older, historic structures in North Smithfield.

Future Vulnerability

As climate conditions change, increased storm intensity or frequency may put considerable stress on the infrastructure in North Smithfield. Roads will flood more often and may eventually become unusable. Drainage infrastructure may be overwhelmed more often. Fire hydrants, pump stations, and sewer and water lines will be stressed or inaccessible by the rising streams and rivers. Areas that are not used to flooding may see flood waters inch closer to their property.

Community Infrastructure/Community Assets Matrix

The Critical Infrastructure/Community Assets Matrix (Table 27) represents the culmination of the risk assessment process and is the final product. Its purpose is to gather all the pertinent results in one place for ease of presentation and to serve as a starting point for discussion of specific mitigation actions. It not only lists the specific areas of concern, but provides detailed location information, summarizes the applicable hazard, problem, and mitigation benefits.

Table 27 North Smithfield's Critical Infrastructure/Community Assets

At Risk	Location	Hazard/Problem	Ongoing Actions	New Mitigation Actions
Flood Prone Drainage Systems, Streets, or Infrastructure	Examples: › Cherry Brook area south of Great Road › Cross Street › Iron Mine Hill Road › Greenville Road (RI 104)-RIDOT › Greene Street › Mechanic Street › School Street- RIDOT › Tifft Road › Brookside Drive-upstream flooding problem › Mattity Road › Pound Hill Road › Bourget Court › Old Smithfield Road southeast- Sayles Hill Rd and Eddie Dowling which had a new system but still unable to handle large amounts of water › Route 146 South at West Acres-RIDOT › Route 146 NB/SB Slatersville exits-RIDOT	› Flooding due to ground saturation. › Branch River flooding. › Undersized drainage infrastructure. › Lack of drainage infrastructure. › Increased storm intensity. › Solar farms with less trees/vegetation have caused more flooding than before.	› Regular street sweeping and stormwater infrastructure maintenance. › Educate homeowner about beaver damage and trapping. Refer inquiries to RIDEM.	1. Conduct a town-wide Hydrologic and Hydraulic (H&H) study. 2. Replace undersized culverts. a. Cherry Brook neighborhood (Meadowbrook Avenue/ Railroad Crossing 2) b. Replace upstream half of Great Road (146A) culvert. c. Replace five culverts at Heroux Drive with a larger box culvert. 3. Clear debris from culverts. a. Upstream end of Heroux Drive. b. Coordinate with Woonsocket to clear debris from culverts such as Rockland Ave and culvert under Railroad Crossing 2. c. Woonsocket Hill Road and/or Pound Hill Road. 4. Improve drainage at Old Smithfield Road between poles 46 and 47 (rushing water), and 60 and 61 (standing water in wood-line and onto road during storm).
Bridges	STIP 2022-2031 › Route 146 Farnum Pike › Route 146A Great Road › Route 146 Spring Brook › Route 104 and Route 5 › Tifft Road	› Floods › Hurricanes/Nor'easters › Heavy rain › Severe winter storms and ice › Evacuation routes go over bridges	› Local inspection of North Smithfield-owned bridges.	5. Obtain variance or MOU to use private property on Tifft Road for emergency evacuation of one property if bridge were to fail.
Wastewater	› Diverted to Woonsocket Wastewater Treatment Plant › Pump station designed for floods is elevated and has flood doors.	› Severe storms that would cut power	› Facilities Assessment done in 2021. › Wastewater › Management Facilities Plan amended 2023.	6. Improve wastewater pump stations at Pound Hill Road and Branch River. 7. Join RiWARN.

Table 27 North Smithfield's Critical Infrastructure/Community Assets (Continued)

At Risk	Location	Hazard/Problem	Ongoing Actions	New Mitigation Actions
Water Supply Systems	› Supplied by the City of Woonsocket to customers in Slatersville, Forestdale, parts of Great Road, Mendon Road, and Industrial Park area. 543 connections. › Majority of Town on private wells.	› Drought › Extreme temps › Flooding	› Agreement w Millville, MA to provide water to residents in Millville that had pollution.	8. Improve drinking water flow throughout town. a. Phase 1: getting water to the northern neighborhoods. b. Phase 2: water distribution within the neighborhoods.
Services/Utilities	RI Energy Substations: › 76 Greenville Road (RI 104) › 231 Greenville Road (RI 104)- floods › Cox Communications Verizon	› Flooding › High winds › Hurricane › Nor'easter	› Greenville to Todd Pond to substation. › Beaver issue: ongoing remediation. › Subdivision regulations require new utility lines to be buried. › Outside vendor hired to do tree clearing and maintenance.	› No new actions at this time.
Communication Equipment	› Mowry Tower and monopile- local and state communication equipment. (800 MHz) › Police and Fire Communication Tower (VHF)	› Wind › Lightning › Severe winter storms and ice		9. Acquire new 800 MHz radios for DPW. 10. North Smithfield School Department to upgrade to town-wide 800 MHz radios.
Dams	› Slatersville Reservoir Upper/Branch River (H) › Slatersville Reservoir Middle/Branch River (H) › Slatersville Reservoir Lower/Branch River (S) › Woonsocket Reservoir #1*/Crookfall Brook (H) › Woonsocket Reservoir #3*/Crookfall Brook (H) › Forestdale Pond Dam/Branch River (H) › +15 Low hazard dams › Pond House Road-low? › Black Plain Hill Road -low?	› Flooding › Development downstream impacts rating		11. Confirm if Forestdale Pond Dam #048 (high hazard) is broken.

Table 27 North Smithfield's Critical Infrastructure/Community Assets (Continued)

At Risk	Location	Hazard/Problem	Ongoing Actions	New Mitigation Actions
Critical Municipal Hazard Response Facilities	› Emergency Shelter at North Smithfield Middle School (1850 Providence Pike) › Town Hall (83 Greene St.) › Police HQ (575 Smithfield Road) › North Smithfield Fire Station 2 (1470 Providence Pike) › North Smithfield Fire Station 1 (675 St. Paul Street) › Emergency Management (83 Greene St.) › DPW Garage (281 Quaker Highway) › Water and Sewer Dept (161 Main St.)	› Flooding › Severe winter storms and ice. › Hurricanes › Nor'easters		12. Secure stable funding to support the Emergency Management Department. 13. Inventory shelter supplies. 14. Take inventory of mobile trailers/pods and move them to the fire station on St. Paul's Street. 15. Create an efficient communication plan for warming/cooling centers. 16. Evaluate effectiveness of CodeRED.
Populations	***Senior/Low-income housing:*** › Deerfield Commons › Gatewood Apartments › Villa at St. Antoine › The Meadows › Colonial Village ***Additional Affordable Housing:*** › Marshfield Commons ***55+ Communities:*** › Laurelwood ***Condominium communities:*** › Rockcliff Farms › High Rocks › Residences at Slater Mill › Silver Pines › Transitional Housing	› All Hazards › Aging population	› Fire Department checks fire alarms and provides fire prevention/safety talk annually at senior living communities. › Evacuation exercise practiced regularly at St. Antoine Residence.	17. Develop an Emergency Evacuation Plan.
Businesses	› Cross St: Commercial building street flooding, low topography	› Flooding › Hazard Awareness	› Social media used to promote emergency alerts.	18. Encourage business participation in CodeRED.
Schools	› Middle School (1850 Providence Pike) › High School (412 Greenville Road) › Elementary School (2214 Providence Pike)	› Severe winter storms and ice › Hurricane › Nor'easter › High wind › Extreme heat	› Schools have equipment to clear sidewalks.	See actions #10 and #15.

Table 27 North Smithfield's Critical Infrastructure/Community Assets (Continued)

At Risk	Location	Hazard/Problem	Ongoing Actions	New Mitigation Actions
Recreation Facilities	› Slatersville Reservoir boat ramp › Ballfields › Recreation buildings (3): NSES, Pacheco Park, Paul Kelly Complex, High school facility	› Flooding › Lightning		None at this time.
Natural Resources	› Trees › Primrose Pond › Wright's Dairy Farm › Goodwin Brothers Farm › Blackstone River/High Rocks Natural and Historic Area › Cedar Swamp Natural and Historic Area › Mattity or Mattetolomitt Meadow Natural and Historic Area › Nipsachuck Natural and Historic Area › Woonsocket Reservoir No. 3 Natural and Historic Area › Groundwater aquifers › Branch River › Blackstone River › Crookfall Brook › The Gorge › Booth Pond -Sousa Property	› High winds › Severe winter storms and ice › Lightning › Flooding/water quality	› Tree management plan is in place.	19. Wetland Preservation. a. Create a digital map of existing wetlands. b. Implement measures (local regulations, education, awareness) to prevent degradation of existing wetlands.
Historic Resources	› Union Village › Slatersville › Forsetdale Historic District › Tyler Mowry House › William Mowry House › Old Smithfield Road Historic District › Slatersville Historic District › Peleg Arnold Tavern › Union Village Historic District › Grange Road › Nipsachuck › Blackstone Heritage Corrido and National Park › School Street Schoolhouse › Mowry Fire Tower - potentially eligible › Local documents/ records.	› Flooding › High winds › Brushfire		None at this time.

