

Hazard Mitigation Plan

May 2020

Town of Becket, Massachusetts



Becket Town Hall

557 Main Street

Becket, MA 01223

Phone: 413-623-8934

Web: www.townofbecket.org

HAZARD MITIGATION PLAN

TOWN OF BECKET, MASSACHUSETTS

MAY 2020

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Acknowledgements

The Town of Becket would like to thank the following people and organizations for supporting the development of this plan. This group was considered the Core Team throughout the planning process.

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Forestry Specialist	Jim	Peters
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Police Chief (EMD)	Kris (Kristopher)	McDonough
Highway Department	Chris	Bouchard
Select Board member	Chris	Swindlehurst

Certificate of Local Adoption

TOWN OF BECKET, MASSACHUSETTS

TOWN COUNCIL

A RESOLUTION ADOPTING THE

TOWN OF BECKET 2020 LOCAL HAZARD MITIGATION PLAN

WHEREAS, the Town of Becket established a Committee to prepare the **2020 LOCAL HAZARD MITIGATION PLAN UPDATE**; and

WHEREAS, the Town of Becket participated in the development of the Town of Becket **2020 LOCAL HAZARD MITIGATION PLAN UPDATE**;

and WHEREAS, the Town of Becket **2020 LOCAL HAZARD MITIGATION PLAN** contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Becket, and

WHEREAS, a duly noticed public meeting was held by the Becket Board of Selectmen on _____ for the public and municipality to review prior to consideration of this resolution; and

WHEREAS, the Town of Becket authorizes responsible departments and/or agencies to execute their responsibilities demonstrated in the plan,

NOW, THEREFORE BE IT RESOLVED that the Town of Becket Board of Selectmen formally approves and adopts the Town of Becket **2020 LOCAL HAZARD MITIGATION PLAN**, in accordance with M.G.L. c. 40.

ADOPTED AND SIGNED by the Becket Board of Selectmen on this _____, 2020.

Record of Changes

This 2020 Local Hazard Mitigation Plan, including Appendices, will be reviewed and approved on a biannual basis by the Mitigation Planning Team and following any major disasters. All updates and revisions to the plan will be tracked and recorded in the following table. This process will ensure the most recent version of the plan is disseminated and implemented by the Town.

Table 1. Summary of changes.

Date of Change	Entered By	Summary of Changes

Table of Contents

Acknowledgements.....	2
Certificate of Local Adoption	3
Record of Changes	4
Table of Contents	5
Chapter 1. Introduction	7
Combined with Municipal Vulnerability Preparedness.....	8
Purpose of the Plan.....	8
Guiding Principles for Plan Development	8
Mitigation Goals.....	9
Plan Update and Changes	10
Authority and Assurances	11
Plan Adoption	11
Document Overview	11
Chapter 2. Town of Becket Profile	13
Population and Housing.....	16
Infrastructure and Public Facilities.....	17
Land Use.....	21
Future Development.....	24
Chapter 3. Planning Process	26
Core Team.....	27
Stakeholder Engagement.....	27
CRB Workshop	28
Public Outreach.....	29
Review of Draft Plan	31
Review and Incorporation of Existing Studies.....	31
Berkshire County Hazard Mitigation Plan, November 5, 2012	32
Massachusetts Hazard Mitigation and Climate Adaptation Plan, 2018.....	32
Chapter 4. Risk and Vulnerability Assessment	33
Hazard Identification.....	33
Hazard Profiles.....	37
Changes in Precipitation	38
Rising Temperatures	47
Extreme Weather	56
Non-Climate Influenced Hazards	67
Technological and Human Caused Hazards	70
Critical Facilities	75
Historic Properties	77
National Flood Insurance Program Insured Structures.....	78
Summary of Vulnerability	78
Chapter 5. Capability Assessment.....	81
Strengths and Assets.....	81

Town of Becket, MA Hazard Mitigation Plan

Infrastructural Strengths.....	82
Societal Strengths	82
Environmental Strengths	84
Planning and Regulatory Capabilities.....	86
Administrative and Technical Capabilities	86
Financial Capabilities.....	87
Education and Outreach Capabilities.....	87
National Flood Insurance Program Participation	87
Summary of Findings and Conclusions.....	89
Chapter 6. Mitigation Strategy	90
Mitigation Goals.....	90
Mitigation Actions.....	91
Comprehensive Range of Mitigation Actions	92
Mitigation Action Plan	94
System to Integrate this Plan with other Planning Mechanisms	117
Possible funding sources.....	118
Federal Emergency Management Agency (FEMA) Mitigation Grants	118
Municipal Vulnerability Preparedness Action Grants.....	119
Project types include:	119
Additional Grant Sources	120
Chapter 7. Keeping the Plan Current	122
Continued Public Participation	122
Method and Schedule for Keeping the Plan Current	123
Responsible Parties for Plan Implementation and Maintenance.....	125
Appendix	126
Appendix A: Planning Process Supporting Materials	126
Core Team Meeting 11/25/2019	126
Core Team Meeting 1/27/2020	128
MVP Workshop Flyer	129
CRB Workshop Agenda	130
MVP Mini Session Sign-in Sheets.....	135
Becket Listening Session Zoom Meeting Attendees	139
Housatonic Valley Association: Planning for Flood Resilient and Fish-Friendly Road-Stream Crossings, Project Fact Sheet 02/2020	140
Appendix B: Capability Assessment Supporting Materials	144
Community Information Sheets.....	144
Safe Growth Survey	150
Appendix C: Mitigation Strategy Supporting Materials	153
Hazard Mitigation Actions in Priority Order	153
Appendix D: Plan Implementation Supporting Materials	156
Mitigation Plan Evaluation Worksheet	156
Mitigation Action Progress Worksheet.....	158

Town of Becket Hazard Mitigation Plan Update

Chapter 1. Introduction

¹Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards (44 CFR 201.2). Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.²

In 2014, FEMA wrote, “The purpose of mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. Mitigation plans form the foundation for a city’s long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. The planning process is as important as the plan itself. It creates a framework for risk-based decision-making to reduce damages to lives, property, and the economy from future disasters.”³

FEMA’s *Disaster Mitigation Act of 2000* states, “DMA 2000 (Public Law 106-390)⁴ provides the legal basis for FEMA mitigation planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for State, local, and Indian Tribal entities to closely coordinate mitigation planning and implementation efforts.”⁵

The Town of Becket, Massachusetts created this plan as part of an ongoing effort to reduce the negative impacts and costs from damages associated with natural hazards, such as nor’easters, floods, and hurricanes. This plan meets the requirements of the Disaster Mitigation Act 2000. More importantly, the plan was created to reduce loss of life, land, and property due to natural hazards that affect the Town of Becket. It is difficult to predict when natural hazards will impact the planning area, but it is accurate to say that they will. By implementing the mitigation actions listed in this plan, the impact of natural hazards will be lessened.

Local Mitigation Plans must be updated at least once every five years in order to remain eligible for FEMA hazard mitigation project grants.

¹ Throughout this document, text formatted like this indicates a direct requirement from the FEMA guide to developing local mitigation plans (cited below).

² Federal Emergency Management Agency. (2011). *Local Plan Review Guide*.

³ Federal Emergency Management Agency. (2014). *Multi-Hazard Mitigation Planning*. Retrieved from <http://www.fema.gov/multi-hazard-mitigation-planning>

⁴ Disaster Mitigation Act of 2000, Pub. L. 106-390, as amended.

⁵ Federal Emergency Management Agency. (2014). *Disaster Mitigation Act of 2000*. Retrieved from <http://www.fema.gov/media-library/assets/documents/4596?id=1935>

Town of Becket Hazard Mitigation Plan Update

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grants. (44 CFR §201.6(d)(3))

Combined with Municipal Vulnerability Preparedness

The previous Hazard Mitigation Plan was a regional plan written by the Berkshire Regional Planning Commission and adopted in 2012. This document serves as an update to that plan. Another significant change was in the planning process; development of this plan was in conjunction with the Municipal Vulnerability Preparedness (MVP) program implemented by the Town. All aspects of the MVP program influenced development of this plan, including the Core Team, the Community Resilience Building Workshop, and the listening sessions. The Planning Process chapter details how the MVP program was incorporated.

Purpose of the Plan

The purpose of the Local Hazard Mitigation Plan is to provide the Town of Becket (known throughout this document as *the planning area*) with a comprehensive examination of all natural hazards affecting the area, as well as a framework for informed decision-making regarding the selection of cost-effective mitigation actions. When implemented, these mitigation actions will reduce the Town's risk and vulnerability to natural hazards.

This plan is a result of a collaborative effort between the Town of Becket and the surrounding communities. Throughout the development of the plan, the Core Team consulted the public for input regarding identified goals, mitigation actions, risk assessment, and mitigation implementation strategy.

Guiding Principles for Plan Development

The Core Team adhered to the following guiding principles in the plan's development. Guiding Principles for Plan Development:⁶

- Focus on the mitigation strategy. The mitigation strategy is the plan's primary purpose. All other sections contribute to and inform the mitigation strategy and specific hazard mitigation actions.
- Process is as important as the plan itself. In mitigation planning, as with most other planning efforts, the plan is only as good as the process and people involved in its development. The plan should also serve as the written record, or documentation, of the planning process.
- This is your community's plan. To have value, the plan must represent the current needs and values of the community and be useful for local officials and stakeholders. Develop the mitigation plan in a way that best serves your community's purpose and people.

⁶ Federal Emergency Management Agency. (2013). *Local Mitigation Planning Handbook*, I-2.

Town of Becket Hazard Mitigation Plan Update

Mitigation Goals

The Core Team identified the following list of hazards to profile. They are shown in Table 3, in order of climate change interaction for consistency with the Massachusetts' Hazard Mitigation and Climate Adaptation Plan.

Table 2. Hazards considered.

Primary Climate Change Interactions	Hazards
Changes in Precipitation	Flooding (including culvert issues, ice jams, beaver dams, and other flood-related hazards) Drought
Rising Temperatures	Average/Extreme Temperatures Wildfires Invasive Species
Extreme Weather	Hurricanes/Tropical Storms Severe Winter Storm/Nor'easter (including heavy snow, ice storms, blizzards) Tornadoes Severe Weather (including high winds, hail, extreme precipitation)
Non-climate-influenced Hazards	Earthquake
Technological and Human-caused Hazards	Dam Failure

The hazard mitigation strategy is the culmination of work presented in the planning area profile, risk assessment, and capability assessment. It is also the result of multiple meetings and sustained public outreach. The Core Team developed the five goals shown in Figure 1. The goals from the 2012 Hazard Mitigation Plan were revised to develop this current list. Information about the goal development process is in Chapter 6. Mitigation Strategy. These goals are considered “broad policy-type statements”⁷ that represent the long-term vision for mitigating risk to natural hazards in the Town of Becket. Below is the current list of mitigation plan goals:

1. Reduce losses of life, property, infrastructure and cultural resources from natural hazards and climate change.
2. Prioritize green solutions and environmental protection when implementing all mitigation actions.
3. Investigate, design, and implement infrastructure projects to reduce and minimize the risk of flooding.
4. Increase public awareness of natural hazard risks and mitigation activities through education and outreach.

⁷ Federal Emergency Management Agency. (2013). *Local Mitigation Planning Handbook*, 6.

Town of Becket Hazard Mitigation Plan Update

5. Integrate hazard mitigation principles into Town government regulations and plans.

Plan Update and Changes

The previous mitigation plan from 2012 was reviewed for the development of this plan but it was not updated. This plan should be considered a completely new; as the majority of the content is new. This plan is just for the Town of Becket. The Berkshire Regional Planning Commission had the opportunity to review the draft plan.

*D1. Was the plan revised to reflect changes in development?
(Requirement §201.6(d)(3))*

Changes were incorporated based on changes related to growth, hazard risk, and priorities. The Town anticipates that climate change has and will continue to impact hazards. The Town Profile and critical facility list were completely updated for this plan. There has not been a lot of development in Becket however, the new critical facility list does include information regarding generators. The Massachusetts State Hazard Mitigation and Climate Adaptation Plan of September 2018 was referred to regularly, and a lot of content was extracted from it for the Town of Becket Risk Assessment. The Town of Becket adopted the state's methodology for categorizing hazards based on climate change interaction. Details from the State Plan were used to understand risk in the Town of Becket. The plan was developed in conjunction with the MVP project. A lot of the high hazard areas and mitigation actions were developed by the community. For this reason, adapting to climate change is a priority for Becket.

*D2. Was the plan revised to reflect progress in local mitigation efforts?
(Requirement §201.6(d)(3))*

The Mitigation Strategy chapter details previous hazard mitigation actions that the 2012 regional hazard mitigation plan indicated were relevant for the Town of Becket. The relevancy of each action today is defined. The current mitigation action list represents the present and future need for Becket. In addition, the public engagement process that included the development of the Core Team and the Community Resilience Building Workshop led to identification of mitigation actions that the community supports. The new mitigation actions are substantially more detailed, leading the Town toward grant applications and implementation.

*D3. Was the plan revised to reflect changes in priorities?
(Requirement §201.6(d)(3))*

The plan was revised to reflect the priorities of only the Town of Becket, which is a substantial change from the previous regional plan. The goal statements were revised slightly, and the list of mitigation actions was substantially expanded. Most significantly, the current plan represents the Town's keen

Town of Becket Hazard Mitigation Plan Update

interest in mitigating the risk of climate change and its impact on all hazards. The Town of Becket has prioritized green solutions and environmental protection, flood mitigation for infrastructure, and the integration of hazard mitigation into government planning and regulations.

Authority and Assurances

The Town of Becket will continue to comply with all applicable Federal laws and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 201.6. It will amend its plan whenever necessary to reflect changes in Town, State or Federal laws and regulations, as required in 44 CFR 201.6.

The Core Team recognizes the following FEMA publications:

- *Local Mitigation Planning Handbook* (March 2013)
- *Local Mitigation Plan Review Guide* (October 2011)
- *Demonstrating Good Practices Within Local Hazard Mitigation Plans* (January 2017, FEMA Region 1)

Plan Adoption

E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

The Town of Becket will adopt the plan when it has received “approved-pending adoption” status from the Federal Emergency Management Agency. The Certificate of Adoption is included on page 4.

Document Overview

Below is a summary of the Hazard Mitigation Plan chapters, including appendices. The FEMA guidelines and requirements for each portion of this Plan are included in their respective chapters. The planning process closely adhered to FEMA guidelines and to the intent of those guidelines.

Chapter 2: Planning Area Profile

The Planning Area Profile chapter describes the Town of Becket completely, including geography, the built environment, the local economy, and utilities.

Chapter 3: Planning Process

The Planning Process chapter documents the methods and approach of the hazard mitigation planning process. The chapter summarizes the Core Team meetings, the public outreach process (including public meetings), and the Public Preparedness Survey. This chapter guides the reader through the process of generating this Plan and reflects its open and inclusive public involvement process.

Town of Becket Hazard Mitigation Plan Update

Chapter 4: Risk Assessment

The Risk Assessment identifies the natural hazard risks to the Town of Becket and its citizens. The risk assessment looks at current and future vulnerabilities based on development of structures and infrastructure. Included in this chapter is a list of critical facilities identified by the Core Team.

Chapter 5: Capability Assessment

The Capability Assessment looks at the Town's ability to mitigate risk prior to and following disaster.

Chapter 6: Mitigation Strategy

This chapter provides a blueprint for reducing losses identified in the Risk Assessment. The chapter presents the overall hazard mitigation goals and identifies mitigation actions in priority order. Where applicable, funding sources are identified, as are responsible Town departments and potential partners.

Chapter 7: Keeping the Plan Current

"Keeping the Plan Current" establishes a system and mechanism for periodically monitoring, evaluating, and updating the Hazard Mitigation Plan. It also includes a plan for continuing public outreach and monitoring the implementation of the identified mitigation actions.

Appendices

The Appendices includes documentation regarding the planning process, such as Core Team and public meeting presentations and the Public Preparedness Survey results. In addition, resources supporting each chapter are included.

Chapter 2. Town of Becket Profile

The Town of Becket is a rural, upland community located amidst the Berkshire Hills of southwestern Massachusetts. It is a community rich in history and the arts, offering a small-town atmosphere and pastoral landscape. Located in Eastern Berkshire County, it is bordered by seven towns: Washington and Middlefield to the north, Otis to the south, Tyringham and Lee to the west, and Chester and Blandford to the east. It lies approximately 19 miles southwest of Pittsfield and 39 miles northwest of Springfield. Primary access to the town is via Route 20 from the east and west and Route 8 from the north and south. At nearly 48 square miles, Becket is among the largest communities in the state by land area. The map below shows the location of Becket in the Northeast, and the map below that shows the local boundaries of Becket.

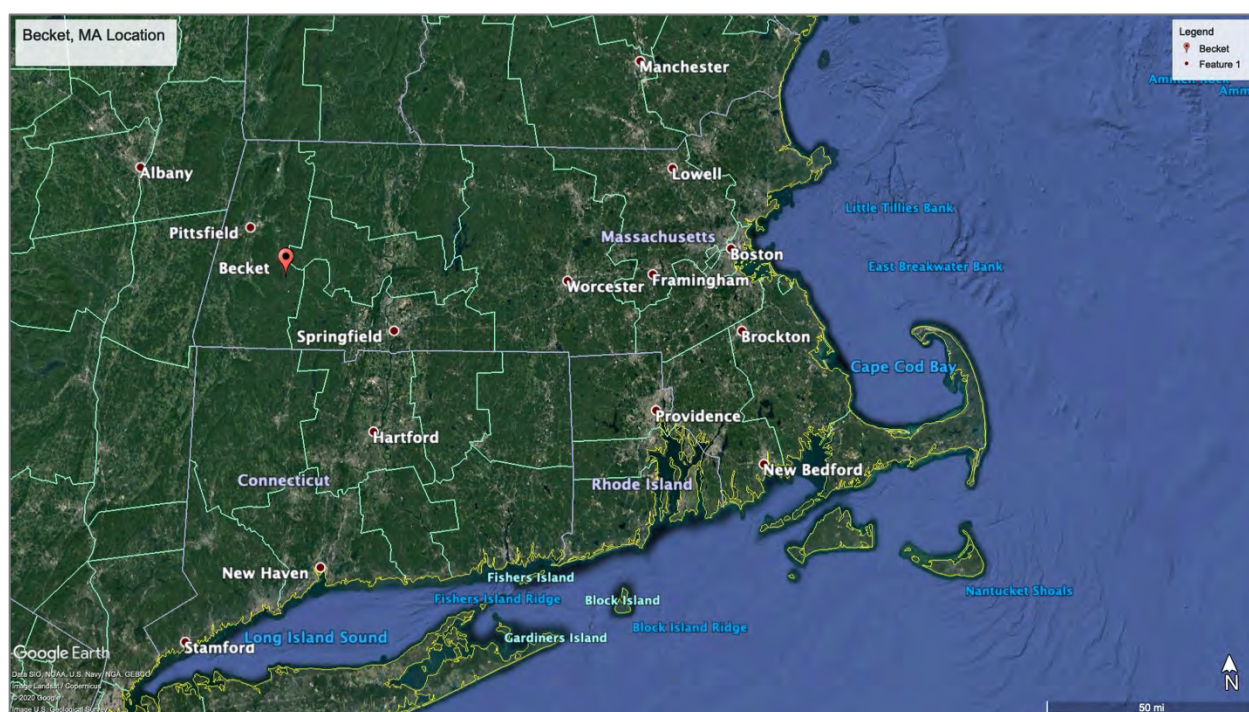


Figure 1. Becket, MA Location

The Town of Becket was established in 1765, having begun as Plantation Number 4. The town was originally laid out in 1735 along with three other towns along the wilderness trail that connected the lower Housatonic Valley with the Connecticut Valley and Boston. The intention was to develop the wilderness that bordered the trail, making travel safer.

In the first settlement effort, 63 home lots were laid "in a compact and defensible form," as the documents of the time said. Population growth was slow and steady, despite the absence of new, large employers. In 1776, there were 414 residents; in 1900, 994 residents; and the current year-round

Town of Becket Hazard Mitigation Plan Update

population is estimated at 1,856.⁸ The town has experienced stable growth in population over the last few decades, gaining close to 15 people per year since 1980, and is currently at its highest population count. Today, Becket remains primarily residential, and is not generally considered a destination for neighboring communities. The Town belongs to the Central Berkshire Regional School District. There is a local elementary school (Becket Washington) in North Becket, while the regional middle and high schools (Nessacus and Wahconah) are in Dalton.

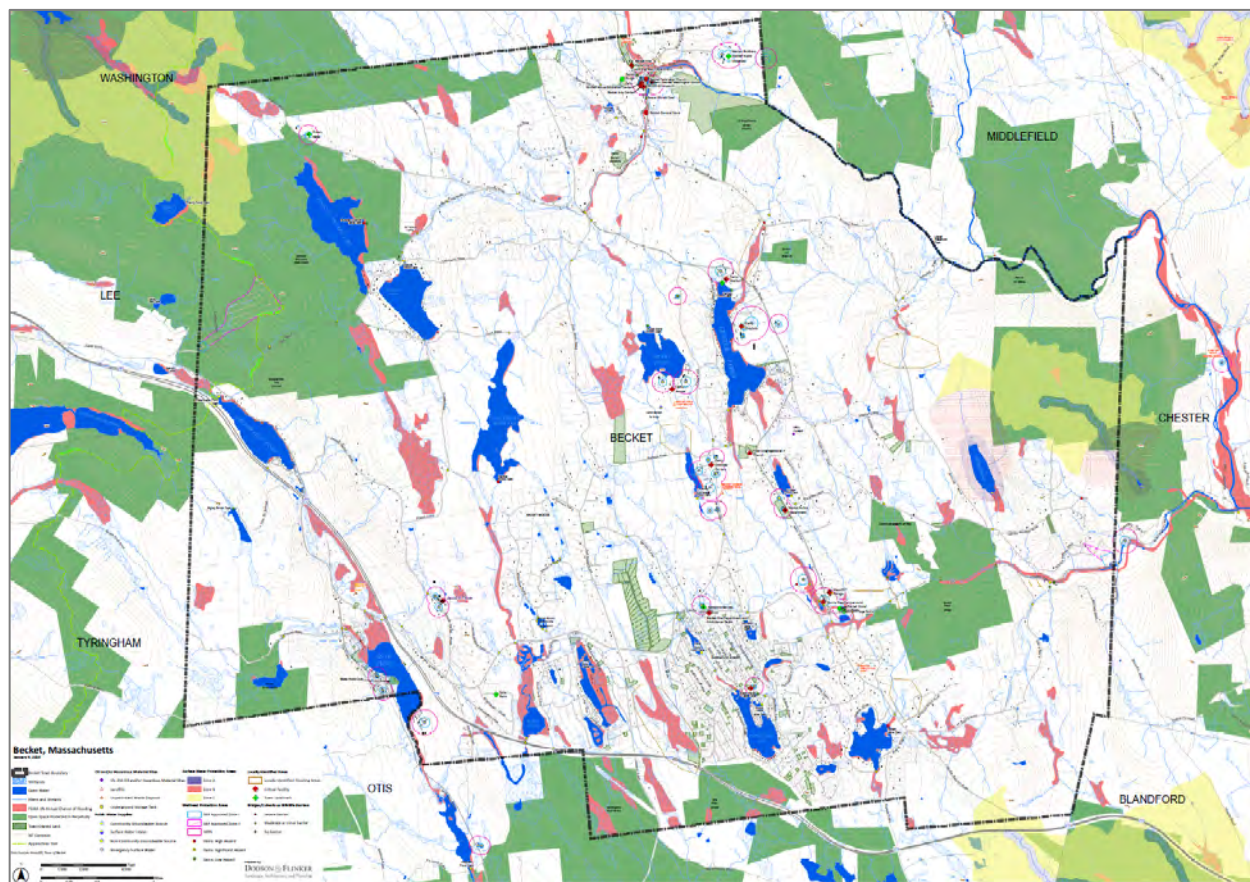


Figure 2. Becket Base map

Becket is a community marked by time. The land was once harvested for timber, and farming has returned to a prime natural state, except for now numerous houses built by those seeking solace in the woods. The town's peace and pride can be seen in the old stones and rich history of its buildings, such as the Mullen House. Another major attraction is the internationally renowned Jacob's Pillow Dance Festival and School. "The Pillow" is a treasured 220-acre National Historic Landmark, a recipient of the prestigious National Medal of Arts, and home to America's longest-running international dance festival.

⁸ U.S. Census Bureau. (2018.) "2014-2018 ACS 5-year Estimates." <https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2018/5-year.html>

Town of Becket Hazard Mitigation Plan Update

Becket's terrain consists primarily of rugged hillside and narrow valleys. The hills generally run from north-northwest to south-southeast, with elevations ranging from 2,200 feet (Walling Mountain) to 800 feet (northeast corner near Middlefield). The town's mountainous terrain includes a portion of October Mountain State Forest, the largest contiguous state forest in Massachusetts, through which a section of the Appalachian Trail runs. The headwaters of three different watersheds lie within its borders: the Housatonic, the Farmington, and the Westfield. The town's northeastern border is formed by the Westfield, the only river in Berkshire County designated as a National Wild and Scenic River.

Becket's quality of life corresponds directly to the quantity and quality of its water resources (see Figure 3). The town's numerous wetlands, ponds, and streams are valued sources of recreation, scenic views, and drinking water. Becket has long been beloved by fishermen and was recognized in the 1940s for having one of the five best trout streams in the Berkshires (the West Branch of the Westfield River, known for the brook, brown, and rainbow trout stocked there). Notably, being at the headwaters of its three watersheds gives Becket the opportunity to control its water quality and floodplain areas.

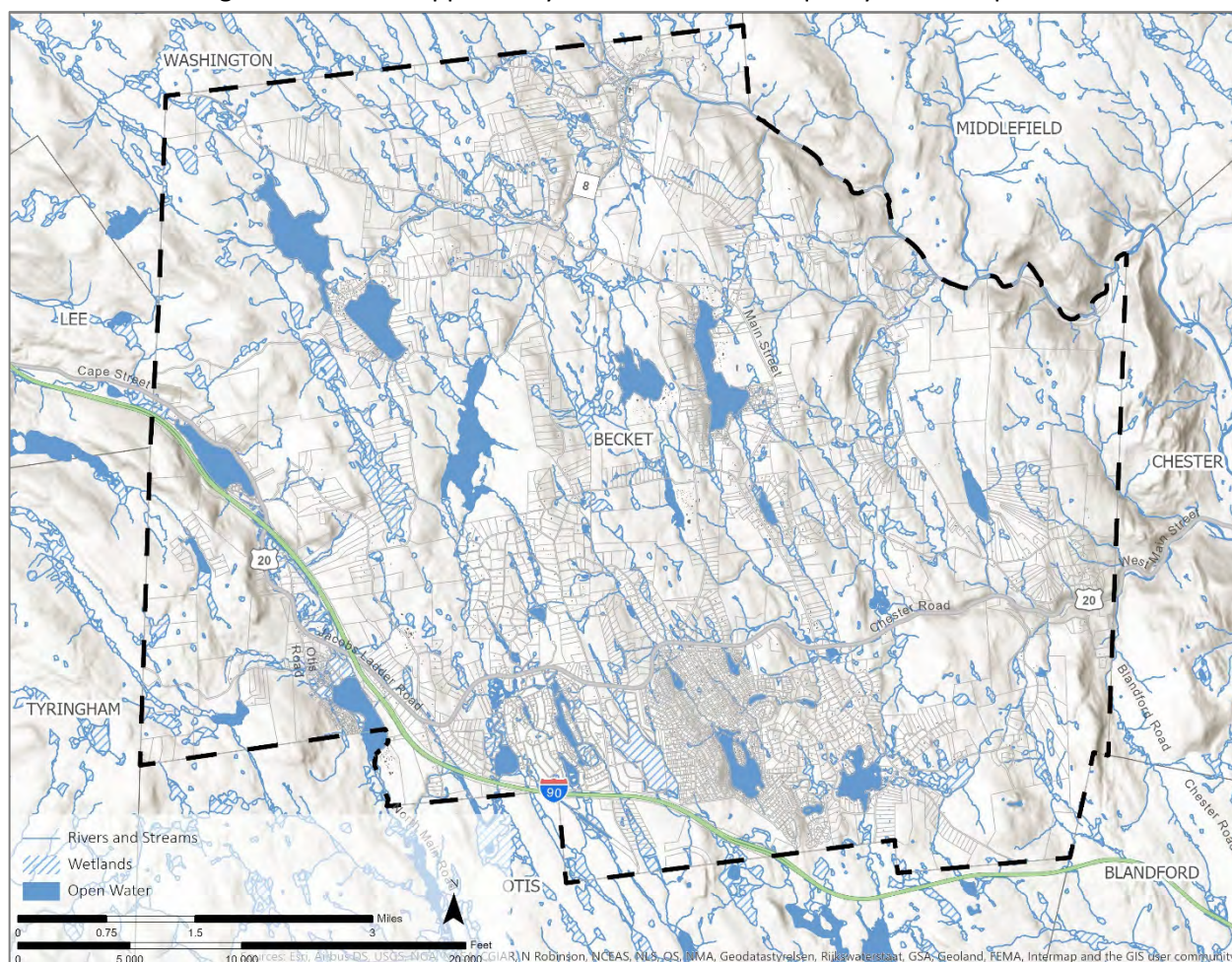


Figure 3. Becket Surface Water

The Town of Becket is governed by an elected three-member Board of Selectmen. The board holds the

Town of Becket Hazard Mitigation Plan Update

authority and responsibility to establish the annual town budget, pass bylaws, and take other major actions affecting Town operations. Every registered voter may attend, speak, make parliamentary motions, and vote on matters that come before Town Meetings. The Town Administrator, appointed by the Selectmen, carries out the day-to-day governing functions of the Town and directs the activities of Town departments, commissions, boards, and other offices under the jurisdiction of the Board of Selectmen.

Population and Housing

According to the latest estimates by the U.S. Census Bureau (2018), Becket's total population is 1,859, or approximately 38 people per square mile. This represents a 4.3% growth rate since the 2010 Census, which is less than the state average growth rate of 5.4%.

The total number of households in Becket has also slowly increased over the past several decades, from 692 in 2000 to 735 in 2010. In 2018, there were an estimated 811 year-round housing units, with 2.3 people per household. Becket has a significant seasonal population; an estimated 980 units are considered vacant and/or seasonal housing. This amounts to nearly 55% of the entire housing stock. The median household income in Becket increased from \$42,031 in 2010 to \$74,659 in 2018.

Figure 4 provides some additional demographic and housing statistics for Becket as reported by the U.S. Census Bureau. As can be seen, Becket has a fairly high percentage of residents over age 65 (21%). Also notable is the high percentage of owner-occupied housing units (92.4%), which is significantly higher than the statewide average of 62%.

Demographic Statistics
• Median age is 51.8 • 4.5% are under age 5
• 20.9% are over age 65 • Average family size is 2.70
• 13.7% have a disability (25.5% of those over age 65) • 97.5% have health insurance coverage • 69.7% are in the labor force • 4.3% are unemployed • Median household income is \$74,659
• 4.5% are below the poverty level
Housing Statistics
• Number of housing units = 1,791 • Median value = \$260,000
• Average household size = 2.29
• 92.4% of year-round units are owner-occupied

Town of Becket Hazard Mitigation Plan Update

- 7.6% of year-round units are renter-occupied
- 38.9% of units were built earlier than 1970

Figure 4. Becket Characteristics from U.S. Census Bureau⁹

Infrastructure and Public Facilities

Transportation System

Becket's transportation infrastructure includes more than 158 miles of paved public roads. Major roadways, as shown in Figure 6, provide access to the surrounding communities and highway systems, offering regional transportation access and mobility.