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's system. The purpose of the capability assessment is to highlight successes, identify shortcomings, and to lay the groundwork for possible improvement. The Town of North Smithfield 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. This section 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

Capital Improvement Plan (CIP): The Town of North Smithfield Capital Improvements Program prioritizes Town projects while balancing public safety, recreation, community planning, infrastructure, and technology needs. Projects outlined in this plan generally cost over $5,000 and have a minimum five-year life. Example projects include purchase of equipment and structural upgrades. Projects from this HMFMP will be considered for the next update of the CIP. The CIP was reviewed for actions to include in this Plan.

Comprehensive Community Plan: North Smithfield's 2019 Comprehensive Plan identifies actions that can be taken to address increased development pressures, economic stability, open space and recreation issues, and public infrastructure and facilities. It outlines goals, policies, issues, and actions to provide a framework for everyday operations within the Town. North Smithfield recognizes the importance of incorporating mitigation initiatives (both Pre- and Post-Disaster) into the Comprehensive Plan. The following relevant elements were important to highlight for this Plan. This Plan will be used to guide the update of the next Comprehensive Community Plan.

Land Use Element

Action Item 1E: Adopt flexible land use controls that encourage creative land planning concepts such as conservation development design, encourage the preservation of open space, significant natural features and resources, rare or endangered species of habitat, historical structures and features and significant cultural resources and other sensitive areas not otherwise protected by local, state, and federal law.

Action Item 1F: In the review of subdivisions, elements such as streets and lots shall be designed so as to preserve natural features such as prominent trees, stone walls, rock outcroppings, natural landform, and topography.

Services and Facilities Element

Action item 3E –Carry out phased program to enhance system redundancy including development of additional water supply wells, pump stations, water storage facilities and fire hydrants in community water system areas and expand system with emphasis on economic development proprieties and residential areas with greatest needs.

Dam Emergency Action Plans: Dam EAPs are required to be filed with the RIEMA for high and significant hazard dams. As of March 2024, there are no reports for the Slatersville Reservoir Upper dam, the Slatersville Reservoir Middle dam, the Slatersville Lowe dam, or the Forestdale Pond dam. However, the State does have a EAP from 2007 and a 2017 draft for the Woonsocket Reservoir #1 and #3 dams. Finalizing the draft EAPs and completing the outstanding EAPs has been identified as an opportunity for improvement and noted as such in this Plan.

Emergency Operations Plan: The Town has an updated EOP. This plan addresses the response to extraordinary emergency situations associated with natural, man-made, and technological disasters. The Town's Emergency Operations Plan further addresses pre- and post-disaster strategies to affectively deal with the hazards addressed in this plan such as hurricane and flooding evacuation, public warning and sheltering during natural disasters.

MEDS-POD (Medical Emergency Distribution System- Point of Dispensing): Managed by North Smithfield Emergency Management. In 2013 the Town of North Smithfield received an excellent score (96 out of 100) from the R.I. Department of Health for its MEDS-POD Plan. The Town is well equipped to ensure the safe dispersion of medication during a public health emergency.

Land Development and Subdivision Regulations (LDSR): These regulations addresses minimizing hazards to persons and property from inland flooding. Adequate drainage must be provided around slopes, encroachments are prohibited in the regulatory flood zones, and subdivisions must minimize flood damage. The LDSR addresses safety from fire, flood and other hazards.

National Flood Insurance Program (NFIP): The Town of North Smithfield is an active and compliant member of the National Flood Insurance Program since the initial flood insurance rate map in 1978. As such, residents are able to purchase flood insurance to protect their property against flood losses. The Town of North Smithfield has adopted the most recent

(March 2, 2009) Flood Insurance Rate Maps (FIRM) and July 19, 2023 Flood Insurance Study (FIS). 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. The Town has designated the Planning Director as the NFIP Coordinator to manage the program. Article XIV of the Zoning Ordinance is dedicated to Special Flood Hazard Areas, also known as a Floodplain Overlay District.

The Town works regularly with other communities along the Blackstone River Valley to protect valuable natural resources and preserve open space along the river which has helped to reduce flooding and pollution risks.

> ***Community Rating System***: North Smithfield does not currently participate in FEMA's Community Rating System (CRS) Program. Participation in FEMA's CRS would allow flood insurance policy holders up to a 10% discount on their premiums.
>
> ***Floodplain Education:*** The NFIP Coordinator is available to answer questions that residents may have about flood insurance, compliance, or floodplains.
>
> ***Substantial Damage and Substantial Improvement***: The Building Official follows the State Building Code (RIGL 23-27.3-106.0 to 106.5) for guidance on substantial improvements and damages for structures located in floodplain areas. The Town manual tracks the cumulative costs of permits issued for damage and improvements on a property-by-property basis within the floodplain. Using the town-assessed property value as a baseline, they calculate whether the cost of rebuilding exceeds 50% of the building's value. Significant structural damage, such as roof loss or foundation failure, can quickly cause repair costs to surpass this 50% threshold. All work in the floodplain that is deemed as substantial improvements must be rebuilt safely above flood heights to reduce future flood damage.

Sewer Enterprise Fund: This account allows North Smithfield to self-fund future extensions of the system, rather than to borrow funds. This account is funded through annual assessment fees which are collected from property owners who are connected to the sewer system.

Strategy for Reducing Risks from Natural Hazards in North Smithfield, RI: The 2019 Hazard Mitigation Plan was used as a starting point for this 2025 Plan. The demographic information was updated and carried forward, and the hazards of concern and proposed mitigation actions were reviewed and brought to the HMC for discussion. Mitigation actions and current vulnerabilities are incorporated in the Comprehensive Community Plan and were used to support grant applications the town submitted for mitigation actions.

Soil Erosion, Runoff and Sediment Control (SERSC) Plan: Article V of the Town's General Ordinance is dedicated to a soil erosion and sediment control plan, and stormwater pollution prevention plan (SWPPP). The SWPPP ensure proper storm water management of runoff from new development and re-development projects. Potential contaminants in storm water runoff may include suspended solids, nitrogen, phosphorus, hydrocarbons, heavy metals, pathogenic organisms (bacteria and viruses), and road salts.

StormReady Community: As a StormReady Community, recognized by the National Weather Service, the Town of North Smithfield has taken a proactive approach to providing emergency

managers with clear guidelines on operation during hazardous weather. The Town has adopted Standard Operating Procedures to provide guidance in preparing for and dealing with the effects of hazardous weather conditions. If the North Smithfield EMA Director is unable to be reached, responders are encouraged to monitor weather activity through WebEOC, National Weather Service Alerts, and CodeRed. The local and Rhode Island State Police provide National Weather Service Alerts over the Openfox Messenger Service.

***Stormwater Management Program Plan (SWMPP)*:** This 2004 was designed to help the town reduce the discharge of pollutants to the maximum extent practicable, protect water quality and satisfy the water quality requirements of the Federal Clean Water Act and Rhode Island Water Quality standards. The plan prioritizes impaired waters and Special Resource Protection Waters (SRPWs): Slatersville Reservoir, Branch River, Blackstone River, and Tarkiln Brook. These waters are most effected by stormwater runoff.

Wastewater Management Facilities Plan: This 2007 plan presents an analysis of present and future needs of the Town's wastewater collection system. Future development and expansion of the sewer system were also modeled to provide future loads on the Woonsocket Regional Wastewater Treatment Facility.

Zoning Ordinance: The North Smithfield Zoning Ordinance, developed and maintained in accordance with the North Smithfield Comprehensive Plan and chapter 22.2 of Rhode Island General Laws, was designed to manage growth and land use. Section 6.18 of the Zoning Ordinance, Special Flood Hazard Areas and Flood Fringe Lands, was written to ensure public safety, minimize hazards to persons and property from flooding, to protect watercourses from encroachment and to maintain the capability of floodplains to retain and carry off floodwaters. Section 17.5 Environmental impact assessment requires applicants to minimize flooding and erosion and requires environmental impact analysis of proposed developments. This ordinance was reviewed for completeness as per the NFIP.

Departments/Organizations

***Building Department*:** The Building Department is responsible for enforcement of State and Local Building Codes and to ensure that building activities throughout the Town comply with zoning laws and standards.

Conservation Commission: The purpose of the North Smithfield Conservation Commission is to promote and develop the natural resources, to protect the watershed resources and to preserve natural esthetic areas of the town. This group of residents advocate for sound environmental and conservation issues that impact the Town and its' future. The Conservation Commissions can support and promote the actions of this Hazard Mitigation and Floodplain Management Plan.