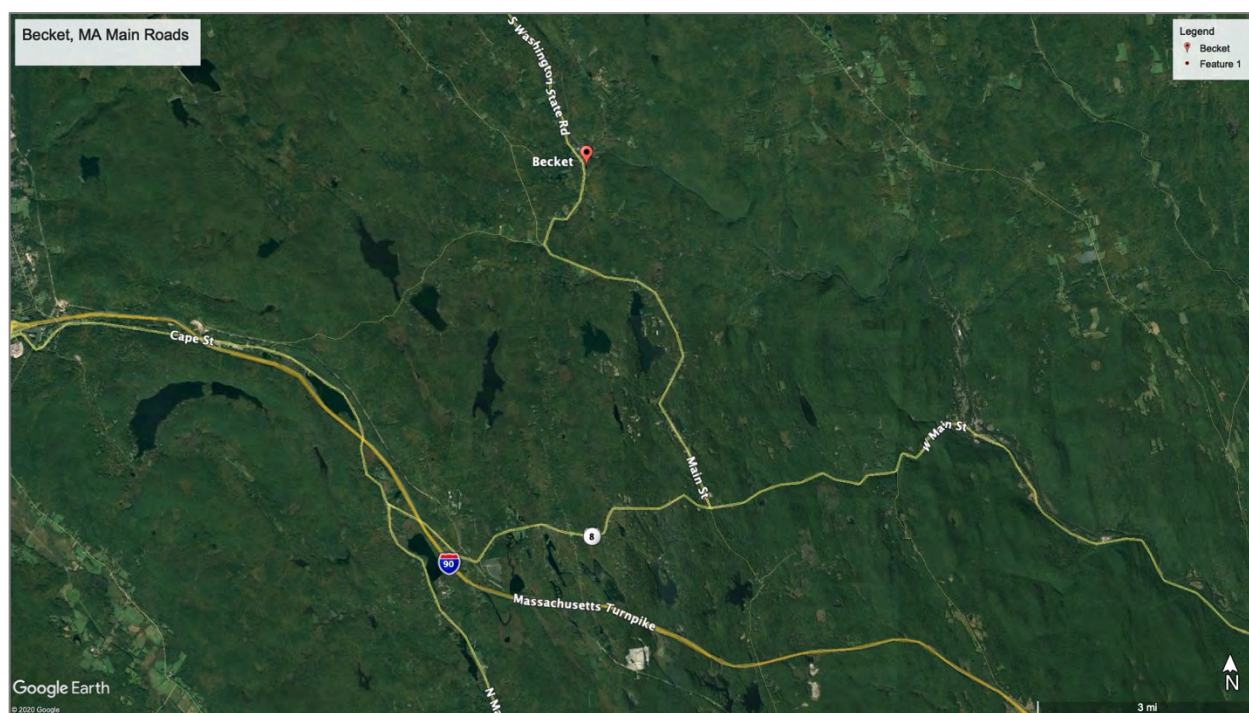


Figure 5. Major Roads in Becket

Currently, the Town of Becket maintains about a third of existing roadways in the town (56 road miles), while MassDOT is responsible for approximately 32 miles. Many of these are the most heavily used roadways, particularly arterial roads that connect Becket with neighboring communities. The remainder of roads in the town are privately owned, including those controlled by homeowner or development associations that take responsibility for maintaining roads within their subdivisions (for example, the

⁹ U.S. Census Bureau. (2018.) "2014-2018 ACS 5-year Estimates." <https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2018/5-year.html>

Town of Becket Hazard Mitigation Plan Update

Sherwood Forest Road District), or they are “unimproved” roadways that access few or no homes or businesses (for example, old logging roads).¹⁰

The principal routes of travel in and out of Becket are Routes 8 and 20. State Route 8 crosses Becket’s boundary near West Becket, where it joins US Route 20. Routes 8 and 20 are the same road between West Becket and Bonny Rigg Corners, where Route 8 turns north and runs through Becket Center and the Village before crossing the northern town boundary and into Washington. Route 20 runs east-west through Becket, connecting it to the neighboring towns of Chester and Lee. The Massachusetts Turnpike travels 6.8 miles of highway through the southwestern corner of town, but as of yet has no exit in Becket.

Route 20 is also part of the Jacob's Ladder Trail, a state-designated scenic byway extending 35 miles between the towns of Lee to the west, through Becket, ending in Russell to the east. The Jacob’s Ladder Trail Scenic Byway, Inc. is a non-profit organization that maintains its natural beauty and historic character. Aside from this route, the town has not designated any roads as Scenic Roads, although many would qualify.



Figure 6. The eastern gateway to Jacob's Ladder Trail

There are no bus lines or mass transit available to residents of Becket, nor are there any designated bikeways. Proximity to well-maintained state highways is crucial for year-round residents, as most commute to outlying areas for employment. Residents commuting to the north travel on Route 8 or Washington Mountain Road, and those commuting east or west use Route 20. For seasonal residents, the opposite is often true; these residents value distance from the major highways of town.

The Boston-Albany Railroad, the busiest freight line in Massachusetts, runs along the northern border of town, but does not stop in Becket.

Bridges and Culverts

According to MassDOT’s database,¹¹ there are 50 State- or municipally-owned bridges and culverts in Becket. (Note that structures under Federal or private ownership are not contained in the database, nor are minor non-highway structures such as pedestrian and bicycle overpasses.)

MassDOT’s database includes 26 bridges with spans greater than 20 feet in Becket. These are categorized as National Bridge Inventory (NBI) structures and inspected by MassDOT on a biannual basis. According to records, one bridge is currently classified as “structurally deficient.” This bridge was built in 1939 and is on Quarry Road as it crosses Cushman Brook, but is not considered to be in the

¹⁰ Berkshire Regional Planning Commission. (2020). *2020 Berkshire County Regional Transportation Plan*. http://berkshireplanning.org/images/uploads/initiatives/2020_BERKSHIRE_RTP_-_FINAL_-_Reduced_Size.pdf

¹¹ Massachusetts Department of Transportation Highway Division. “Roads/Bridges.” <https://gis.massdot.state.ma.us/arcgis/rest/services/Roads/Bridges/MapServer>

Town of Becket Hazard Mitigation Plan Update

floodplain. A replacement bridge for this site has been programmed by the Berkshire Metropolitan Planning Organization (MPO) for 2024. MassDOT's database also includes 17 short span bridges (with spans between 10 and 20 feet) and seven culverts with spans of 4 to 10 feet, though this inventory is considered incomplete and an update effort is underway.

A series of historic keystone arch bridges are located in Becket along the Westfield River. Built in 1830, these granite keystone bridges were the first keystone arch railroad bridges built in America. They are wholly dry laid, and range in height up to 70 feet. The arches bypassed in the line relocation of 1912 have stood for more than 100 years with no maintenance whatsoever. Figure 6 illustrates the location of bridges and culverts throughout the planning area.

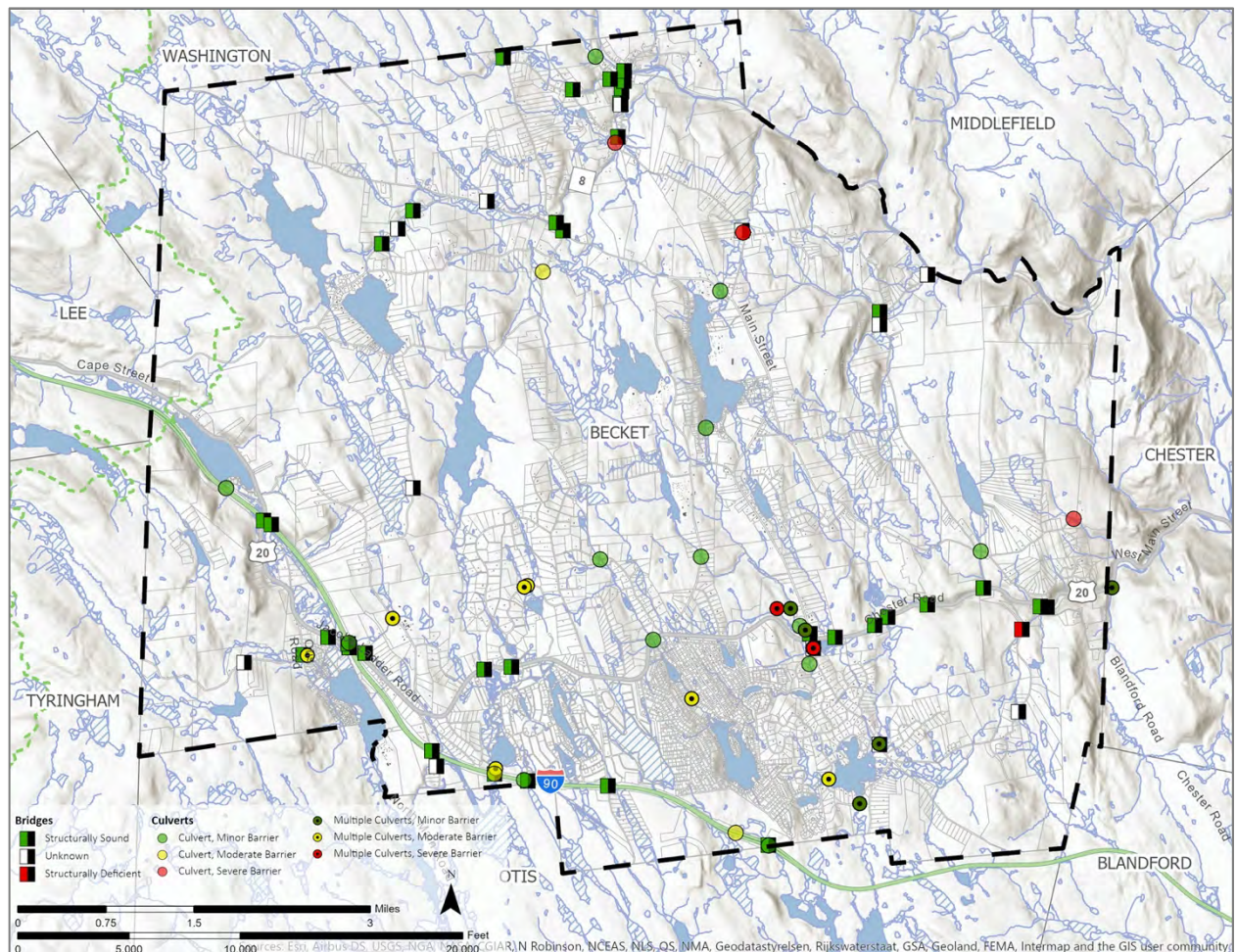


Figure 6. Bridges and Culverts

Water Supply Systems

Residents, businesses, and institutions in Becket are supplied by private groundwater sources. There are 31 public drinking water sources in the town. These include the elementary school, the town hall, restaurants, Jacob's Pillow, and various camps. In addition, three watershed areas have been designated by the State as Outstanding Resource Waters. The location of the public drinking water supplies and other important water sources are illustrated on the water resources map provided in Figure 3.

Town of Becket Hazard Mitigation Plan Update

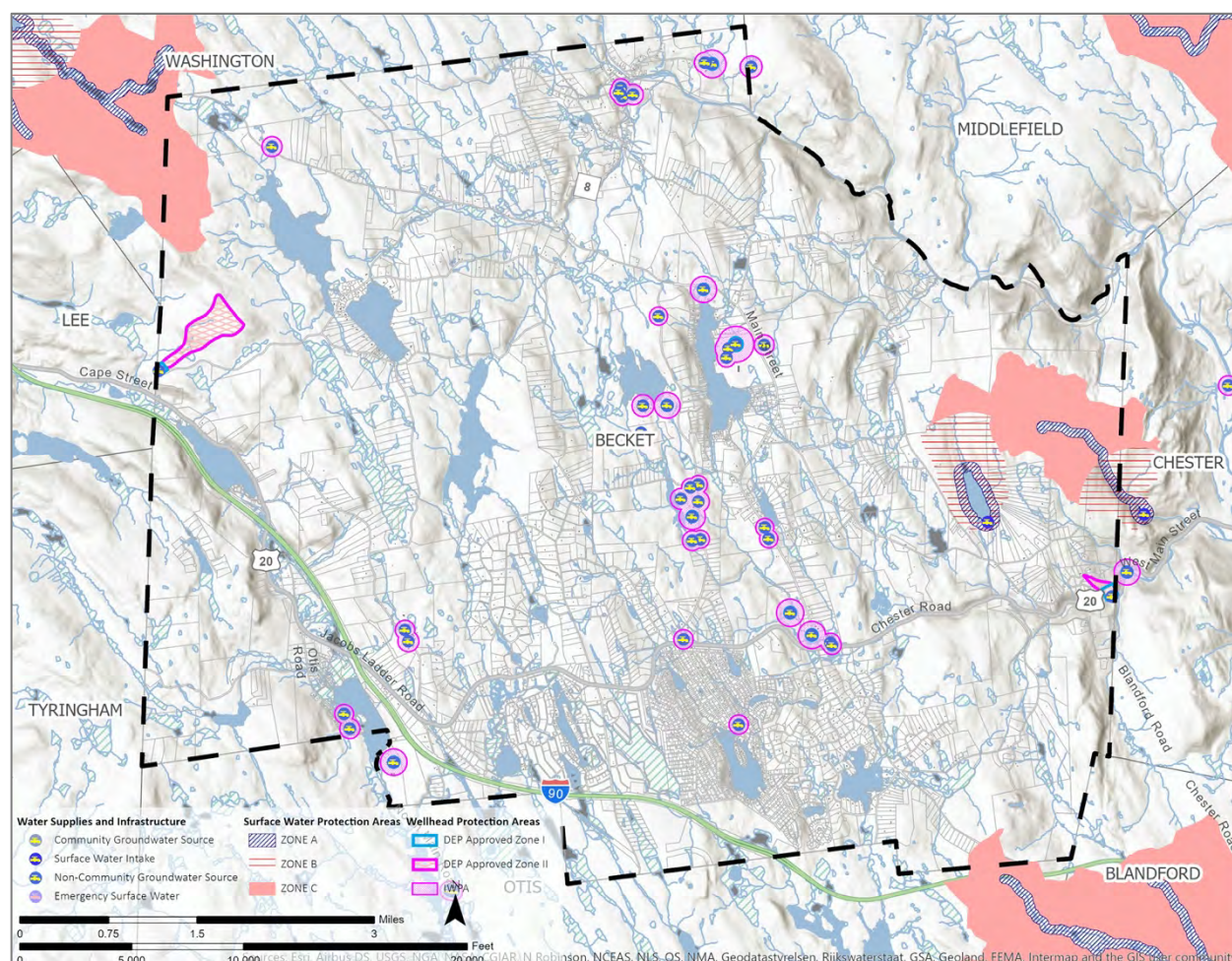


Figure 7. Becket's Water Supplies and Infrastructure

Wastewater Systems

All residences and businesses in Becket dispose of sewage onsite. All are individual systems, with the exception of the wastewater plant that was constructed to serve the two YMCA camps, Chimney Corners and Camp Becket. While access to water and the ability for a site to handle septic effluent have not prevented large tracts of land from being subdivided, it has prevented many of the subdivided lots from being developed. This has not always been true, as many of the small lots throughout town had septic systems placed on them (which have, in more recent years, been failing).

Public Facilities

There are many public facilities in Becket that provide important services to residents and businesses across the community. Some of the town's public facilities and other community assets are shown on the map provided in Figure 8, and those considered to be most critical by the Town of Becket are identified in Chapter 4: Risk and Vulnerability Assessment (see Critical Facilities section).