Emergency Management: The North Smithfield Emergency Management Agency/Homeland Security's (EMA) mission is to protect lives and property when major emergencies threaten public safety in North Smithfield. The North Smithfield Emergency Agency works toward the coordination of an effective townwide response to two types of disasters: natural and man-made. Natural disasters are major storms, i.e. snow, ice, hurricanes, tornadoes, flooding, and severe weather extremes (high heat or cold), earthquakes. Man-made disasters can be

technological disasters including hazardous material incidents, nuclear, biological or radiological, cyber terrorism. As the local Homeland Security agency, the EMA also plans for dealing with and responding to terrorism threats either foreign or homegrown.

The EMA has 20 active volunteer members. Nearly all are Red Cross certified in CPR and basic First Aid as well as traffic control. Some members are now licensed amateur radio operators. Most have completed Community Emergency Response Team training. Many have completed other training such as the use of gas masks, radio operation, search & rescue, crowd control, shelter management, Skywarn severe weather observation and reporting. Homeland Security training includes terrorist incident response, radiological, biological and chemical detection.

Fire Department: The Fire Department provides fire and rescue services including fire suppression, Rhode Island Department of Health EMT-Cardiac Level Services, Technical Rescue, and First Response Hazardous Materials response. They also provide prevention services to include code compliance, plans review, and public education. The Department is supported by 27 active firefighters out of two fire stations. Fire Station #1 is located at 675 St. Paul Street. Fire Station #2 (Headquarters) is located at 1470 Providence Pike. The Fire Department owns and operates the following equipment:

- 3 engines (1 is reserve)
- 3 rescues (1 is reserve)
- 1 tanker truck 3,000 gal
- 2 rescue boats
- 1 ATV
- 1 pickup/utility vehicle
- Various portable pumps and portable generators

Land Trust: The North Smithfield Land Trust, established in 1992, is a private, nonprofit organization established to preserve and protect the land in the town. The Land Trust owns four properties: Booth Pond, Rocky Hill, Mattity Road, and Village Way. This group of citizens works with landowners and the community to conserve land by accepting donations of land, purchasing land, negotiating private, voluntary conservation agreements on land, and stewarding conserved land. The Land Trust can help support some of the efforts proposed in this Hazard Mitigation and Floodplain Management Plan.

Planning Department: The Planning Board and Department studies and prepares plans for the utilization of the resources and satisfaction of the needs of the town, with reference to its physical growth and development as affecting the health, safety, and general welfare of the people and the economy and efficiency of community life. The Planning Board is responsible for the preparation and maintenance of the Comprehensive Plan for the development and improvement of the town. The Planning Board may be assigned tasks by the Town Council in connection with the physical growth and development of the Town. Elements from the Planning Board's work on the LDSR, Comprehensive Plan and Zoning Ordinance are incorporated into the Hazard Mitigation Plan.

Police Department: The North Smithfield Police Department's mission is to provide the highest degree of fairness, professionalism, and integrity while fulfilling the law enforcement

needs of the community. The Department is staffed by 27 sworn police officers and supported by 7 civilian employees. The Department operates twenty-four hours a day and responds to all criminal complaints, calls for service and city-wide emergencies. The Department is located at 575 Smithfield Road and has the following equipment:

- 2 ATVs
- Regional Mobile Command Center
- 5 admin vehicles
- 5 detail cruisers
- 12 to 15 marked cruisers

Public Works Department: The responsibilities of the North Smithfield Public Works Department are to maintain existing facilities, including roadways, drainage systems, bridges, culverts and town parks. The highway division works with RI Energy in the event of an emergency involving storm debris, downed utility lines and downed trees. The Highway Division is also responsible for sidewalk repair and construction, roadway reconstruction and paving, street sweeping, snow plowing and sanding, drainage maintenance repair, pothole repair and brush cutting. The HMFMP will help the Public Works Department prioritize projects and facilitate grant funding applications.

School Department: The three North Smithfield schools include one elementary, a middle, and ahigh school, managed by the School Department. The School Department has their own snow removal equipment and is responsible for keeping the properties safe during inclement weather. All three schools have backup generators, and the middle school is the Town's designated emergency shelter.

Town Administrator: The Town Administrator is the chief executive and administrative officer of the Town and is responsible for the administration of all departments, offices, and agencies. The Town Administrator has the authority to declare a state of municipal emergency in the event of a disaster, or catastrophe which endangers the health, safety or resources of the people of the Town.

Town Council: The North Smithfield Town Council is the policy-determining body of the town. The Town Administrator has the power to declare an emergency affecting the public peace, health, safety, comfort and welfare of the inhabitants of the town and for the protection of persons and property by Town Charter. The Town Council may by ordinance ratify the action of the administrator and/or direct him to take additional or different action in dealing with an emergency. The Town Council may by resolution declare the emergency closed.

Water and Sewer Departments*:* Managed through enterprise funds, this department operates and manages the water system Slatersville Public Supply. Water is purchased and supplied through the City of Woonsocket. All wastewater in North Smithfield is processed at the Woonsocket Wastewater Treatment Plan.

Ability to Expand on Capabilities**:** North Smithfield's ability to expand on some of their services is dependent on the direction of the Town Council and Town Administrator. The Town does have the ability to expand some of its departments and improve the Town's preparation for natural hazards. As explained further in Section 6, the HMC is proposing a series of

mitigation actions to better protect residents and businesses, especially along the streams and rivers as climate conditions change.

The Town of North Smithfield is continually trying to adapt to and mitigate riverine and stormwater flooding. High intensity rain events, which are becoming more frequent, stress the drainage systems that are not meant to convey so much water so quickly. The Town is currently trying to enhance stormwater capabilities through green infrastructure and preserving open space. Finding more ways to handle heavy rain events can help reduce street flooding and improve public safety. Funding for these projects is not readily available; the Town will have to seek outside funding to supplement local budgets.

State Programs

Rhode Island Department of Environmental Management (DEM)

***Division of Law Enforcement**:* The Rhode Island DEM Division of Law Enforcement serves to protect the natural resources and ensure compliance with all environmental conservation laws through law enforcement and education.

Land Revitalization and Sustainable Materials Management

Recreation Trail Grants: provides financial assistance to municipalities and non-profit organizations for the development and maintenance of recreational trails and trail-related projects. This federally funded program receives its funding from a portion of federal gas taxes paid on fuel. Grant funding is dependent on Rhode Island receiving allocation of funds from the Federal Highway Administration.

***Section 319 Nonpoint Source Grant Program**:* to prevent, control or abate nonpoint source pollution to the waters of the state – surface waters (both freshwater and saltwater) and groundwater. The Section 319 competitive grant funds are intended to provide financial assistance for projects that will protect or improve water quality and aquatic habitats, thus enhancing the designated uses of the state's waters by addressing sources of nonpoint pollution, correcting hydromodification issues, and providing for habitat restoration.

Urban and Community Forest Program: This RIDEM Division of Forest Management program supports activities which lead to a more effective and efficient management of urban and community forests and improve public understanding of the benefits of preserving existing tree cover in communities.

Wetland Regulations: RIDEM 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.

Rhode Island Department of Health: The Rhode Island Department of Health (DOH), not only strives to prevent disease and increase health and safety, but they also promote the Special Needs Emergency Registry. By voluntarily enrolling in this list, local police, fire, and

other local first responders can better prepare for and respond to an individual's needs during a disaster.

Rhode Island Department of Transportation: The Rhode Island Department of Transportation (RIDOT) designs, constructs, and maintains the state-owned surface transportation system. This includes not only roads and bridges but also the state's rail stations, tolling program, bike paths and ferry service.

Rhode Island Emergency Management Agency: The Rhode Island Emergency Management Agency (RIEMA) is the State agency assigned to reduce the loss of life and property for the whole community while ensuring that as a State we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all natural, human-caused, and technological hazards. RIEMA is also the pass-through agency for FEMA mitigation funding.

Rhode Island Enhanced 9-1-1 Telephone System: North Smithfield utilizes the state's E-911 system which provides 24-hour public safety communication services from one answering point in North Scituate. Each call is routed to the appropriate response team. The system processes both landline and wireless 9-1-1 calls.

Rhode Island Executive Climate Change Coordinating Council: Established in 2014, the Executive Climate Change Coordinating Council (EC4) sets specific greenhouse gas reduction targets and incorporates consideration of climate change impacts into the powers and duties of all state agencies. The legislation emphasizes the concept of resilience, building on our collective strength to develop practical solutions that allow Rhode Island to "weather the storm." The 13-member Council is chaired by RIDEM.

Rhode Island Infrastructure Bank: Established in 1989, the RI Infrastructure Bank provides fundings (loans, grants, etc.) to finance municipal infrastructure improvements related to water and wastewater, roads and bridges, energy efficiency and renewable energy, and brownfield restoration. This is a potential funding source for stormwater infrastructure improvements.