Town of Becket Hazard Mitigation Plan Update

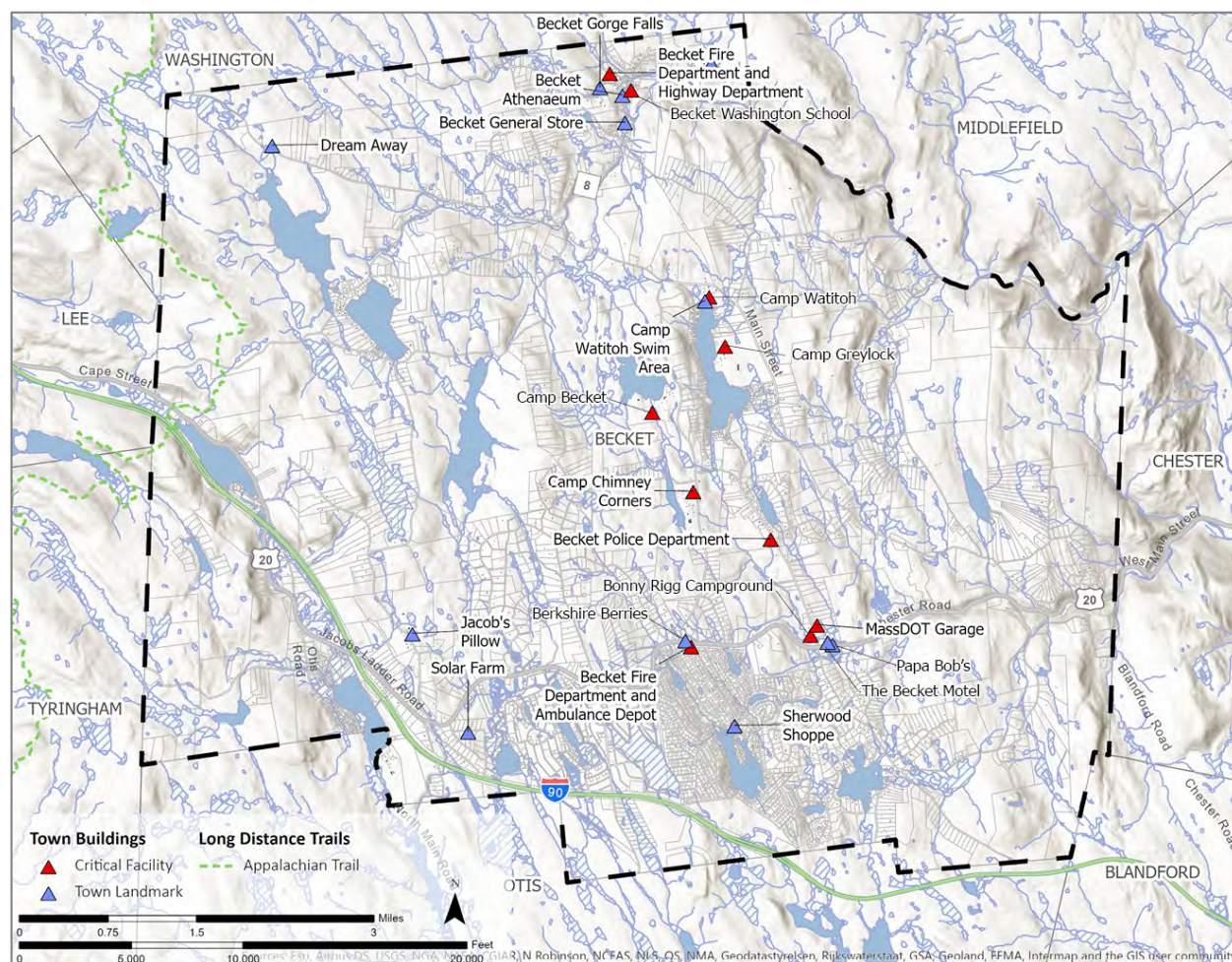


Figure 8. Becket Public Facilities

Land Use

Becket's land use and development patterns are driven in part by its rugged landscape. Dominant landforms in the town are steep, bedrock mountain ridges which run northwest-southeast through town. The valleys between these ridges are dominated by rich wetland areas serving as headwaters for the many streams which flow both north and south through the valleys. This topography, coupled with a lack of major transportation sources, has been cited as preventing more industry from locating in the Town. Figure 9 shows the existing land use and land cover in Becket.

The predominant land uses in Becket are forests (87.3%), wetlands and water (3.8%), and residential (2.9 %).¹² The extensive forestlands provide the rural and unspoiled atmosphere that residents and visitors alike cherish, in addition to large tracts of land for wildlife habitat. Aside from wetlands and water bodies, residential development is the next largest land-use category. There is very little

¹² MassGIS, 2010.

Town of Becket Hazard Mitigation Plan Update

commercial development in Becket, and what businesses are located here are small, family-owned enterprises. Thus, the vast majority of Becket's year-round residents commute to work in nearby towns.

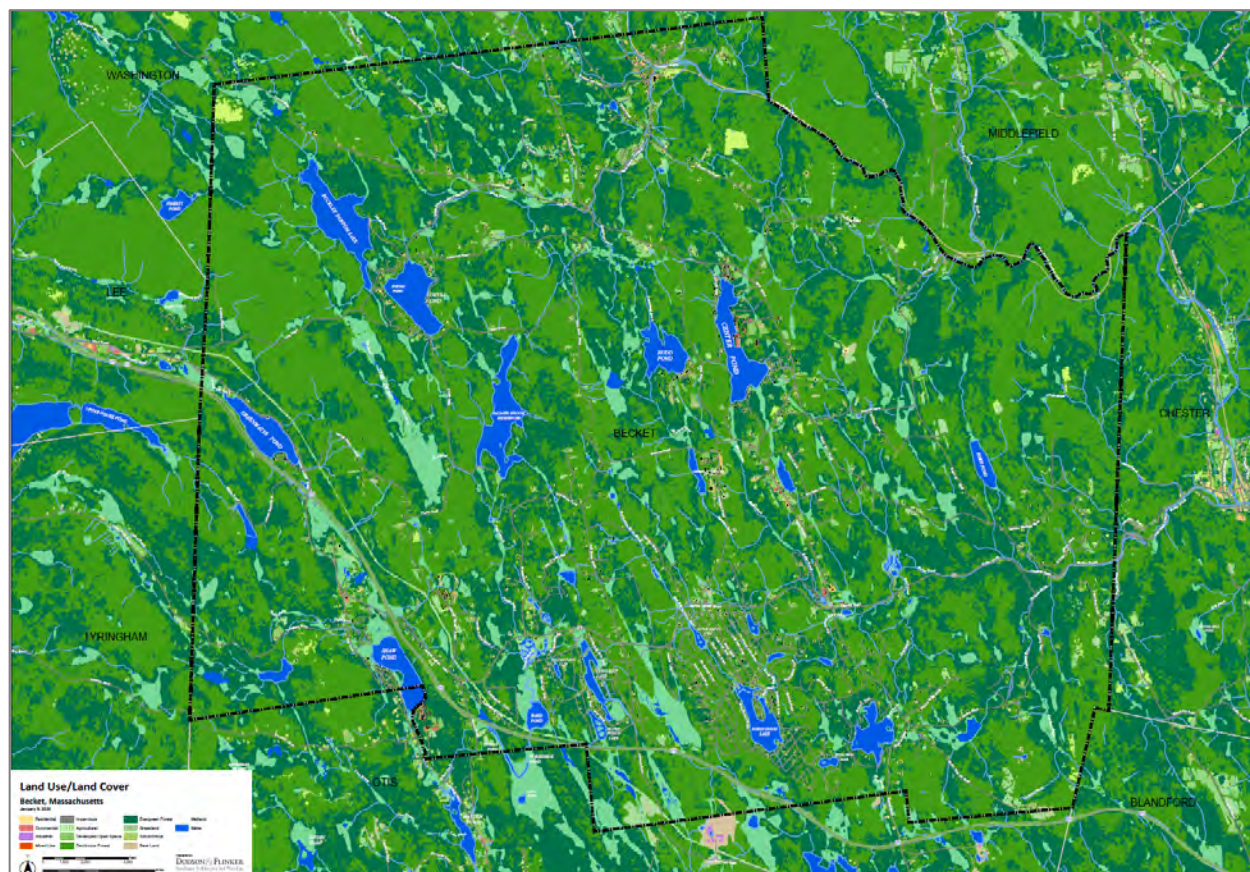


Figure 9. Becket Land Use Map

There is very little agricultural land in Becket, as the soils, steep slope, and shallowness to bedrock inhibit most agricultural activities. The town's limited agricultural lands consist of farm fields, corrals, and farmyards scattered across the town. There are no traditional agricultural operations of significant size, but there are several small but important operations working off the land: several maple sugar-producing operations in the town; Canterbury Farm is a plant nursery; Neil Toomey owns a tree farm; Sunny Bank Farm is a horse riding stable; and Berkshire Berries produces jam from blueberries grown on the property.

Most of the residential development in Becket is concentrated in three village centers and two large-scale subdivisions. North Becket, Becket Center, and West Becket are the town's village centers; Sherwood Forest and Sherwood Greens are the two subdivisions located around Robin Hood Lake and Longbow Lake, respectively. Outside of these areas, development is scattered across the town, mostly consisting of single-family homes on lots greater than two acres and located along existing roadways. Becket has several areas designated as National Historic Districts, including North Becket Village, which includes the Mullen House and Becket Arts Center. Other National Historic Districts include the

Town of Becket Hazard Mitigation Plan Update

Middlefield-Becket Stone Arch Railroad Bridge District and the Becket Center Rural Historic District, the first rural historic district designation in the state.

A significant portion of Becket is owned by the Commonwealth of Massachusetts and includes state forests and Wildlife Management Areas (WMAs). Per the Town's Open Space and Recreation Plan, State-owned lands total 3,910 acres, or 13% of Becket's total land area. The largest of these forests, the October Mountain Forest, spans four adjacent communities and is the largest area under single ownership in the town of Becket. The Becket Land Trust owns and manages the Becket Historic Quarry and Forest, in the southwest corner of the town, for public recreation. Figure 10 shows the location of Becket's permanently protected open-space areas in addition to Town-owned lands.

Becket is fortunate in that its rural landscape supports five overnight camps and one campground. These entities provide an opportunity for hundreds of people to come and enjoy the great outdoors, while providing employment and customers to local businesses. The camps and campground own well over a thousand acres between them. Maintaining their lands in an undeveloped state contributes to the rural and wilderness ambiance of the town.

Town of Becket Hazard Mitigation Plan Update

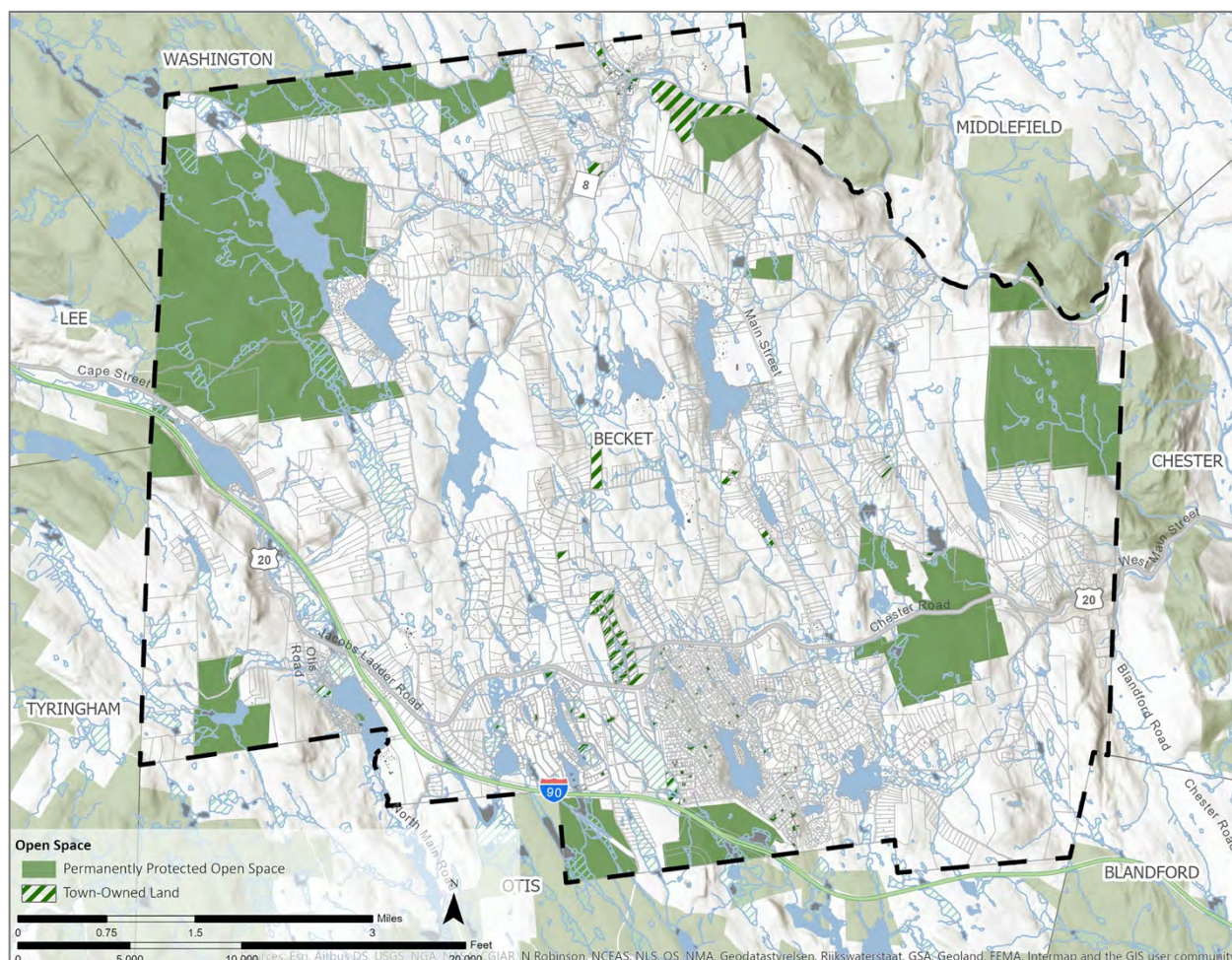


Figure 10. Becket's Open Space

Future Development

Becket has experienced slow but steady population growth, a trend that is expected to continue with generally limited patterns of future land development. The entire Town constitutes a single residential/agricultural zoning district that has a minimum lot size of two acres for single-family dwellings and three acres for two-family dwellings. More intensive residential development and other uses, including any commercial or industrial use of land, are only allowed under a special permit review process. Also, as described above, the town's steep slopes and wetlands limit developable lands to glaciated valleys, which are predominantly narrow and characterized by large bedrock outcroppings with medium-sized cobble boulders lining stream bottoms and banks.

Two previous studies on the Town's maximum build-out concluded that it is still possible for Becket to accommodate thousands more residential units, based primarily on lands available for development and the zoning controls in place at the time of the studies (1993 and 2000). While it is unlikely that development to this extent will occur, it is likely the town will see continue to see both permanent and

Town of Becket Hazard Mitigation Plan Update

second-home construction increase, as people come seeking the peace and quiet of Becket's beautiful landscape. Intense development, such as that indicated as possible in the build-out studies, would compromise the ecological integrity and diversity of this landscape.

Lastly, as noted in Cost of Community Services studies conducted for Berkshire County and across the country, residential development is considered a net financial loss to the town, while undeveloped land is a net financial gain for to the town. This is the case for many communities, as taxes from industrial/commercial and agricultural/woodlands subsidize residential uses. This financial reality is true for Becket as well, despite the fact that more than half the residential properties in the Town are seasonal, and thus place less of a strain on services than year-round residences.

Town of Becket Hazard Mitigation Plan Update

Chapter 3. Planning Process

*A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?
(Requirement §201.6(c)(1))*

The purpose of the hazard mitigation planning process is to create a Town of Becket Hazard Mitigation Plan Update that meets all the requirements of both the Massachusetts Department of Emergency Management and Federal Emergency Management Agency (FEMA).

The planning process was developed in full compliance with current FEMA planning requirements, per the following rules and regulations:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended by the Disaster Mitigation Act of 2000
- Code of Federal Regulations – Title 44, Chapter 1, Part 201 (§201.6: Local Mitigation Plans)
- Federal Emergency Management Agency *Local Mitigation Plan Review Guide* (dated October 1, 2011)

In addition, the plan was prepared with the suggestions found in the *Demonstrating Good Practices Within Local Hazard Mitigation Plans*, FEMA Region 1, January 2017.



Figure 3 Core Team members identifying high hazard areas and critical facilities.

The planning process to develop this updated mitigation plan took place in conjunction with the Town's Massachusetts Municipal Vulnerability Preparedness Program (MVP). Efforts were made throughout the mitigation planning process to align the update with MVP. Meredyth Babcock, resident and MVP Coordinator, has worked as a Projects Coordinator and a volunteer with the Wild & Scenic Westfield River Committee. With approval of the Town Administrator, Ms. Babcock led the MVP and mitigation planning efforts. Ms. Babcock, with support from Town staff and other volunteers, facilitated all activities related to the mitigation plan update, including meeting logistics, data gathering, and public outreach.

Town of Becket Hazard Mitigation Plan Update

Core Team

The Core Team formed to lead the planning process included Town employees as well as local stakeholders. A list of Core Team members is shown in the table below. The Core Team met for a project Kick-off Meeting on November 25, 2019. During this meeting, the consulting team of Dodson & Flinker (MVP provider) and Jamie Caplan Consulting (mitigation planning lead) helped review the goals and objectives of each project and identify next steps for each. The Core Team identified stakeholders to invite to the Community Resilience Building (CRB) workshop scheduled for January 11, 2020. They reviewed the process and purpose of updating the hazard mitigation plan and identified a preliminary list of hazards to review. They also gathered around a map of Becket to point out critical facilities, hazard-prone areas, and areas for potential mitigation actions.

The Core Team met twice following the CRB Workshop to further refine the recommendations into a workable list of mitigation actions. These meetings were held on January 27, 2020 and February 10, 2020. The Core Team did not meet again in person due to the Covid-19 pandemic. They did, however, continue to participate in the development of this plan. The Core Team also participated in the Community Resilience Building Workshop on January 11, 2020 and in the public Listening Session on May 18, 2020.

Organization	First Name	Last Name
Dodson & Flinker	Dillon	Sussman
Jamie Caplan	Jamie	Caplan
Conservation Com.	Meredyth	Babcock
Conservation Commissioner	David	Johnson
Water Quality Specialist	Cindy	Delpapa
Health specialist	Maria	Wallington
Energy Committee	Al	Blake
Forestry specialist	Jim	Peters
Attended Orientation	Ray	Ferrin
Conservation Commissioner	Alison	Dixson
Town Administrator	William J.	Caldwell
Police Chief (EMD)	Kris (Kristopher)	McDonough
Highway Department	Chris	Bouchard
Select Board member(s)	Chris	Swindlehurst

Figure 4 Core team members

Stakeholder Engagement

A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies

Town of Becket Hazard Mitigation Plan Update

that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))

CRB Workshop

The January 11, 2020 Community Resilience Building (CRB) workshop was a day-long event enabling community members chosen as key stakeholders to come together and prioritize resilience and climate adaptation actions. This workshop also allowed neighboring communities and regional agencies to be involved in the mitigation planning process. The CRB methodology is an “anywhere at any scale” format that draws on stakeholders’ wealth of information and experience to foster dialogue about the strengths and vulnerabilities within the Town. Workshop participants interacted at both large and small group levels, using an iterative process to gather input, synthesize ideas across groups, and ultimately develop a set of priority resilience and adaptation actions.

The CRB workshop’s central objectives were to:

- Define top local natural and climate-related hazards of concern
- Identify existing and future strengths and vulnerabilities
- Develop prioritized actions for Becket
- Identify immediate opportunities to collaboratively advance actions to increase resilience

The Core Team worked to invite participants and organize the workshop. The following list represents the people and organizations invited to participate in the CRB Workshop. All workshop invitees are listed; attendees are indicated with an asterisk.

First Name	Last Name	Representing	Present
Meredyth	Babcock	Becket's MVP Point Person (Core Team)	*
Dave	Bacon	Canterbury Farms	
Linda	Bacon	Canterbury Farms	
Al	Blake	Core Team member	*
Chris	Bouchard	Highway Department/Tree Warden (Core Team)	*
Sean	Cahill	Sherwood Forest Rep	*
Colleen	Cahill	Sherwood Forest Rep	
William J.	Caldwell	Town Administrator	*
Dave	Christopolis	Hilltown CDC	
Peter J	Connor	YMCA--Camps and Berkshire Outdoor Center	
Becky	Cushing	Mass Audubon Berkshire Wildlife Sanctuaries	*
Cindy	Delpapa	Core Group member	*
Alison	Dixon	Conservation Commissioner	*
Ray	Ferrin	Ambulance	*
Peter	Flinker	Dodson & Flinker, Facilitator	*
Leanda	Fontaine	Mass Department of Fish and Game	*
Rita	Furlong	Parks and Recreation & USPS worker	

Town of Becket Hazard Mitigation Plan Update

First Name	Last Name	Representing	Present
Allison	Gramolini	Dodson & Flinker, Facilitator	*
Francisca	Heming	MassDOT, District 1	*
Tim	Hickey	Environmental Science professor at BCC	
Ethan	Hoch	Community Member	
Lilly	Hoch	Community Member	
David	Johnson	Core Team member	*
Karen	Karlberg	Jacob's Pillow and community member	*
Gail	Kusek	Historical Commission	
Gale	LaBelle	Board of Health	
Deniss	Lynch	Monterey community member	
Caroline	Massa	Berkshire Regional Planning Commission	*
Kristopher	McDonough	Police Department (Core Team)	*
Purr	McEwen	Yokum Pond area	
Paul	Mikaniewicz	Fire Department	*
Andrew	Myers	Chester community member	
Amy	Permuter	Community Member	*
Jim	Peters	Forestry Specialist	*
Carrieanne	Petrik	MVP Program Western Coordinator	*
Sue	Purser	Sherwood Forest residents	*
Jodi	Shafiroff	Library Administrator	
Dan	Shaw	Dodson & Flinker, Facilitator	*
Dillon	Sussman	Dodson & Flinker, Facilitator	*
Chris	Swindlehurst	Select Board Member (Core Team)	*
Ann Marie	Visconti	Middlefield EMD	*
Carol	Waag	Middlefield Conservation Commission	*
Maria	Wallington	Health specialist	*
Jill	Weinberg	New resident, business owner	*
Jeffrey	Zukowski	Massachusetts Emergency Management Agency	

The outcome of the Workshop was compiled into the *Town of Becket, MVP Summary of Findings, April 28, 2020*, by Dodson & Flinker. This summary includes a tremendous amount of information used to develop this plan. Most significantly, its “Top Recommendations to Improve Resilience to Hazards” was used by the Core Team to develop mitigation actions. The “Concerns and Challenges” as well as “Strengths and Assets” portions of the Summary all contributed to the Capability Assessment and Risk Assessment of this document. The thoroughness of the Summary of Findings enabled a streamlined mitigation planning process.

Public Outreach

A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

Town of Becket Hazard Mitigation Plan Update

The Public Outreach Strategy was designed to involve the public in the mitigation planning process. The purpose of public outreach and stakeholder involvement was to:

- Generate public interest in mitigation planning
- Identify and accommodate special populations
- Solicit public input
- Engage local stakeholders
- Create opportunities for public and local stakeholders to be actively involved in the mitigation planning process

The public outreach strategy included MVP Mini Sessions, Listening Sessions, and an opportunity for the public to review the draft plan. Meredyth Babcock organized a number of public information sessions she called MVP Mini Sessions. These were held at Sherwood Forest, the Athenaeum, and the Becket Town Hall. The MVP Mini Sessions were an opportunity for the public to engage in the project during plan development. Sign-in sheets are included in Appendix B. In addition, the Core Team held a Public Listening Session on May 18, 2020, via Zoom. A flyer for this Listening Session is shown below. It was posted to the Town website (<https://www.townofbecket.org/home/news/hazard-mitigation-mvp-planning-beckets-listening-session-scheduled-may-18th-630pm-830pm>) with additional information (included in Appendix B).

How vulnerable is your street to Flood, Fire and Cotton Tail?
Hazard Mitigation & Municipal Vulnerability Planning
ZOOM in to Becket's Community Listening Session

Planning for
Becket's
Future

Can't listen in?
Everyone can
participate!!

The Listening
Session will be
recorded!
**A draft of the
MVP plan will be
available on
The Town website
From May 8th - 29th**

Questions & comments
Email them to
MVP@townofbecket.org



Listening
Session Monday
May 18th.
6:30 - 8:30 pm.
Zoom in
meeting ID
926 2400 6241
Password
4566230

Poll questions &
chat box
live during Webinar

**Preparing for threats like a 100-year flood or drought,
a tornado, a toxic release from rail or highway traffic, or an extended loss of electric power.**

Figure 5 Listening session flyer

Town of Becket Hazard Mitigation Plan Update

This Listening Session was recorded so residents could listen at their convenience. Those participating in the Listening Session had the opportunity to answer four poll questions and pose questions in the chat box. Following Jamie Caplan’s mitigation planning presentation, Ms. Babcock gave a presentation about the MVP program. The Listening Session attendee list is in the appendix. The following poll questions were asked during the Listening Session on Zoom.

1. How concerned are you about the possibility of yourself or your home or business being impacted by a natural disaster?
 - Concerned
 - **Somewhat Concerned – 64%**
 - Not Concerned
1. How should Becket prepare for climate change and its impact to natural hazards?
 - Climate change is NOT impacting natural hazards.
 - **Storms are increasing in frequency and severity and we should plan accordingly. – 100%**
 - Storm frequency is NOT changing, we should continue on our current path.
2. Do you believe the Town of Becket should...
 - **Protect critical facilities – 79%**
 - **Strengthen emergency services – 71%**
 - **Prevent development in high hazard areas -79%**
3. Have you mitigated risk to your property?
 - **I have removed trees or tree limbs – 92%**
 - **I purchased a generator – 62%**
 - **Purchased flood insurance – 8%**

Review of Draft Plan

After the Core Team reviewed the Draft Plan, the Town made the Plan available to the public for a two-week period in June 2020. The Town distributed a press release announcing the availability of the Plan for public review. The Core Team informed their departments/agencies about the draft Plan. The Town posted the draft Plan on their website and made a hard copy available in the Town Administrator’s Office; comment forms were available in both locations. At the end of the two-week public review period, the Draft plan was amended to reflect public comments and sent to the Massachusetts Emergency Management Agency (MEMA) for review.

Review and Incorporation of Existing Studies

A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))

Town of Becket Hazard Mitigation Plan Update

Several sources were used to develop this plan, including web-based resources, reports, and stakeholder engagement. Throughout the plan, these sources are cited within the text, included as footnotes, and listed in the Resources section of the Appendix. For the purpose of consistency, the Massachusetts Hazard Mitigation and Climate Adaptation Plan (SHMCAP), as well as the Berkshire County Hazard Mitigation Plan were considered. The Town of Becket does not have many formalized plans, but all that were available were considered for the planning process, especially for the Capability Assessment. A theme throughout the planning process was to develop a plan that would easily integrate with the key aspects of other plans in the Town and state. This section reviews details of several key plans and studies and how their content influenced the development of this plan.

Berkshire County Hazard Mitigation Plan, November 5, 2012

The Town of Becket was previously included in the 2012 Berkshire County Hazard Mitigation Plan, developed by the Berkshire Regional Planning Commission (BRPC). This Plan is just for the Town of Becket and reflects a complete re-creation from the 2012 BRPC plan. Details regarding specific changes are included in the Introduction and in each chapter.

Massachusetts Hazard Mitigation and Climate Adaptation Plan, 2018¹³

Consistency with the State plan is not only required, it makes sense. The State Plan was used as a starting point for hazard identification and then for hazard analysis; details are included in the Risk Assessment. Of significance is the classification of natural hazards in terms of climate change interactions, changes in precipitation, rising temperatures, extreme weather, and non-climate influenced hazards.

¹³ Resilient MA Climate Clearinghouse. <http://www.resilientma.org/data/documents>

Chapter 4. Risk and Vulnerability Assessment

The risk assessment includes four parts: natural hazard identification, profile hazards, inventory assets, and estimate losses. The risk assessment is updated according to FEMA local hazard mitigation planning regulations as found in C.F.R. 44 201.6.

Conducting a risk assessment is a way of asking and answering “what if ...” questions. For instance, what if the Town of Becket experiences a hurricane? The risk assessment answers questions regarding history, location, frequency, probability, and impact for each hazard. These answers are used in developing a mitigation strategy. Gathering information for the risk assessment included historical research, conversations with stakeholders, and available hazard mapping. It also included information gathered from the MVP Workshop and the Massachusetts State Hazard Mitigation and Climate Adaptation Plan.¹⁴

Hazard Identification

The first step in the risk assessment was to identify the hazards for study. All of the categories of hazard risks from the previous (2012) regional hazard mitigation plan¹⁵ are included in this update. They were all deemed relevant and are shown in Table 3.

Table 3. Hazard rationale

2012 Regional Hazard Mitigation Plan	Becket Update Rationale
Flood Related Hazards - Flooding - Bridges - Dam Failure - Ice Jams	Flood-related hazards remain a significant concern for Becket. The town has experienced a variety of storm events that have caused localized flood impacts, particularly with regard to flooded roadways caused by inadequate drainage systems, undersized culvert/bridge crossings, and beaver dams. Multiple high-hazard dams are located in Becket and the area has experienced a destructive dam failure in the past.
Atmospheric and Winter Related Hazards - Hurricane / Tropical Storm - Tornadoes - Severe Thunderstorms / High Winds / Hail - Winter Storms (Heavy Snow / Nor'easters / Blizzard / Ice)	Becket has regularly experienced severe weather, extreme winds, and winter-related hazard events, including large storms that have resulted in widespread and long-term power outages and other local impacts. Severe storms are of increasing concern due to climate change and projections for more frequent extreme weather events, some of which are already being observed on a more regular basis with greater intensity (particularly those bringing heavy rainfall).

¹⁴ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

¹⁵ Berkshire County Hazard Mitigation Plan. Berkshire Regional Planning Commission. February 2012.

Town of Becket Hazard Mitigation Plan Update

2012 Regional Hazard Mitigation Plan	Becket Update Rationale
Geologic Hazards - Earthquakes - Landslides	Although not of great concern, earthquake hazard remains a potential risk for the Town to consider in its mitigation planning efforts. Landslides are also of negligible concern, as most events in the region tend to be rock falls with impacts limited to minor disruptions such as temporary road closures. The Town identified landslides as a low risk hazard in the previous regional hazard mitigation plan, and during the Town's MVP workshop landslides only came up in the context of Route 20 in the neighboring town of Chester.
Other Natural Hazards - Wildland Fire / Major Urban Fire - Drought - Beaver Dams - Extreme Temperature	The town has experienced wildfires, droughts, and extreme temperatures events in the past, and they are of increasing concern due to climate change. Beaver dams remain an ongoing and increasing nuisance and hazard problem for the town. Urban fire will not be addressed in this update for Becket since the plan is focused on natural hazards only.

The next step was to review the recently updated Massachusetts State Hazard Mitigation and Climate Adaptation Plan of September 2018. The list of hazards from the State plan are included in Table 2, along with the rationale for including them in the Town of Becket's plan update.

Table 4. Rationale for including hazards listed in the state plan

MA State Plan Hazards	Town of Becket Rationale for Inclusion/Exclusion
Inland Flooding	Flooding is a significant concern to many parts of Becket.
Drought	Drought is a risk to the region.
Landslide	All of Becket is classified as having a low incidence of landslides, and local officials did not identify any local hazard concerns aside from minor rock falls. Based on this information, landslides will not be addressed in the plan update for Becket. This determination is validated by hazard data and mapping provided in the State Plan.
Coastal Flooding	Not applicable to Becket as a non-coastal community.
Coastal Erosion	
Tsunami	
Average/Extreme Temperatures	Becket has experienced extreme temperatures throughout history, including approximately one heat wave per year in the past. Extreme heat events are anticipated to increase in frequency and severity due to climate change.
Wildfires	Wildfires are not considered a significant risk to Becket; however, due to large areas of intermix (where housing and vegetation

Town of Becket Hazard Mitigation Plan Update

MA State Plan Hazards	Town of Becket Rationale for Inclusion/Exclusion
	intermingle) coupled with projected increases in extreme heat and drought conditions, they are certainly possible.
Invasive Species	Identified as a hazard of concern by the MVP Core Team. Climate change is projected to increase the prevalence of invasive species.
Hurricanes/Tropical Storms	Hurricanes and tropical storms continue to be a risk for the region.
Severe Winter Storm/Nor'easter	Severe winter storms are a risk every year.
Tornadoes	Tornadoes continue to be a risk.
Other Severe Weather (including strong wind and extreme precipitation)	Becket has experienced severe storms with high winds and extreme precipitation, including damaging hailstorms. Severe weather is an increasing threat as future storms are projected to occur with more intensity due to climate change.
Earthquake	Becket is considered to have a low risk to earthquakes; however, the consequences of a low-probability event could still result in moderate to significant impacts to the community.
Dam Failure	There are multiple dams located in Becket, including some classified as high or significant hazard. Based the presence of existing dams and a previous destructive dam failure event in 1927, the Town considers itself at risk to future dam failures.