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 2018 and provides comprehensive construction requirements designed to mitigate the impacts from natural hazards, such as high wind events. The Code is enforced by the North Smithfield Building Department and provides an additional layer of regulatory control to those discussed above.

The State Building Code (RIGL 23-27.3-106.0 to 106.5) covers substantial improvements and substantial damages for structures in the floodplain. If a building is damaged or improved by 50% of the physical value of the building, the code's requirement for flood resistant construction for new structures shall apply.

Rhode Island State Fire Code Regulations: North Smithfield has adopted the Rhode Island Fire Safety Codes to safeguard life and property from the hazards of fire and explosives in accordance with safe practice. The Fire Code provides reasonable minimum requirements for fire prevention and protection. For existing structures, the Fire Code is enforced by the Fire Department for existing structures. The Building Inspector enforces the Fire Code for new structures.

Rhode Island State Dam Safety Program: The Town of North Smithfield participates in the State Dam Safety Program because of the high and significant hazard dams in North Smithfield. 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 2023 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 of remove privately owned dams, inadequate spillway capacities and engineering analyses, lack of Emergency Action Plans across the state, inadequate staffing, and increase in rainstorm intensities.

Other Local Resources

Northern Rhode Island Conservation District: A non-profit agency working with people and groups providing information and technical assistance for activities which protect natural resources such as soil, water, and air.

Preserve Rhode Island: A statewide non-profit dedicated to protecting historic places through advocacy, stewardship, and preservation programs. The organization's Revolving Fund supports repairs for at-risk historic properties.

Rhode Island Energy (Electricity and Natural Gas): Rhode Island Energy is the major provider of natural gas and electricity in the state. Recent initiatives include:

- Improved tree trimming
- Various gas line replacements in conjunction with local paving projects.

United Way 2-1-1: United Way 2-1-1 in Rhode Island is a free, confidential service that provides information, referrals, and is available in multiple languages. This service connects residents with community services they may need such as childcare, housing, health insurance, and tax preparation.

Federal Programs

Community Development Block Grant (CDBG): The United States Department of Housing and Urban Development (HUD) manages the Community Development Block Grant (CDBG) Program. This program supports municipal activities to build stronger and more resilient communities. Activities may address needs such as infrastructure, economic development projects, public facilities installation, community centers, housing rehabilitation, public services, clearance/acquisition, microenterprise assistance, code enforcement, homeowner assistance, etc.

Natural Resource Conservation Service (NRCS): The NRCS is a federal agency that works with landowners to improve and protect soil, water, and other natural resources. In Rhode Island, the NRCS has provided funding for land conservation, watershed conservation, and agriculture conservation.

Federal Emergency Management Agency: The Federal Emergency Management Agency (FEMA), is an agency of the U.S. Department of Homeland Security that coordinates disaster response when local and state resources are maxed out. The agency also provides grant funding for pre-and post-disaster mitigation projects.

Building Resilient Infrastructure and Communities (BRIC): supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. In addition to project selections, the BRIC program offers help to communities in the form of non-financial direct technical assistance that can provide holistic hazard mitigation planning and project support. This competitive grant usually has an annual application period that is open from fall to winter. Final project selections are announced the following summer. The Town of North Smithfield must have a current, FEMA-approved hazard mitigation plan to receive competitive BRIC funding.

Flood Mitigation Assistance (FMA): supports projects which reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. The Town of North Smithfield l must have a current FEMA-approved hazard mitigation plan to receive competitive FMA funding.

Hazard Mitigation Grant Program (HMGP): provides funding to state, local, tribal and territorial governments so they can develop hazard mitigation plans and rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster. The Town of North Smithfield must have a current, FEMA-approved hazard mitigation plan to receive competitive HMGP funding.

Emergency Management Performance Grant (EMPG): provides funding to support local emergency management agencies in carrying out the National Preparedness Goals. The five mission areas include prevention, protection, mitigation, response, and recovery.

Fire Prevention & Safety Grants (FP&S): provides critically needed resources to fire departments and non-profit organizations to carry out fire prevention education and training, fire code enforcement, fire/arson investigation, firefighter safety and health programming, strategic national projects, prevention efforts, and research and development. These competitive grants are available annually.

US Department of Agriculture, Natural Resource Conservation Service (NRCS): provides technical and financial assistance to local governments to help communities implement conservation practices that address watershed resource concerns. NRCS supports programs which reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damage caused by floods and other natural disasters.

US EPA Water Infrastructure Improvements for the Nation (WIIN) Act: provides funds to small, underserved, and disadvantaged communities to assist public water systems in meeting Safe Drinking Water Act requirements.

6

Mitigation Actions

Mission Statement

Preserve and enhance the quality of life, property, and resources by identifying areas at risk from natural hazards and implementing priority hazard mitigation strategies to protect North Smithfield's citizens, infrastructure, and historical, cultural, and natural resources.

Mitigation Goals

To effectuate the mission statement, the Town establishes the following hazard mitigation goals, toward which all action must reach:

1. Protect public health, safety and welfare; minimize social dislocation and distress due to impacts from natural hazards.
2. Prioritize the allocation of resources for mitigation actions that benefit underserved and disadvantaged communities, especially those in high-risk areas.
3. Reduce property and environmental damages caused by natural disasters such as high winds, flooding, and brushfires.
4. Reduce economic losses and minimize disruption to local businesses due to natural hazards.
5. Protect the ongoing operations of critical facilities during and after a storm/event.
6. Expedite recovery disaster mitigation efforts during the recovery phase.

Status of Proposed 2019 Actions

Since the 2019 Hazard Mitigation Plan, the priorities of the community have remained largely unchanged. However, the Town is seeing more nuisance flooding and now aims to prioritize projects to reduce impacts from heavy rain events.

Table 28 Status of Proposed 2019 Actions

Action	Status?	Reason why it is not complete (shift in focus, funding, etc.)	Other comments
1. Mowry Tower: The structure and security of the Tower are of a concern and will be evaluated and repaired.	**In Progress.** **To be completed by end of 2024, early 2025.**	There was no funding or alternative location for equipment until recently.	As of May 2024, with support from congressional earmarks, the Town is working with RIEMA on moving some of the communication equipment off Mowry Tower and onto a new monopole. The Mowry Tower structure is undergoing structural repairs. This is expected to be completed by the end of 2024. No need to move into this plan.
2. While waiting to purchase a bucket truck the Town will hire outside vendors for clearing tress from the right-of-way.	**Completed.**		The Town hired a vendor to do tree work. Other town priorities have come ahead of purchasing a new bucket truck. Town is satisfied with the current arrangement with the vendor. No need to move into this plan.
3. The Town will commission DiPrete Engineering to complete a Hydrologic Study of Cherry Brook Watershed and recommend solutions.	**Completed.**		
4. The Town will work with RIDOT to evaluate how to improve drainage improvements on town roads which are prone to flood during heavy rain events.	**Ongoing.**	This is an ongoing effort and will never be deemed complete.	This is an ongoing action that the town continually engages in. Town-owned roads are managed by the North Smithfield DPW. Drainage on state roads which run through town is evaluated by RIDOT when roadwork is planned. Drainage improvements for specific state-owned roads are included in *Chapter 6 Mitigation Actions* of this plan.
5. Improved EOC to be located in new Town Hall.	**Completed.**		
6. Reach out to dam owners. Contact the owners of private dams and inform them that periodic inspection, maintenance and repair are essential to minimize risk of failure during heavy rain/flood events.	**Completed.**		This action, originally proposed in 2011, was marked as complete in the 2019 update. The current HMC thinks that this can be a useful action for this plan.
7. Public education about fire risk. Educate owners of large tracts of land about the importance of keeping fire roads clear and preventing buildup of fuel on the forest floor.	**Completed.**		This action, originally proposed in 2011, was marked as complete in the 2019 update. The current HMC thinks that this can be a useful action for this plan.

Additional Actions Since Last Plan Update

Additional actions since the last plan update of 2019:

- Village Way retention pond was cleared.
- Meadowbrook Drive culvert was fixed.
- Monopole installed adjacent to Mowry Tower and structural improvements to the Tower.
- Two dedicated hardwire phone lines in Town Hall.

Mitigation Actions

The HMC decided to propose actions that addressed certain vulnerabilities that were identified earlier in the planning process. See *Chapter 4 Risk Assessment*.

The worksheets below summarize a specific problem and proposed possible solution. They also detail the primary tasks to be undertaken, identify an appropriate lead and anticipates financing options.

After all of the action details were completed, the HMC discussed the priority level of each action. The HMC went through each action and decided if it was a high, medium, or low priority for the Town of North Smithfield. This helps to generally prioritize needs when funding becomes available or budgeted. Actions that received a high priority ranking would provide more benefits than low priority items. Understanding that priorities can and will change, it was helpful to document what is important at that moment in time. Having this discussion as a group helped the HMC consider maximum benefits to the entire town, not just individual departments.