During Becket's MVP Workshop, participants indicated the following top four natural hazards as of biggest concern to the community. These four hazards have already had demonstrated impacts on the town, and as climate change progresses, these hazards are expected to have ever greater consequences for infrastructure and environment, as well as for various societal elements.

- Flooding
- Severe weather (storms in all seasons)
- Ecosystem change
- Average and extreme temperatures

The Massachusetts State Hazard Mitigation and Climate Adaptation Plan grouped hazards according to primary climate change interactions. These categories are also consistent with the Commonwealth's Resilient Massachusetts Climate Change Clearinghouse website.¹⁶ In an effort to ensure consistency with the State Plan and emphasize the impact of climate change on hazards, this Plan used these four categories to group hazards. All hazards identified fit into one of these categories, except for earthquake, which is considered a non-climate-induced hazard, and dam failure, which is a technological, human-caused hazard. The four categories and definitions are defined in Table 3.

¹⁶ Resilient Massachusetts Climate Change Clearinghouse. www.resilientma.org

Town of Becket Hazard Mitigation Plan Update

Table 5. Definitions of climate change interactions

Climate Change Interaction	Definition
1. Changes in Precipitation	Changes in the amount, frequency, and timing of precipitation—including both rainfall and snowfall—are occurring across the globe as temperatures rise and other climate patterns shift in response.
2. Sea Level Rise	Climate change will drive rising sea levels, and rising seas will have wide-ranging impacts on communities, natural resources, and infrastructure along the Commonwealth's 1,519 tidal shoreline miles.
3. Rising Temperatures	Average global temperatures have risen steadily in the last 50 years, and scientists warn that the trend will continue unless greenhouse gas emissions are significantly reduced. According to the U.S. National Oceanographic and Atmospheric Administration (NOAA), the nine warmest years on record all occurred in the last 20 years (2017, 2016, 2015, 2014, 2013, 2010, 2009, 2005, and 1998).
4. Extreme Weather	Climate change is expected to increase extreme weather events across the globe as well as in Massachusetts. There is strong evidence that storms—from heavy downpours and blizzards to tropical cyclones and hurricanes—are becoming more intense and damaging and can lead to devastating impacts for residents across the state.

The final list of hazards for this plan is shown in Table 4, sorted according to climate change interaction.

Table 6. Town of Becket hazards

Primary Climate Change Interactions	Hazards
Changes in Precipitation	Flooding (including culvert issues, ice jams, beaver dams, and other flood-related hazards) Drought
Rising Temperatures	Average/Extreme Temperatures Wildfires Invasive Species
Extreme Weather	Hurricanes/Tropical Storms Severe Winter Storm/Nor'easter (including heavy snow, ice storms, blizzards) Tornadoes Severe Weather (including high winds, hail, extreme precipitation)
Non-climate-influenced Hazards	Earthquake
Technological and Human-caused Hazards	Dam Failure

Town of Becket Hazard Mitigation Plan Update

Hazard Profiles

The next step in the risk assessment process was to develop hazard profiles. These were developed to be consistent with Element B, Hazard Identification and Risk Assessment, from 44 C.F.R. 201.6.

B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

The hazard profiles have been organized by primary climate change interaction and include the following sections: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events and Changes Since the Previous Plan, and Impact on the Community and Vulnerability. Impacts of climate change were added to the end of each hazard section. A description of each of these analysis categories is provided in Table 7. Data for these sections comes from three primary sources: the 2012 Regional Hazard Mitigation Plan, the 2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan, and the MVP planning process and findings. Supplemental data on previous hazard occurrences from NOAA's Storm Events Database and meteorologists at New England Weather Science was also reviewed. Finally, several Town of Becket employees and MVP Core Team members gathered and provided best available data and information in support of the hazard profiles.

Table 7. Categories for hazard analysis

Categories	Definition
Hazard Description	A basic description of each hazard.
Location	Location refers to the geographic areas within the planning area that are affected by the hazard. Some hazards affect the entire planning area universally, while others apply to a specific portion, such as a floodplain or area that is susceptible to wildfires.
Extent	Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described using an established scientific scale or measurement

Town of Becket Hazard Mitigation Plan Update

Categories	Definition
	system. Other descriptions of extent include water depth, wind speed, and duration.
Previous Occurrences	Previous hazard events that have occurred are described. Depending on the nature of the hazard, events listed may have occurred on a local or regional level.
Probability of Future Events and Changes Since the Previous Plan	The likelihood of a future event for each natural hazard and any significant changes to probability since the previous plan are listed.
Impact on the Community and Vulnerability	Described by stakeholders and inferred from data analysis.

Changes in Precipitation

Flooding

Hazard Description

The many streams that traverse Becket are headwaters for three major watersheds in the region: the Housatonic River to the west and south of town, the Westfield River to the east, and the Farmington River to the southeast. Being at the headwaters of these watersheds gives Becket a unique opportunity to control its water quality and floodplain areas.

The Housatonic River is the dominant watershed in Berkshire County and drains 10% of Becket's land toward the west. The river flows in a southerly direction through the county and into Connecticut, where it drains into Long Island Sound. The Farmington River watershed drains approximately 30% toward the south, while the Westfield River watershed drains about 60% of the land toward the north, south, and east. The Farmington and Westfield rivers are tributaries of the Connecticut River which, like the Housatonic, flows through Connecticut before discharging into Long Island Sound. Primary flooding sources in Becket include these river systems in addition to many streams which flow both north and south through the many valleys of the planning area.

Streams are generally swift-flowing through narrow channels, often traveling through steep ravines. The streams within the town are primarily mountain brooks of low order; few streams within the town reach fourth-order magnitude. The streams are characterized by relatively small flows, but the flows can become flashy with heavy, short bursts of rain. Some of the more prominent streams include Shaker Mill Brook, Yokum Brook, Center Pond Brook, Tyne Brook, Palmer Brook, Sparks Brook, Cushman Brook, Hamilton Brook, Walker Brook, and Mountain Pasture Brook.

Town of Becket Hazard Mitigation Plan Update

Becket also has an abundance of lakes and ponds throughout the town. Some of the major water bodies include Greenwater Pond, Upper Goose Pond, Shaw Pond, Palmer Brook Pond, Buckley Dunton Lake, Yukum Pond, Rudd Pond, Center Pond, Robin Hood Lake, and Indian Lake. Much of the town's seasonal housing exists around these lakes.

Storms that include heavy amounts of rain may cause flooding in Becket. There are three types of these storms.

- Continental storms are typically low-pressure systems that can be either slow- or fast-moving. These storms originate from the west and occur throughout the year.
- Coastal storms, also known as nor'easters, usually occur in late summer or early fall, and originate from the south. The most severe coastal storms, hurricanes, occasionally reach Massachusetts and can generate extremely large amounts of rainfall over a short period.
- Thunderstorms form on warm, humid summer days and cause locally significant rainfall, usually over the course of several hours. These storms can form quickly and are more difficult to predict than continental and coastal storms.

Floods in the Town of Becket have occurred in every season of the year. Spring floods are common and are caused by rainfall in combination with snowmelt and/or ice jams. Floods in late summer and fall are usually the result of above-normal precipitation, often associated with coastal storms moving up the Atlantic coastline, with more localized flooding caused by summer thunderstorms. Winter floods result from the occasional thaws and ice jams, particularly in years of heavy snow cover. Flooding may also result from beaver dams, an ongoing battle for the Town (Becket has 14 beaver deceivers in place), or from a structural dam breach or failure, as discussed later in this chapter.

Location

As illustrated in Figure 1, there are approximately 2,600 acres of FEMA-mapped special flood hazard areas in Becket, which is roughly 9% of the town's total acreage. Many of these lands are located along the town's principal streams, including Walker Brook, Palmer Brook, Center Pond Brook, Yokum Brook, and the West Branch of the Westfield River. These areas are regulated under the Town's Floodplain Zoning Overlay, which requires any proposal for building to be reviewed by the Conservation Commission and Planning Board and meet certain floodplain development regulations. Low-lying areas adjacent to the town's many impounded ponds and wetlands are also susceptible to flooding. This includes areas around Center Pond, Rudd Pond, Ward Pond, Shaw Pond, Greenwater Pond, Yokum Pond, Horn Pond, and Buckley-Dunton Reservoir. According to the Open Space and Recreation Plan, the current impoundments were constructed for aesthetic and recreation reasons and were not meant to act as flood control structures.¹⁷

¹⁷ Open Space and Recreation Plan, Town of Becket, 2006. p. 22.

Town of Becket Hazard Mitigation Plan Update

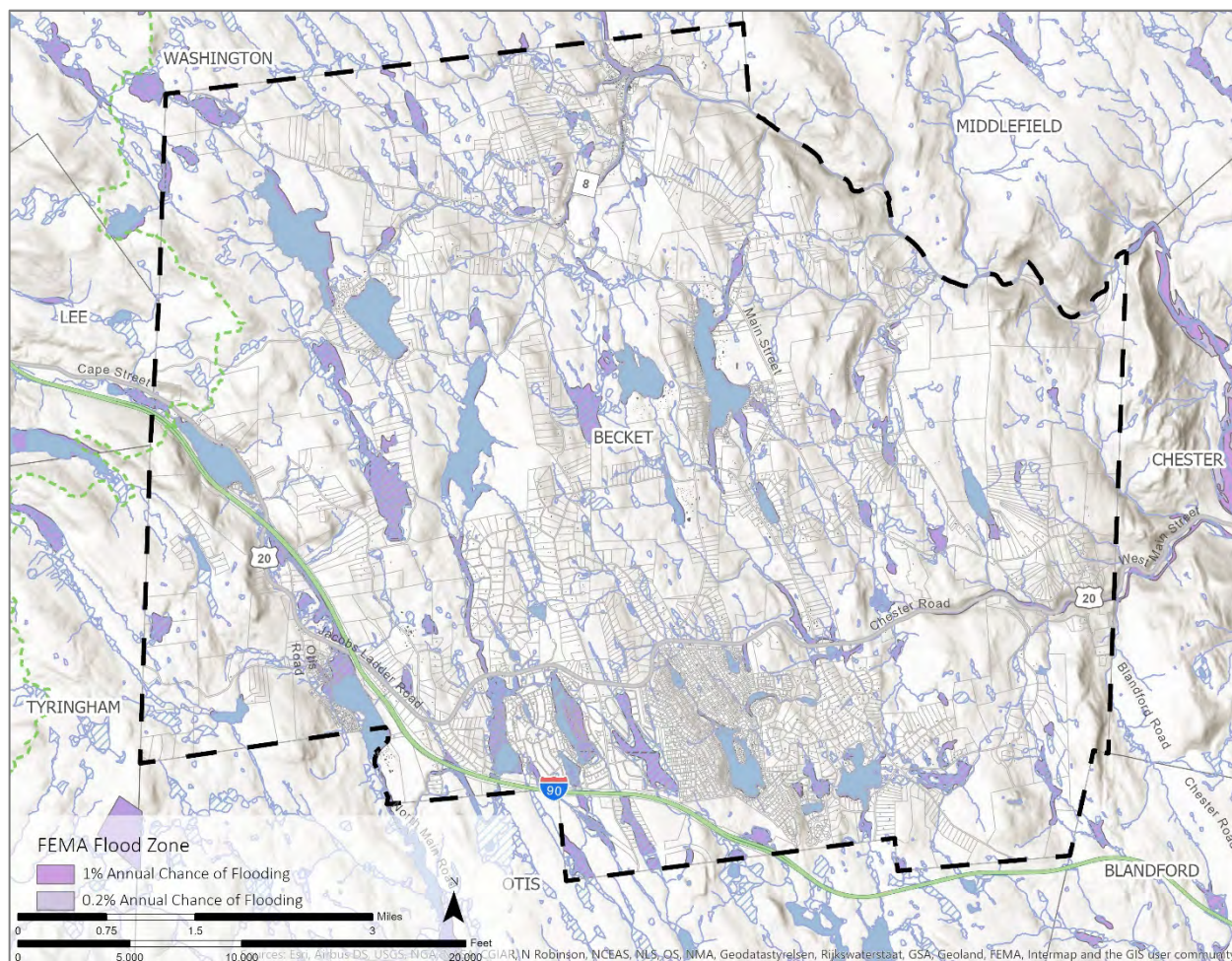


Figure 6. FEMA flood zone map

More specifically, the following flood-prone problem areas were identified through the Town’s MVP and hazard mitigation planning process.

Roads

- Route 20 (multiple locations). Route 20 is the Town’s main route to the east; there are few good alternative routes.
- Route 8 at Center Pond Brook
- Route 8 near Route 20 – An undersized culvert under the roadway occasionally floods, blocking the road through Town and potentially interfering with emergency access.
- Leonhardt Road, which is steep with ledges, is subject to washout, erosion, and flooding.
- Hamilton Road is steep, has an undersized culvert, floods on upstream side, and the inlet has previously filled in.
- YMCA Road, which has beaver activity. Currently there are three beaver deceivers in place.
- Luce Road, which has a culvert that is a severe wildlife barrier. There is only one house on the far side of the culvert.
- McNerney Road to Carter Road

Town of Becket Hazard Mitigation Plan Update

- Although it is a state-owned road for which the Town has no jurisdiction, the Massachusetts Turnpike passes through southern Becket. It can potentially flood from adjacent wetlands in Becket. In the past, improperly managed beaver activity has resulted in roadway flooding.

Bridges/culverts

- Cushman Road bridge (scheduled for a 2024 replacement)
- The culvert on Benton Hill Road at the intersection of Surriner Road needs replacement. The culvert is a high-priority wildlife barrier and the road provides an important transportation connection. The town has applied several times for funding for the replacement but has not obtained funding yet. The estimated project cost is \$400,000.
- Other top priority culverts for replacement include one on Hamilton Road and one on YMCA Road at South Cove Road.

Areas with beaver activity (with potential to flood roads or other infrastructure)

- Behind the Becket motel
- Adjacent to YMCA road west of the First Congregational Church
- North of the Mass Pike between Arrowhead Lane and Old Carriage Lane
- County Road west of Stanley Road
- Near the intersection of Yokum Pond Road and Leonhardt Road
- Bancroft Road near Surriner Road
- Wade Inn Road east of Big Bass Lane
- Bonny Rigg Hill Road near Spark Brook
- Quarry Road near Cushman Brook

Extent

On average, Becket receives 51 inches of rain per year. This is above the U.S. average of 38 inches per year.¹⁸ Becket can expect heavy rainfall from a number of natural hazard events, including severe storms and hurricanes. However, the severity of an inland flood event is typically determined by a combination of several major factors that go beyond precipitation and weather patterns, including stream and river basin topography and physiography, recent soil moisture conditions, the degree of vegetative clearing, and impervious surface. The periodic flooding of lands adjacent to rivers, streams, and other waterbodies (floodplains) is a natural and inevitable occurrence that can be expected to take place based on established recurrence intervals. The recurrence interval of a flood is typically defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude (spatial extent and depths) increases with increasing recurrence interval.

¹⁸ <https://www.bestplaces.net/climate/city/massachusetts/Becket>

Town of Becket Hazard Mitigation Plan Update

Previous Occurrences

According to the State Hazard Mitigation and Climate Adaptation Plan, Berkshire County has had seven federally-declared flood-related disasters since 1954.¹⁹ Many additional flood events have occurred in the region without resulting in a federal disaster declaration. Per NOAA's Storm Events Database, since 1996 Berkshire County has experienced a total of 128 flood events, which have caused an estimated \$1.6 million in property damages. These events include those classified in the database as flood, flash flood, and heavy rain events.