The HMC was encouraged to propose a range of mitigation actions regardless of project costs. Some of the less expensive action items such as clearing debris from culverts is a low-cost item but can still provide a lot of benefit to the town by reducing flood frequency. Performing a town-wide hydrologic and hydraulic study is of high importance, yet it will require substantial funds. It is still a high priority for the town to pursue funding and support to get this accomplished. If costs have already been set aside for a particular mitigation action, the HMC prioritized that action to ensure that it was completed, and funds were spent in a timely manner.

Funding and staff time will be the determining factors as to when various actions are completed. The HMC understands that implementation of many of these proposed actions requires the Town to secure external funding.

This HMFMP includes actions which prevent or reduce the consequences of disaster (mitigation), planning and education (preparedness), improved response in the immediate aftermath of an event (response), and improved restoration efforts (recovery). Those which are true mitigation actions are noted as such. 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.

Mitigation Action Priority Level

High: Reduces the greatest risks, is important to accomplish first, or funding is already available.

Medium: May need other actions to be completed first

Low: Less of an impact on safety and property

Implementation 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 Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
1. Conduct a town-wide Hydrologic and Hydraulic (H&H) study.	☒ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness *this will set the town up for future mitigation efforts.	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☒ High ☐ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The town has many undersized culverts or clogged drainage structures and more and more impervious areas. A comprehensive study can help prioritize flood areas and identify solutions. H&H studies are conducted to ensure drainage structures are sized correctly to handle floodwaters, while not inadvertently increasing flooding up or down stream. The studies are performed to measure the volume flow rate of water draining from drainage areas and determine the depth and velocity of flow and forces from flowing water on a surface or at drainage structures. H&H studies are essential to mitigate against flood loss in the future.

Hazard Addressed: Flooding

Benefits	Obstacles	
A more thought-out approach to culvert improvements. More sustainable floodplain management.	Funding. Competing demands for time and money.	
Lead/Champion	**Support**	
North Smithfield Planning Department	North Smithfield DPW	
Potential Funding Sources	**Estimated Cost**	**Timeline**
North Smithfield Capital Improvement Budget	$5M	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Consider ways to capture runoff from solar farms.

Include Route 104/Iron Mine Hill Road and Cross Street. Cross Street surrounded by wetland, nowhere for water to go.

VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
2. Replace undersized culverts. a. Cherry Brook neighborhood (Meadowbrook Avenue/Railroad Crossing 2)	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The Cherry Brook neighborhood experiences chronic flooding associated with smaller, more frequent precipitation events such as the 5-year and the 10-year flow events. Streets of concern include Lapre Road, Woodlawn Road, Meadowbrook Drive, and Cherry Brook Avenue.

Hazard Addressed: Flooding

Benefits	Obstacles	
Fewer property damages due to stream flooding.	Cherry Brook Study needs to be implemented, needs more funding.	
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
North Smithfield Capital Improvement Budget Congressionally directed spending requests (earmarks) FEMA BRIC and HMGP grants	High	☐ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☒ Long Term (more than 5 years)

Other Notes

Recommendation as per the Cherry Brook memo (*See Appendix E): replacement of the Meadowbrook Avenue/ Railroad Crossing 2 culvert with an arch culvert with hydraulic capacity equivalent to a 6-ft diameter circular culvert. Make into a 15-inch pipe. Would need an engineering study first. The study would be a good first step to do within the next 5 years.

VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
2. Replace undersized culverts. b. Replace upstream half of Great Road (146A) culvert.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☐ High ☐ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

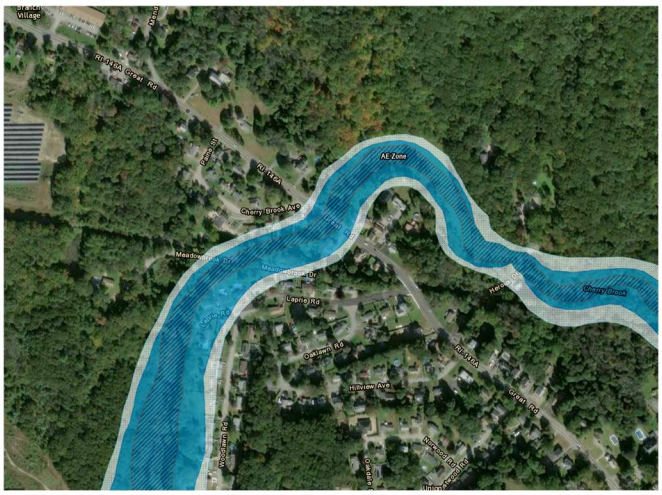
The Cherry Brook neighborhood experiences chronic flooding associated with smaller, more frequent precipitation events such as the 5-year and the 10-year flow events.

Hazard Addressed: Flooding

Benefits	Obstacles	
Fewer property damages due to stream flooding.	Cherry Brook Study needs to be implemented, needs more funding.	
Lead/Champion	**Support**	
RIDOT	North Smithfield DPW	
Potential Funding Sources	**Estimated Cost**	**Timeline**
RIDOT North Smithfield Capital Improvement Budget Congressionally directed spending requests (earmarks) FEMA BRIC and HMGP grants	High	☐ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☒ Long Term (more than 5 years)

Other Notes

Recommendation as per Cherry Brook memo: replace with one similar in dimensions to the downstream half (6.5-ft diameter concrete culvert). RIDOT has initiated this project.



VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
2. Replace undersized culverts. c. Replace five culverts at Heroux Drive with a larger box culvert.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The Cherry Brook neighborhood experiences chronic flooding associated with smaller, more frequent precipitation events such as the 5-year and the 10-year flow events.

Hazard Addressed: Flooding

Benefits	Obstacles	
Fewer property damages due to stream flooding.	Cherry Brook Study needs to be implemented, needs more funding.	
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
North Smithfield Capital Improvement Budget Congressionally directed spending requests (earmarks) FEMA BRIC and HMGP grants	High	☐ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☒ Long Term (more than 5 years)

Other Notes

As per Cherry Brook memo: It is recommended that a structural inspection and evaluation of the Heroux Drive culvert and roadway be performed as the brief visual observations at this location suggested that both the hydraulic opening and roadway are in fair to poor condition. Optional improvements include replacing the five culverts under Heroux Drive with a single larger concrete box culvert and raising the elevation of Heroux Drive to alleviate flooding during large flow events.

VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
3. Clear debris from culverts. a. Upstream end of Heroux Drive.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☐ High ☐ Medium ☒ Low **Action Status** New

Rationale – Why Is This Important?

The Cherry Brook neighborhood experiences chronic flooding associated with smaller, more frequent precipitation events such as the 5-year and the 10-year flow events. A secondary cause of flooding during large storm events may be a decrease in flood storage due to permanently elevated water elevations caused by beaver dams and debris dams.

Hazard Addressed: Flooding

Benefits	Obstacles	
Allow greater flood storage during large flow events. Reduction in property damage due to flooding.	None.	
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
DPW Operating Budget	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Recommendation as per Cherry Brook memo.

- Slow down the water, rather than just trying to contain it.
- Hill management, vegetation, abutments.
- Slower water cannot carry heavy debris which is what causes some blockages.

VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
3. Clear debris from culverts. b. Coordinate with Woonsocket to clear debris from culverts such as Rockland Ave and culvert under Railroad Crossing 2.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☐ High ☐ Medium ☒ Low **Action Status** New

Rationale – Why Is This Important?

Cause for flooding during large storm events may be a decrease in flood storage due to permanently elevated water levels caused by beaver dams and debris dams.

Hazard Addressed: Flooding

Benefits	Obstacles	
Allow greater flood storage during large flow events. Reduction in property damage due to flooding.	Coordinating efforts with neighboring Woonsocket.	
Lead/Champion	**Support**	
North Smithfield DPW	Woonsocket DPW	
Potential Funding Sources	**Estimated Cost**	**Timeline**
DPW Operating Budget	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Recommendation as per Cherry Brook memo.

VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
3. Clear debris from culverts. c. Woonsocket Hill Road and/or Pound Hill Road.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☒ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

Cause for flooding during large storm events may be a decrease in flood storage due to permanently elevated water levels caused by beaver dams and debris dams.

Hazard Addressed: Flooding

Benefits	Obstacles	
Allow greater flood storage during large flow events. Reduction in property damage due to flooding.	None.	
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
DPW Operating Budget	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Not interested in elevating these roads as per Cherry Brook memo.

VULNERABLE AREA: Flood Prone Roads and Drainage Systems

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
4. Improve drainage at Old Smithfield Road between poles 46 and 47 (rushing water), and 60 and 61 (standing water in wood-line and onto road).	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☐ 1 ☐ 5 ☐ 2 ☐ 6 ☐ 3 ☐ 4	☒ High ☐ Medium ☐ Low **Action Status** New

Rationale- Why Is This Important?

During a heavy rain event this area experiences standing water. The Town is concerned about erosion and loss of roadway. At this location, this type of street flooding is brought on by heavy rain events which have become more frequent. Five to ten years ago, the undersized pipes may have just resulted in nuisance flooding. Now, as the town experiences more heavy and frequent rain events, the water backs up onto the road for longer periods of time, making the roads impassable. See cover photo.

Hazard Addressed: Flooding

Benefits	Obstacles	
Fewer road closures due to flooding.	Needs and engineering study first.	
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
North Smithfield Capital Improvement Budget	TBD	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Looking south between poles 46 and 47.

Looking south between poles 60 and 61.

VULNERABLE AREA: Bridges

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
5. Obtain variance/MOU to use private property on Tifft Road for emergency evacuation of one property if bridge were to fail.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☒ 6 ☐ 3 ☐ 4	☐ High ☐ Medium ☒ Low **Action Status** New

Rationale – Why Is This Important?

Getting this variance improves public safety by allowing first responders to respond to properties that are on the other side of a bridge, should the bridge fail.

Hazard Addressed: Hazards such as Nor'easters, hurricane, severe winter storm, high winds, tornadoes, and earthquake which could potentially damage the bridge and isolate residents.

Benefits	Obstacles	
Improved contingency plan for public safety.	Owner consent.	
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
DPW Operating Budget	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

VULNERABLE AREA: Wastewater

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
6. Improve wastewater pump stations at Pound Hill Road and Branch River.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☐ 1 ☒ 5 ☐ 2 ☐ 6 ☒ 3 ☒ 4	☒ High ☐ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

These are the oldest pumps (built in late 1970s) and need repairs to be brought into good working order. The system is approaching full capacity.

Hazard Addressed: Hurricanes, Nor'easter, heavy wind, flooding, or other events which may impact pump station operations.

Benefits	Obstacles	
Public health, minimize disruption to residents and businesses.	Funding.	
Lead/Champion	**Support**	
North Smithfield Water & Sewer Department		
Potential Funding Sources	**Estimated Cost**	**Timeline**
Rhode Island Infrastructure Bank (RIIB) FEMA BRIC grant	Pound Hill Road: $1M Branch Ave: $2.2M	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)
Other Notes		

VULNERABLE AREA: Wastewater

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
7. Join RiWARN.	☐ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☒ Education and Awareness	☒ 1 ☒ 5 ☐ 2 ☐ 6 ☐ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

RiWARN is a Water/**W**astewater **A**gency **R**esponse **N**etwork that allows water and wastewater systems in Rhode Island to receive rapid mutual aid and assistance from other systems in RI to restore facilities damaged by natural or man-made incidents. Utilities sign the RIWARN standard agreement, which then allows them to share resources with any other system in RI that has also signed the standard agreement.

Hazard Addressed: Hurricanes, Nor'easter, heavy wind, flooding, or other events which may impact water and wastewater operations.

Benefits	Obstacles	
Maintaining public health, sanitation, and safety.	None.	
Lead/Champion	**Support**	
Water & Sewer Department		
Potential Funding Sources	**Estimated Cost**	**Timeline**
Water & Sewer Department Operating Budget	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

See https://www.riwarn.org/

VULNERABLE AREA: Water Supply

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
8. Improve drinking water flow throughout town. a. Phase 1: getting water to the northern neighborhoods. b. Phase 2: water distribution within the neighborhoods.	☒ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☒ 2 ☐ 6 ☐ 3 ☐ 4	☒ High ☐ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The town has a fragmented water supply system. The system will struggle to meet the needs of future development without investment in infrastructure. Northern part of town has inadequate flow due to small pipes. There isn't a lot of reserve water for fire suppression.

Hazard Addressed: Drought, extreme temperatures, brushfire

Benefits	Obstacles	
Maintaining public health, sanitation, and safety		
Lead/Champion	**Support**	
Water and Sewer Department		
Potential Funding Sources	**Estimated Cost**	**Timeline**
Phase 1 is underway thanks to Congressional direct spending. Phase 2: Congressional direct spending.	Phase 1: $2.6M Phase 2: $2.2M	☒ Short Term (0-3 years) ☒ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

There is a grant to get water to some neighborhoods but need funding for Phase 2.

St. Paul Street-Mendon Road water line project was budgeted by EPA for $1.1M through the congressional earmark by U.S. Senator Jack Reed. Reed secures grant for Mowry Tower, $1.1 million for St. Paul Street water line extension - NRI NOW

VULNERABLE AREA: Communication Equipment

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
9. Acquire new 800 M Hz radios for DPW.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☒ 6 ☐ 3 ☐ 4	☒ High ☐ Medium ☐ Low **Action Status** New

RATIONALE- WHY IS THIS IMPORTANT?

There is an opportunity to upgrade the DPW radios to 800 MHz in coordination with the relation of the communication equipment from Mowry Tower to a new monopole. The 800 MHz system is used by first responders across Rhode Island. Mowry Tower is an older wooden structure susceptible to damage from fires, lightning, or high winds.

Hazard Addressed: All hazards (Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, and electromagnetic pulses) as it relates to emergency communication.

Benefits	Obstacles	
Reliable communication. Safety of citizens, safety and security of first responders.		
Lead/Champion	**Support**	
North Smithfield DPW		
Potential Funding Sources	**Estimated Cost**	**Timeline**
Town Capital Reserves	$50,000	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

"The steel tower, built in 1956 sits on a 586-foot hill believed to be the highest point in town, and was once used as critical tool for locating fires in the region. Mowry Fire Tower still holds antennas relied on by everyone from the town's Department of Public Works to the local bus company, but the accompanying building has fallen into disrepair. The 65-foot-high tower is in the National Historic Lookout Register and is one of just three such forest fire towers still standing in northern Rhode Island." *Sandy Hall, Northern Rhode Island News on the Web*. https://nrinow.news/2022/05/10/reed-secures-grant-for-mowry-tower-1-1-million-for-st-paul-street-water-line-extension/

Mowry Tower improvements ($140,000) funded via congressional earmark for commerce, justice, and science as a public safety communications equipment upgrade.

https://www.valleybreeze.com/news/riema-calls-on-mowry-fire-tower-for-radio-support/article_608d5aa8-d5f0-11ec-9f96-3770dfb6793d.html

VULNERABLE AREA: Communication Equipment

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
10. North Smithfield School Department to upgrade to town-wide 800 MHz radios.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☒ 5 ☐ 2 ☐ 6 ☐ 3 ☒ 4	☒ High ☐ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The town has an opportunity to upgrade their communication equipment to extend coverage for the 800 MHz emergency service radios. The School Department may need to upgrade only a few radios, not their entire system.

Hazard Addressed: All hazards (Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, and electromagnetic pulses) as it relates to emergency communication.

Benefits	Obstacles	
Reliable town-wide emergency communication.		
Lead/Champion	**Support**	
School Department	North Smithfield EMA	
Potential Funding Sources	**Estimated Cost**	**Timeline**
Town Capital Reserves	$3,000	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)
Other Notes		

VULNERABLE AREA: Dams

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
11. Confirm if Forestdale Pond Dam #048 (high hazard) is broken.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☐ 3 ☐ 4	☐ High ☐ Medium ☒ Low **Action Status** New

Rationale – Why Is This Important?

The dam may have failed and may be releasing more water downstream than anticipated.

Hazard Addressed: Dam failure

Benefits	Obstacles	
Improved dam operation.		
Lead/Champion	**Support**	
North Smithfield Planning Department	DPW	
Potential Funding Sources	**Estimated Cost**	**Timeline**
Planning Department Operating Budget	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

No Dam EAP on record.
Unknown owner.
Located in North Smithfield.
Last inspected in 2017.
Condition Assessment: Poor
Branch River

VULNERABLE AREA: Critical Municipal Hazard Response Facilities

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
12. Secure stable funding to support the North Smithfield Emergency Management Department.	☐ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☒ Education and Awareness	☒ 1 ☒ 5 ☐ 2 ☒ 6 ☐ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The Department does not have a yearly operating budget. Currently emergency management staff are paid a stipend via Town and State EMA funds.

Hazard Addressed: Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, electromagnetic pulses.

Benefits	Obstacles	
Enhanced Emergency Response team.		
Lead/Champion	**Support**	
North Smithfield EMA	Town Administration	
Potential Funding Sources	**Estimated Cost**	**Timeline**
FEMA Emergency Management Performance Grant FEMA Homeland Security Grant Program	$100,000 (maintenance, salary, admin, equipment)	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)
Other Notes		

VULNERABLE AREA: Critical Municipal Hazard Response Facilities

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
13. Inventory shelter supplies.	☐ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☒ Education and Awareness	☒ 1 ☒ 5 ☐ 2 ☐ 6 ☐ 3 ☐ 4	☐ High ☐ Medium ☒ Low **Action Status** New

Rationale – Why Is This Important?