During the 20th century, Becket was impacted by several major flood events. These include events on March 20, 1936, September 23, 1938, January 1, 1949, and August 19, 1955. Of these, the floods of 1949 and 1955 were the most severe. Long-term streamflow records (1913 to present) at the United States Geological Survey (U.S.GS) gaging station on the Housatonic River indicate that both the 1949 and 1955 floods had a recurrence interval of more than 100 years.²⁰

In 1955, Hurricanes Connie and Diane combined to flood many of the communities in the southern and eastern portion of Berkshire County, registering as 100-500-year floods (FEMA 1977-1991). In 1984, a multi-day storm left up to 9 inches of rain throughout the southern Berkshires and 20 inches of rain in localized areas. This was reported as an 80-year flood for most of the area, and higher where the rainfall was greater (U.S.GS, 1989).²¹ Many more recent events, while of smaller magnitude, have resulted in localized impacts for Becket, including roadway flooding/washouts, pond overflows, and property damages associated with the flooding of basements and lower floors of vulnerable structures.

Despite this history of damaging flood events, there have been only seven insured flood losses since 1978 in Becket, totaling \$46,615 in claims paid through the National Flood Insurance Program.²² However, there is also a relatively small policyholder base in the Town, with currently less than 30 federally-backed flood insurance policies, which suggests that a number of previous flood damages in the community resulted in uninsured losses.

Probability of Future Events and Changes Since the Previous Plan

Based on historical data and projected future conditions, flooding remains a likely occurrence in Becket. In addition to a changing climate, which has already increased the frequency of heavy rainfall events,

¹⁹ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-9. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

²⁰ Federal Emergency Management Agency. (1991). *Flood Insurance Study for Town of Becket*, p. 4.

²¹ Berkshire Regional Planning Commission. (2012). *Berkshire County Hazard Mitigation Plan*, p. 27.

²² FEMA. FEMA Community Information System, Accessed March 31, 2020.

Town of Becket Hazard Mitigation Plan Update

aging infrastructure—specifically antiquated bridges and culverts—will continue to increase the probability and magnitude of flooding events. In particular, as precipitation events become more intense and less predictable, the town’s many older and undersized culverts are expected to pose a greater threat of failure and flooding. Also, though the town regularly cleans out culverts, debris continues to be an issue. Major storm events can bring a lot of debris down that can then clog ditches and culverts.

Impact on the Community and Vulnerability

Flooding in Becket will predominantly impact roads, especially at road-stream crossings. During Hurricane Irene, Becket experienced several damaged roads from blown out culverts and road washouts. Fortunately, Becket does not have a high number of flood-prone structures compared to other communities. Structures vulnerable to flooding are mostly limited to those that were built within floodplains and/or close to the town’s extensive wetlands. However, these natural areas also provide the benefit of temporary storage of floodwaters, which helps to reduce water volume and velocity in rivers and streams during storms.

Using GIS data from MassGIS, there are approximately 200 structures on about 115 different parcels in Becket that are within the FEMA 100-year floodplain. Structures range from small outbuildings to the Becket-Washington School, which appears to have a corner within the floodplain. The vast majority of these structures are associated with single-family use. It is important to note that MassGIS FEMA floodplain mapping for Becket was digitized from paper maps and appears to be poorly aligned with other GIS data. This likely creates inaccuracies in the GIS identification of flood-risk structures in Becket. At the same time, since the FEMA flood map was delineated, precipitation in Becket has increased, especially the heaviest storm events. It is therefore possible that the actual 100-year floodplain is more extensive than FEMA flood map shows in some locations.

Based on the GIS analysis, the following structures are of particular concern due to flood risks:

- Buildings (including the Town’s Department of Public Works building), vehicles, and materials storage at the Highway Garage site, which is adjacent to Depot Brook, which feeds into the federally-designated Wild and Scenic Westfield River.
- The Becket-Washington School
- Papa Bob’s
- Bonnie Rigg Camping Club
- Camp Greylock—several structures
- Camp Becket YMCA—several structures
- A cluster of residential structures in North Becket Center
- Several structures along Long Bow Lane
- Several structures around Big Robin Lake
- Several structures on Shawnee Shore Road and nearby
- Structures north of Shaw Pond

Town of Becket Hazard Mitigation Plan Update

The Town's Department of Public Works building/highway garage, located in North Becket Village, is considered the only critical municipal facility located within a FEMA-mapped special flood hazard area (100-year floodplain).

As described above under *Location*, the Becket road system is vulnerable to flooding and potential washouts from a variety of factors, including heavy rain and snowmelt events, ice jams, potential dam failures, and beaver activities. Many of the roads throughout the Town do not have adequate drainage systems to deal with heavy rains, especially the dirt roads. The Town does not maintain all roadways within the town. Route 8, Route 20, and the Massachusetts Turnpike are maintained by MassDOT, and roads within some of the planned subdivision communities are maintained by homeowner associations.

More intense storms that deliver higher volume of precipitation in a single event are expected to put significant pressure on existing dams, culverts, and other drainage infrastructure that were designed to handle smaller storms with more consistent distribution of precipitation.

Impacts of Climate Change

Climate scientists predict that in the next few decades, climate change will increase the frequency and intensity of all storms. According to the latest science and downscaled climate change projection data for Massachusetts, Becket is expected to see nearly four additional days per year with precipitation over one inch by the 2050s, and five additional days by the end of the century.²³

Drought

Hazard Description

Droughts vary widely in duration, severity, and local impact. They may have widespread social and economic significance that require the response of numerous parties, including water suppliers, firefighters, farmers, and residents. Droughts are often defined as periods of deficient precipitation. How this deficiency is experienced depends on factors such as land use change, the existence of dams, and water supply withdrawals or diversions. For example, impervious surfaces associated with development can exacerbate the effects of drought due to decreased groundwater recharge.²⁴

Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area. It is also related to the timing and the effectiveness of the rains (i.e., rainfall intensity, number of rainfall events).

²³ MA Statewide and Major Basins Climate Projections. Guidebook Supplement. March 2018. p. 200.

²⁴ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-38.

Town of Becket Hazard Mitigation Plan Update

Other climatic factors, such as high temperature, high wind, and low relative humidity can significantly aggravate its severity.

The beginning of a drought is difficult to determine. Several weeks, months, or even years may pass before drought conditions become apparent. The first evidence of drought is usually seen in record low levels of rainfall and unusually low soil moisture. The effects of a drought on streamflow and water levels in lakes and reservoirs may not be noticed for several weeks or months. Groundwater levels may not reflect drought conditions for a year or two later. The end of a drought can occur as gradually as it began. Dry periods can last 10 years or more.

Location

Drought is an atmospheric hazard that may impact all of Becket. Typically, agricultural areas and related industries experience the greatest risks due to drought. However, there are few open agricultural lands in town because the soils, steep slopes, and shallowness to bedrock inhibit most agricultural activities. While there are no agricultural operations of significant size in Becket, there are several small working landscapes, including Canterbury Farm, Sunny Bank Farm, Berkshire Berries, and Neil Toomey Tree Farm.

Extent

The severity and extent of droughts are typically classified according to impacts relating to agricultural losses and shortages in drinking water supplies. The U.S. Drought Monitor categorizes drought on a D0-D4 scale, as shown in Table 8.

Table 8. U.S. Drought Monitor²⁵

Classification	Category	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting and growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low; some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells create water emergencies

²⁵ United States Drought Monitor. "Drought Classification."
<https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx>

Town of Becket Hazard Mitigation Plan Update

Previous Occurrences

Massachusetts generally has enough precipitation to support the demands residents and businesses place on water. Periods of drought are not unheard of; Massachusetts has experienced multi-year drought periods in 1879-83, 1908-12, 1929-32, 1939-44, 1961-69, 1980-83, and 2016-2017. Multi-year droughts are identified by analyzing annual and cumulative departures from long-term stream flow. Several less severe droughts occurred in 1999, 2001, 2002, 2007, 2008, 2010, and 2014.

The most severe drought on record in the Northeast was between 1961-69. Water supplies and agriculture were affected because of the severity and duration of the drought. Precipitation was less than average beginning in 1960 in Western Massachusetts. Stream flow had the greatest negative departure during 1965 in the western part of the state, and during this drought, several communities declared water supply emergencies.

Over the past century, six multi-year droughts have affected the Berkshires covering 66 months, or 5.5% of the century. In recent years, droughts have not caused extreme hardships for the Berkshire region, but have tended to lead to restrictions on items such as lawn watering or car washing. During these events, rivers, streams, lakes, and ponds were most affected, as many ran at record low levels during the spring run-off season and there were periods of high fire danger. While soil moisture was well below normal, little to no monetary losses to the agricultural sector were recorded for the region.

Probability of Future Events and Changes Since the Previous Plan

Massachusetts is often considered a “water-rich” state. Under normal conditions, regions across the state receive between 40 and 50 inches of precipitation annually, and the Commonwealth has never received a Presidential Disaster Declaration for a drought-related disaster. However, Massachusetts has and will continue to experience extended periods of dry weather, from single-season to multi-year events.

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in all climatic zones across the northeast, but each drought affects subregions differently. Historically, most droughts in Massachusetts start with dry winters rather than dry summers. However, based on recent climate projections, this trend may shift the probability of future events to summer and fall seasons, particularly for what are anticipated to be more frequent, short-term drought occurrences.

Impact on the Community and Vulnerability

All residents, businesses, and institutions in Becket are supplied by private groundwater sources which rely entirely on precipitation, so longer or more frequent droughts may threaten the community's

Town of Becket Hazard Mitigation Plan Update

drinking water supply. In total there are 31 public drinking water sources in the town, and three watershed areas that have been designated by the state as Outstanding Resource Waters. During future drought events, some wells in Becket may run dry, while others may have increased pollutant loads. Participants at the Town's MVP Workshop pointed out that some Becket residents have already experienced dry wells. Additional impacts of concern for Becket related to future droughts include increased susceptibility to damaging wildfire events.

Impacts of Climate Change

It is anticipated that climate change will increase the frequency, duration, and intensity of short-term droughts. According to the 2011 Massachusetts Climate Change Adaptation Report, by the end of the century (under the high emissions scenario), the occurrence of droughts lasting one to three months could go up by as much as 75%. Also, per the downscaled climate projections for the Westfield Basin as made available by the Commonwealth, both summer and fall seasons are expected to continue to experience the highest number of consecutive dry days. According to the Statewide and Major Basins Climate Projections, the region is expected to experience an annual increase of up to three consecutive dry days by the end of the century.²⁶

Rising Temperatures

Average/Extreme Temperatures

Hazard Description

There is no universal definition for extreme temperatures; the term is relative to the usual weather in the region based on climatic averages. Extreme heat for Massachusetts is usually defined as a period of three or more consecutive days above 90°F, but more generally as a prolonged period of excessively hot weather that may be accompanied by high humidity. Extreme cold is also considered relative to the normal climatic lows in a region.²⁷

Location

Extreme temperatures impact the entire state. According to NOAA, Massachusetts is made up of three climate divisions: Western, Central, and Coastal. Average annual temperatures vary slightly over the divisions, with annual average temperatures of around 46°F in the Western division where Becket is located (area labeled "1" in Figure 2. NOAA climate divisions).²⁸

²⁶ MA Statewide and Major Basins Climate Projections. Guidebook Supplement. March 2018. p. 201.

²⁷ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-143-144. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

²⁸ Ibid.

Town of Becket Hazard Mitigation Plan Update

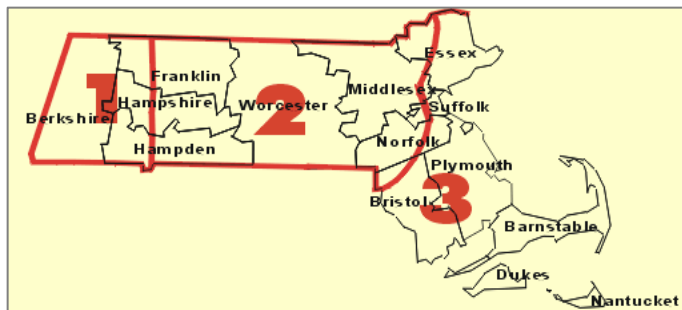


Figure 2. NOAA climate divisions

In Becket, extreme cold temperatures are more common in higher elevations, but the entire town is susceptible. Areas that are more prone to extreme heat include the more populated areas found at lower elevations in the valleys.

Extent

According to the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, extreme temperatures are relative to the region being studied. For Massachusetts, extreme heat is considered three or more consecutive days of temperatures above 90°F. Extreme cold is less well defined and is relative to wind chill. On average, Massachusetts experiences the highest consecutive days of heat in July and the lowest consecutive days of cold in January.

Wind chill temperature is the temperature people and animals feel when outside, and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. Figure 3 shows three shaded areas of frostbite danger. Each shaded area shows how long a person can be exposed before frostbite develops. In Massachusetts, a wind chill warning is issued by the National Weather Service when the Wind Chill Temperature Index, based on sustained wind, is -25°F or lower for at least three hours.

Town of Becket Hazard Mitigation Plan Update

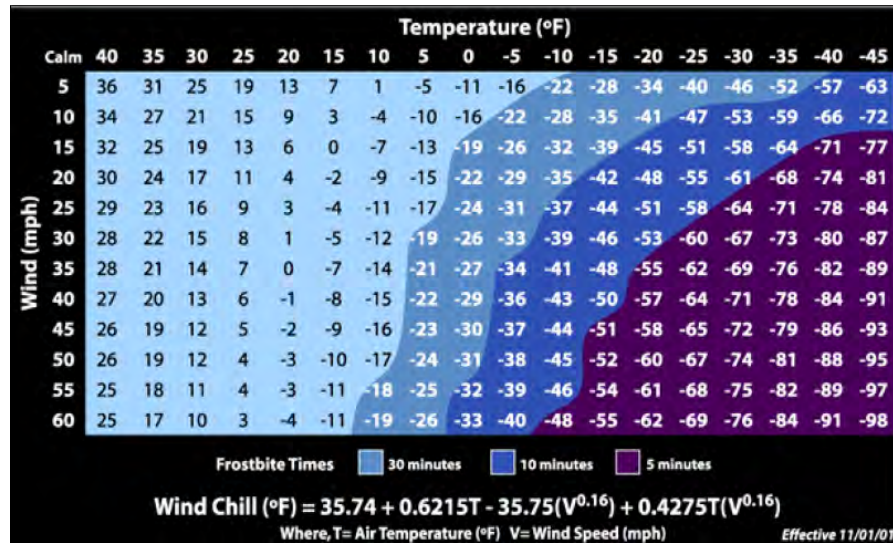


Figure 3. Wind chills²⁹

For extremely hot temperatures, the Heat Index Scale is used. This scale combines relative humidity with actual air temperature to determine risk to humans. The National Weather Service issues a Heat Advisory when the Heat Index is forecast to reach 100-104°F for two or more hours, and an Excessive Heat Warning if the Heat Index is forecast to reach 105+°F for two or more hours. Figure indicates the relationship between heat index and relative humidity.

Relative Humidity (%)		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
Relative Humidity (%)	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										
Category		Heat Index		Health Hazards													
Extreme Danger		130 °F – Higher		Heat Stroke or Sunstroke is likely with continued exposure.													
Danger		105 °F – 129 °F		Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.													
Extreme Caution		90 °F – 105 °F		Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.													
Caution		80 °F – 90 °F		Fatigue possible with prolonged exposure and/or physical activity.													

Figure 4. Heat Index³⁰

Previous Occurrences

²⁹ NOAA National Weather Service. "Wind Chill Chart." <https://www.weather.gov/safety/cold-wind-chill-chart>

³⁰ NOAA National Weather Service. "Heat Index." <https://www.weather.gov/safety/heat-index>

Town of Becket Hazard Mitigation Plan Update

According to the State Hazard Mitigation and Climate Adaptation Plan, there have been 33 extreme cold weather events in Massachusetts since 1994. Extreme cold/wind chill events were reported in February 2016 in many climate zones across the state, including Berkshire County, where many locations reported wind chills between 25 and 45 degrees below zero with winds gusting 20 to 40 miles per hour. There have also been 43 warm weather events since 1995. In June 2012, Massachusetts temperatures broke 27 heat records.