The town does not frequently open their emergency shelter located at the North Smithfield Middle School; supplies may need to be re-stocked.

Hazard Addressed: All hazards (Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, and electromagnetic pulses) as it relates to disaster response.

Benefits	Obstacles	
Enhanced emergency preparedness.		
Lead/Champion	**Support**	
North Smithfield EMA		
Potential Funding Sources	**Estimated Cost**	**Timeline**
Part of the daily duties of the EMA staff paid a stipend.	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

May be a good task for the CERT team.

VULNERABLE AREA: Critical Municipal Hazard Response Facilities

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
14. Take inventory of mobile trailers/pods and move them to the fire station on St. Paul's Street.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☐ 1 ☒ 5 ☐ 2 ☐ 6 ☐ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The EMA trailers have been neglected and may be able to be put back into service. One has CERT supplies and the other has radio equipment and office space.

Hazard Addressed: All hazards (Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, and electromagnetic pulses) as it relates to post-disaster response.

Benefits	Obstacles	
Better disaster response preparedness.		
Lead/Champion	**Support**	
North Smithfield EMA	Fire Chief	
Potential Funding Sources	**Estimated Cost**	**Timeline**
Part of the daily duties of the EMA staff paid a stipend.	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

VULNERABLE AREA: Critical Municipal Hazard Response Facilities

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
15. Create an efficient communication plan for warming/cooling centers.	☐ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☒ Education and Awareness	☒ 1 ☐ 5 ☒ 2 ☐ 6 ☐ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The town has identified a need for better communication among all parties to open schools for warming/cooling centers. In addition to communicating with facility operators, the town can do a better job at communicating the availability of the warming/cooling shelters to the public.

Hazard Addressed: Severe winter storms, extreme temperatures

Benefits	Obstacles	
The town is more likely to open warming/cooling centers to the public.		
Lead/Champion	**Support**	
North Smithfield Fire Chief	North Smithfield EMA	
Potential Funding Sources	**Estimated Cost**	**Timeline**
FEMA Emergency Management Performance Grant FEMA Homeland Security Grant Program	$50,000	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Incorporate the communication plan into the evacuation plan.

VULNERABLE AREA: Critical Municipal Hazard Response Facilities

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
16. Evaluate effectiveness of CodeRED.	☐ Local Plans and Regulations ☒ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☐ 3 ☒ 4	☒ High ☐ Medium ☐ Low **Action Status** New

RATIONALE – WHY IS THIS IMPORTANT?

CodeRED is a web-based product which enables local officials to communicate time-sensitive, personalized messages via voice, email and text messaging. North Smithfield first responders can benefit from documenting CodeRED responsibilities and coming to an agreement on what types of messaging it should be used for.

Hazard Addressed: All hazards (Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, and electromagnetic pulses) as it relates to emergency messaging.

Benefits	Obstacles	
Better emergency communication to residents and local employees.		
Lead/Champion	**Support**	
North Smithfield EMA	Police, Fire, Administration	
Potential Funding Sources	**Estimated Cost**	**Timeline**
Operating Budget for Police and Fire Departments.	Staff time	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

Coordinate with RIEMA's Critical Incident Management Software (CIMS) Coordinator.

If it proves to be a useful tool for the town, promote enrollment to residents and local business employees. See Action #19.

VULNERABLE AREA: Populations

Mitigation Action	Mitigation Type	Alignment With Plan Goals	Action Priority
17. Develop an Emergency Evacuation Plan.	☒ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 5 ☐ 2 ☐ 6 ☐ 3 ☐ 4	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

The town does not have an emergency evacuation plan. Parts of the plan may be proprietary, but the public-facing maps can provide improved transparency for what to expect during a disaster.

Hazard Addressed: Hurricanes, Nor'easters, flooding, dam failure.

Benefits	Obstacles	
Coordinated evacuation effort within North Smithfield.	There hasn't been a need to evacuate so getting the resources lined up to complete this action may be difficult.	
Lead/Champion	**Support**	
North Smithfield EMA	North Smithfield Fire and Police Departments	
Potential Funding Sources	**Estimated Cost**	**Timeline**
FEMA Emergency Management Performance Grant	$50,000	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

As of August 2024, RIEMA and RIDOT are currently assessing/updating the evacuation maps.

Planning Department to find previous work on Evacuation Maps.

Include phases into the plan.

Incorporate the communication plan into the evacuation plan.

VULNERABLE AREA: Businesses

Mitigation Action	Mitigation Type	Alignment With Plan Goals		Action Priority
18. Encourage business participation in CodeRED.	☐ Local Plans and Regulations ☐ Structure and Infrastructure ☐ Natural Systems Protection ☒ Education and Awareness	☒ 1 ☐ 2 ☐ 3 ☒ 4	☐ 5 ☐ 6	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

CodeRED is a web-based product which enables local officials to communicate time-sensitive, personalized messages via voice, email and text messaging. Local employees who do not live in North Smithfield may not be aware of road closures or other warnings disseminated via CodeRED.

Hazard Addressed: All hazards (Nor'easters, hurricanes, severe winter storms, flooding, high winds, extreme temperatures, brushfires, lightning, drought, dam failure, tornadoes, earthquakes, and electromagnetic pulses) as it relates to emergency messaging.

Benefits	Obstacles	
Better hazard awareness. Increased time for preparedness. Improved communication within the community.	This will be most effective if the town is able to organize resources, and fully commit to using the system. See Action #16.	
Lead/Champion	**Support**	
North Smithfield EMA	North Smithfield Police and Fire Departments.	
Potential Funding Sources	**Estimated Cost**	**Timeline**
Operating Budget for Police and Fire Departments.	Staff time.	☒ Short Term (0-3 years) ☐ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

VULNERABLE AREA: Schools

See Actions #10 and 15.

VULNERABLE AREA: Natural Resources

Mitigation Action	Mitigation Type	Alignment With Plan Goals		Action Priority
19. Wetland Preservation a. Create a digital map of existing wetlands. b. Implement measures (local regulations, education, awareness) to prevent degradation of existing wetlands.	☐ Local Plans and Regulations ☐ Structure and Infrastructure ☒ Natural Systems Protection ☐ Education and Awareness	☒ 1 ☐ 2 ☒ 3 ☐ 4	☐ 5 ☐ 6	☐ High ☒ Medium ☐ Low **Action Status** New

Rationale – Why Is This Important?

In order to protect wetlands, they first need to be located. Wetlands act as natural filters and reduce impacts from flooding.

Hazard Addressed: Flooding, extreme temperatures, brushfire, drought.

Benefits	Obstacles	
Wetlands are ecosystems for plants and animals, act as a natural water filter, drawing sediments out of the water, and improve flood capacity.	Other demands and priorities of the town.	
Lead/Champion	**Support**	
North Smithfield Conservation Commission	North Smithfield Planning Department	
Potential Funding Sources	**Estimated Cost**	**Timeline**
EPA Wetland Program Development Grants Green Economy Bond	Mapping: $120,000 Implementation: $15,000	☐ Short Term (0-3 years) ☒ Medium Term (3-5 years) ☐ Long Term (more than 5 years)

Other Notes

The Town has an ongoing partnership with RIDEM to create/preserve open space.

Table 29 Summary of Actions

Action	Priority Level	Action	Priority Level	Action	Priority Level
1. Conduct a town-wide Hydrologic and Hydraulic (H&H) study.	HIGH	3. Clear debris from culverts. c. Woonsocket Hill Road and/or Pound Hill Road	Medium	3. Clear debris from culverts. a. Upstream end of Heroux Drive.	Low
4. Improve drainage at Old Smithfield Road between poles 46 and 47 (rushing water), and 60 and 61 (standing water in wood-line and onto road).	HIGH	7. Join RiWARN.	Medium	3. Clear debris from culverts. b. Coordinate w Woonsocket to clear debris from culverts such as Rockland Ave and culvert under Railroad Crossing 2.	Low
6. Improve wastewater pump stations at Pound Hill Road and Branch River.	HIGH	12. Secure stable funding to support the North Smithfield Emergency Management Department.	Medium	5. Obtain variance/MOU to use private property on Tifft Road for emergency evacuation of one property if bridge were to fail.	Low
8. Improve drinking water flow throughout town. a. Phase 1: getting water to the northern neighborhoods. b. Phase 2: water distribution within the neighborhoods.	HIGH	14. Take inventory of mobile trailers/pods and move them to the fire station on St. Paul's Street.	Medium	11. Confirm if Forestdale Pond Dam #048 (high hazard) is broken.	Low
9. Acquire new 800 MHz radios for DPW.	HIGH	15. Create an efficient communication plan for warming/cooling centers.	Medium	13. Inventory shelter supplies.	Low
10. North Smithfield School Department to upgrade to town-wide 800 MHz radios	HIGH	17. Develop an Emergency Evacuation Plan.	Medium		
16. Evaluate effectiveness of CodeRED.	HIGH	18. Encourage business participation in CodeRED.	Medium		
2. Replace undersized culverts. a. Cherry Brook neighborhood (Meadowbrook Avenue/ Railroad Crossing 2).	Medium	19. Wetland Preservation a. Create a digital map of existing wetlands. b. Implement measures (local regulations, education, awareness) to prevent degradation of existing wetlands.	Medium		
2. Replace undersized culverts. b. Replace upstream half of Great Road (146A) culvert.	Medium				

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7

Implementation and Adoption

Implementing the Plan

The Town of North Smithfield and the North Smithfield Hazard Mitigation Committee 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 Community Plan, Emergency Operations Plan, and site plan review process. It is intended that this plan and the ongoing efforts of the HMC will preserve and enhance the quality of life, property, and resources for the Town of North Smithfield.

Adoption of this mitigation plan increases North Smithfield's eligibility for federal hazard mitigation grants. These grants originate from FEMA's Pre-Disaster Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), Building Resilient Infrastructure in Communities (BRIC) and post-disaster Hazard Mitigation Grant (HMGP) Programs.

Monitoring and Evaluation

The HMC, under the leadership of the Planning Director, will meet bi-annually (or more frequently if necessary), to monitor and evaluate the actions contained in the plan. This bi-annual review will occur in the month the plan was adopted (expected in December) and six months thereafter. During the bi-annual evaluation process, the mitigation actions will be promoted online for public review. Comments and suggestions will be sent directly to the Planning Office or brought up at the advertised bi-annual meeting.

At each bi-annual meeting, the committee members will discuss the actions assigned to them to ensure continual progress with mitigation efforts. The planning process status of each mitigation action will be documented, in a spreadsheet, and minutes recorded for the record. The HMC will base its evaluation on whether the actions have met the following criteria: increased public awareness/education, reduction in hazard damage potential, actions being implemented in the designated time frames, and actions staying within the cost estimate. The HMC will document its findings and provide a bi-annual summary report to the Town Council.

The HMC 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 HMC as priorities shift.

Revisions

Recognizing that this is a living document, the HMC will make changes to it after a disaster, as conditions warrant. Otherwise, it is expected that a revised plan will be adopted every five years. These revisions will reflect changes to hazards, existing conditions, priorities, and funding strategies.

Eighteen months to two years before the plan is expected to expire, the Town will begin to secure funding for a plan update.

Eighteen before the current plan is expected to expire, the Town will either secure a third-party contractor to lead the update effort or identify a lead in-house. A full revision of the plan will commence at least a year in advance of the current plan expiration date to ensure the Town always has an up-to-date plan. The Town should plan on spending nine months updating the plan before it is submitted to RIEMA and FEMA for review. The RIEMA and FEMA review should expect to take up to six months.

During the next plan revision, the Town will enhance the breadth of the HMC to be more inclusive. Prior to finalizing the HMC, the Town will also consider organizations or businesses that may provide valuable insight to the plan update. If invitees cannot commit to being on the HMC, they may be designated as a stakeholder and brought into the conversation as needed.

All future meetings will again be open to the public and it is the hope of the HMC that once the public education and outreach actions begin, public involvement in the Plan will increase and will be reflected in future revisions.

The HMC 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.

Revised plans will be sent to the neighboring communities for comment.

The revised plan/update will incorporate a formalized process for prioritizing actions and weighing the cost/benefit of such actions. See FEMA's *Local Mitigation Planning Policy Guide*, Effective April 19, 2023 https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf. All updates or revisions to the plan will be submitted to RIEMA and FEMA.

Adoption

After each evaluation cycle (every 5 years), a FEMA-compliant North Smithfield Hazard Mitigation and Flood Management Plan will be presented to and adopted by the Town Council. The associated ordinance documentation will be kept as part of this plan.

Appendix A: Survey Results

North Smithfield Hazards Perception Survey

102	09:07	Active
Responses	Average time to complete	Status

1. How long have you lived in North Smithfield?

Less than a year	1
1 to 5 years	12
6 to 9 years	9
10 to 19 years	19
20 years or more	56

2. What is your primary connection to North Smithfield?

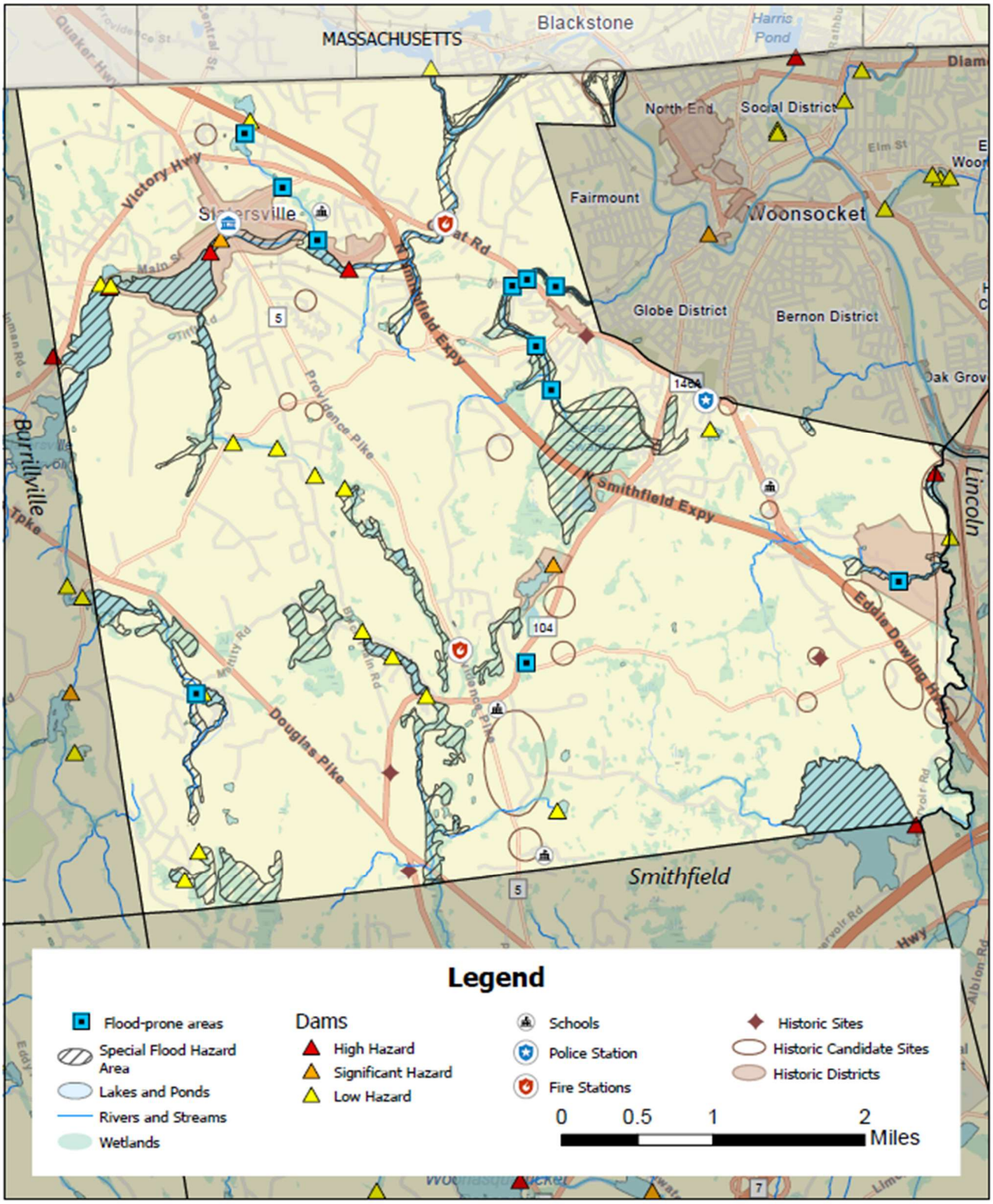
Resident	84
Business Owner	1
Resident and Business Owner	8
Non-Resident Property Owner	0
Local Employee	4

Appendix B: Public Outreach

Town Council Agenda to be inserted.

Public Notices to be inserted.

Appendix C: Community Assets Map



North Smithfield Community Assets and Vulnerable Areas

Sources: RIGIS 2024, Hazard Mitigation Planning Committee 2024

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Appendix D: HAZUS Report

Full report to be inserted.

Hazus: Hurricane Global Risk Report

Region Name: NSmithfield

Hurricane Scenario: 1954-CAROL

Print Date: Thursday, May 16, 2024

Appendix E: Cherry Brook Memo

Full report to be inserted.