According to NOAA's Storm Events Database, Berkshire County most recently experienced excessive heat event in 2019 when a heat wave gripped Western Massachusetts from July 19th through the 21st. Temperatures soared to the low 90s with dewpoints in the low to mid-70s, which resulted in heat index values in the warmest valleys between 95 to 105°F. Cooling centers were opened and pool hours were extended.

Probability of Future Events and Changes Since the Previous Plan

Since the previous plan was prepared, the Town of Becket has noticed an increasing number of days they experience extreme temperatures. This includes summer temperatures over 100 degrees and more heat waves. In addition to the hot daytime temperatures, overnight low temperatures only falling into the 70s was common, exacerbating heat-related problems. The future probability for these types of occurrences is very high, as documented by history and climate change science.

Impact on the Community and Vulnerability

Becket has historically been relatively cool in summer because of its high elevation and large areas of forest. Many buildings do not have air conditioning. Over the coming decades, residents will likely increase installations of air conditioning. This will result in increased home energy use in warmer months and the associated costs will impact those with limited incomes the most. At the same time, energy use for home heating will decrease.

Extreme temperatures place vulnerable populations at increased risk, such as children, seniors, lower-income residents, and those already dealing with respiratory or other health problems. Extremely hot days can cause heat stress, especially for children, older adults, and those with chronic health conditions. Heat waves can be extremely dangerous and result in more deaths than cold snaps. Extreme heat can result in blackouts, stress pavement on the town's roads, and contribute to forest fire risk. Meanwhile, overall warmer temperatures can stress numerous species that have adapted to cooler conditions and can increase the prevalence of invasive species and vector-borne diseases, which can devastate ecosystems and human health.

Impacts of Climate Change

Town of Becket Hazard Mitigation Plan Update

Climate change is known to increase incidences of extreme temperatures. Table 9 is taken from the Massachusetts Climate Change Projections Report released by EOEEA in December 2017. The table shows that for the Westfield Basin (where Becket is located), not only are the average temperatures increasing, but the total number of high heat days is increasing.

Table 9. Average/Extreme Temperature Figures³¹

Westfield Basin	Observed Baseline 1971- 2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Average Annual Temperature (°F)	45.0	+2.3 to +4.6	+3.1 to +6.6	+3.6 to +9.2	+4.2 to +11.2
Annual Days with Maximum Temperature over 90°F	3	+4 to +13	+6 to +24	+7 to +42	+9 to +60
Annual Days with Minimum Temperature below 32°F	167	-11 to -28	-20 to -38	-22 to -53	-24 to -62

Wildfires

Hazard Description

A wildfire can be defined as any non-structural fire in vegetative wildland that contains grass, shrub, leaf litter, and forested tree fuels. Wildfires in Massachusetts are caused by natural events, human activity, or prescribed (human-instigated) fire. Wildfires often begin unnoticed but spread quickly, igniting brush, trees, and, potentially, homes.

The wildfire season in Massachusetts usually begins in late March and culminates in early June, corresponding with the driest live fuel moisture periods of the year. Historically, wildfire danger is highest in April. Drought, snowpack level, and local weather conditions impact the length of the fire season.³²

Location

³¹ State of Massachusetts Executive Office of Energy and Environmental Affairs and the Adaptation Advisory Committee. (2017). *Massachusetts Climate Change Projections Report*, p. x.

³² State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-171. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

Town of Becket Hazard Mitigation Plan Update

Wildfire is a natural hazard that can occur anywhere in the community, especially given the large percentage of Becket that is covered in forest. However, wildfires in this region tend to occur more often in the suburban/woodland interface or in the conifer-dominant forests that are scattered throughout the area. This trend is further validated by current wildfire hazard mapping data, which show a large amount of intermix areas across the region. Figure 5 shows the location of wildland-urban interface zones across Massachusetts and Becket (circled) as included in the State Hazard Mitigation and Climate Adaptation Plan.³³ These hazard areas include two types of wildland-urban interface areas: intermix and interface. Intermix areas are described as areas where housing and vegetation intermingle; interface areas are described as areas with housing in the vicinity of contiguous wildland vegetation.

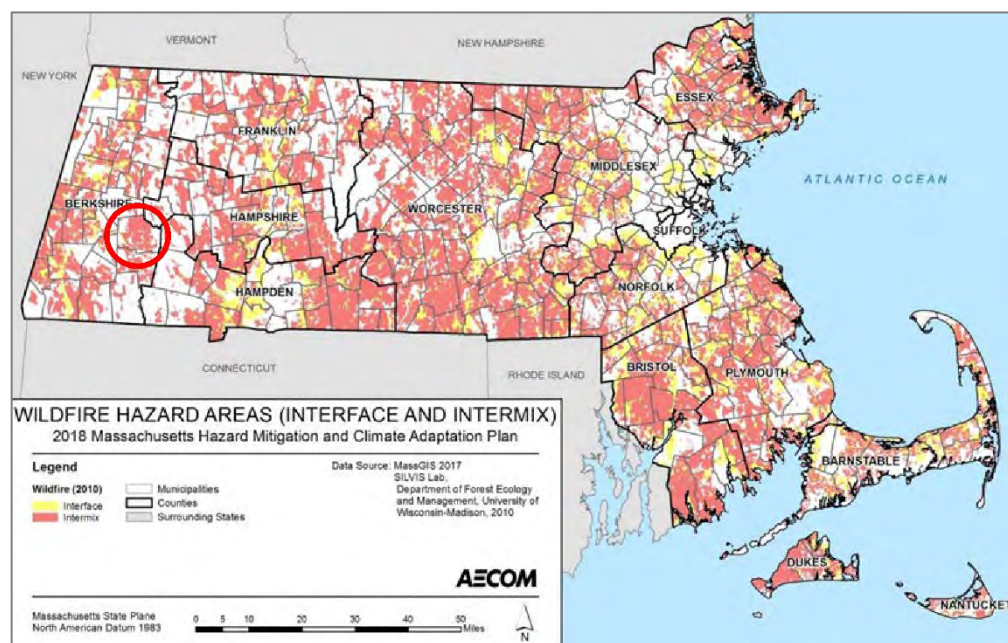


Figure 5. Wildland Urban Interface Map

Extent

Wildfires can cause widespread damage to the areas they affect. They can spread very rapidly, depending on wind speed, and can be very difficult to get under control. Fires can last for several hours up to several days.

Previous Occurrences

Several notable wildfires have occurred in Massachusetts history, although none have ever resulted in a

³³ Ibid.

Town of Becket Hazard Mitigation Plan Update

FEMA disaster declaration. According to the previous plan and NOAA's Storm Events Database, there is no recorded history of damaging wildfire events in Berkshire County. Smaller brush fires of minimal consequence are quite common throughout the region though, including in Becket.

Probability of Future Events and Changes Since the Previous Plan

Fires within the Berkshire are highly dependent on moisture and underbrush. When the region is in a drought, the chance of fire increases. Also, much of the region is no longer harvested, leading to a buildup of brush. This can lead to an increase in wildfire risk, especially in times of drought. As such, the probability of future wildfire events is predicted to increase along with the average numbers of dry and extreme-heat days. The magnitude of future events depends largely on weather, fuel conditions, and existing fire detection, control, and suppression capabilities. The presence and increasing size of the urban/woodland interface will continue to cause future wildfires and increase the potential loss of life or property.

Impact on the Community and Vulnerability

According to the 2012 Berkshire County Hazard Mitigation Plan, most of Berkshires fires small brush fires that seldom jump into trees or grow to more than an acre. However, the potential for larger, destructive fires does exist for Becket due to several factors, including the availability of fuel, large concentrations of wood-frame structures, and development within densely wooded areas throughout town. Fortunately, the magnitude and impact of most wildfire events will be contained due to early detection and fire suppression. Smoke and air pollution from wildfires even far from Becket can be a severe health hazard, but this has also been an infrequent occurrence for the planning area.

Impacts of Climate Change

It is anticipated that the effects of climate change, including more frequent and prolonged drought conditions, will increase the frequency and intensity of wildfire events. Another related factor expected to increase the probability of future wildfire events is the introduction of disease, pests, and invasive plants that result in the dieback of mature tree species, thus increasing vegetative fuel loads in forests. In addition, lightning strikes may increase with climate change and can ignite wildfires.³⁴

Invasive Species

Hazard Description

Invasive species are defined as non-native species that cause or are likely to cause harm to ecosystems, economies, and/or public health.³⁵ Invasive plants and animals are a source of concern in Becket, as they

³⁴ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-172. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

³⁵ Ibid, p. 4-188.

Town of Becket Hazard Mitigation Plan Update

are throughout the Commonwealth. Becket is fortunate to have large areas of forest, cold water streams, wetlands, and a handful of natural ponds that provide wildlife habitat, ecosystem services, recreational opportunities, and quality of life benefits. However, changing temperature and precipitation patterns combined with an expected increase in invasive species will likely stress or alter these ecosystems. As further described below, invasive species are already displacing native species throughout Becket's ecosystems, and climate change stands to make the problem worse.

Invasive species are often overlooked in the early phases of their introduction, when it would be easiest to control their spread. Becket has an active and effective hand-pulling program for aquatic invasive species. This could be expanded elsewhere, and more outreach and education could help spur early control actions.

Location

Per the Town's MVP Summary of Findings report, the current species of forest trees in Becket are not likely to survive warmer conditions. Most of the most key native trees in Becket's forests are already under stress, including sugar maple, red maple, ash, beech, and hemlock. Some trees are threatened by warmer temperatures, while others are being impacted by invasive pests. Their demise opens the way for invasive tree and shrub species to take over. Mile-a-minute vine and kudzu are two warm-weather species that could devastate Becket's forests and open lands. In addition, climate change may worsen the impact of introduced pests, such as the hemlock woolly adelgid and emerald ash borer (found in Becket in 2019), and diseases such as chestnut blight and Dutch elm disease.

Becket's shrublands are also at risk. Invasive plants such as Japanese knotweed and barberry outcompete native plants, which harms the integrity of the native ecosystem. These plants spread quickly and do not retain soil as well as a robust network of native plants, so the spread of invasive plants increases erosion and reduces ecosystem diversity. Non-native plant species displace native ones and reduce habitat and food for wildlife, among many other negative ecosystem impacts.

Becket's water resources are threatened as invasive species and algae blooms accompany increased temperatures and changes in precipitation. According to the Town's Open Space and Recreation Plan, invasive plants can already be found in many of the Becket's lakes and wetlands. Some of the lake associations use herbicides to control the plants, while others are hand-pulling them. Some plants, such as common reed (*Phragmites australis*) have colonized large areas of wetlands and lake and pond shorelines, while others, such as Eurasian watermilfoil (*Myriophyllum spicatum*) have invaded the shallow waters of many lakes and ponds.³⁶

Finally, invasive insects present widespread risks to trees and human health as further described below. Wetter and warmer conditions also lead to increased mosquito populations which can increase vector-

³⁶ Open Space and Recreation Plan, 2006. p. 32.

Town of Becket Hazard Mitigation Plan Update

borne diseases, such as West Nile Virus and Eastern Equine Encephalitis (EEE). Warmer winters can result in larger pest populations and increases the spread of tick-borne diseases like Lyme disease and babesiosis.

Extent

Invasive species are a widespread problem throughout the state, and may be monitored by observation. The State conducts surveillance to monitor the incidence of invasive species and has a variety of laws and regulations in place that attempt to mitigate their impacts. As it relates to vector-borne diseases, Becket is currently not part of the Berkshire County Mosquito Control Project (BCMCP) which serves to reduce mosquito populations through surveillance, water management, biological and chemical controls.

Previous Occurrences

Invasive species do not represent a singular event, but a chronic, on-going problem, so it is difficult to measure the frequency of occurrences.

Probability of Future Events and Changes Since the Previous Plan

Invasive species were not considered in the previous regional hazard mitigation plan; however, they are expected to be an increasing problem in Becket and throughout the State due to changing climate and projected increases in non-native plant and animal infestations. There is a particular concern that new invasive species, such as water chestnut or zebra mussels, could invade Becket's waterbodies. The Town of Becket does not have an invasive species management plan but coordinates with State authorities as appropriate.

Impact on the Community and Vulnerability

The entire community is vulnerable to negative impacts of invasive species. Invasive species already pose a significant challenge and have serious long-term consequences for ecosystem health and resilience, and as described below, these impacts are likely to increase in response to climate change. Warming temperatures will bring new invasive species to the area, as well as increases in existing pests and related vector-borne diseases which pose serious threats to human health. Invasive species will have an easier time gaining a foothold if the Town's natural ecosystems are simultaneously weakened due to changes in climatic conditions.

The broadscale change in Becket's ecosystems threatens numerous species and key qualities that make Becket what it is: its natural history and legacy. Direct impact on humans includes the potential for increased forest fires due to large quantities of standing dead wood, the loss of valuable timber species and maple sugar production, potentially reduced property values, the potential closures of recreational

Town of Becket Hazard Mitigation Plan Update

waters, and decline of popular recreational fishing species. Participants in the Town's MVP Workshop expressed particular concern in regard to the possibility that changing temperature and precipitation patterns combined with invasive species and pests will result in wide-spread forest dieback. Forest dieback could, in turn, lead to forest fires, erosion, and more rapid movement of water into streams and rivers, exacerbating flooding.

Impacts of Climate Change

Climate change affects flora and fauna as well as pests and disease vectors through changing precipitation and temperature. As described above, aquatic invasive species are already an issue in Becket's waterbodies, and they may become more extensive due to increased air and water temperatures, increased CO₂, altered stratification regimes, and altered hydrologic regimes. Warmer weather and drought also contribute to harmful algae blooms in water bodies, particularly lakes. Algae blooms were cited as a particular concern for Becket during the Town's MVP Workshop.

Warmer, wetter conditions also lead to increased mosquito populations, while the absence of sufficient periods of cold means that pest populations that would historically have been killed off or reduced are able to survive the winter and emerge in greater numbers the following season. A recent Centers for Disease Control (CDC) report showed that vector-borne diseases tripled between 2004 and 2016, with approximately 75% of cases being related to tick-borne disease.

As the Massachusetts climate begins to look more like the climate of the mid-Atlantic and southern states, it is seeing higher incidents of vector-borne diseases. 2018 marked the Commonwealth's highest ever incidence of West Nile Virus diagnosis, and 2019 marked the highest number of EEE cases in recent history. These changes present a major public and animal health challenge in terms of education, prevention, and treatment.

Extreme Weather

Hurricanes/Tropical Storms

Hazard Description

Hurricanes begin as tropical storms over the warm moist waters of the Atlantic Ocean, off the coast of West Africa, and over the Pacific Ocean near the equator. As the moisture evaporates, it rises until enormous amounts of heated, moist air are twisted high in the atmosphere. The winds begin to circle counterclockwise (north of the equator) or clockwise (south of the equator). The center of the hurricane is called the eye.

Location

Town of Becket Hazard Mitigation Plan Update

Hurricanes and tropical storms are atmospheric hazards with the potential to impact the entire town of Becket. Higher elevations are at greater risk to high winds, whereas lower elevations in the Town's many valleys are at greater risk to the inland flooding hazards that often accompany these storms.

Extent

Hurricanes can range from 50 miles to 500 miles across; in 1980, Hurricane Allen stretched across the entire Gulf of Mexico. There are generally two source regions for storms that have the potential to strike New England: (1) off the Cape Verde Islands near the west coast of Africa, and (2) in the Bahamas. The Cape Verde storms tend to be very large in diameter, since they have a week or more to traverse the Atlantic Ocean and grow. The Bahamas storms tend to be smaller, but they can be just as powerful, and their impact can reach New England in only a day or two. The majority of hurricanes that have made landfall in New England and impacted the Town of Becket were a Category 1. Hurricanes are measured by the Saffir-Simpson Wind Scale, shown in Table 10.³⁷

Table 10. Saffir-Simpson Wind Scale

Category	Sustained Winds	Types of Damage
1	74-95 mph 64-82 knots 119-153 km/h	Very dangerous winds will produce some damage. Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles will likely result in power outages that could last a few to several days.
2	96-110 mph 83-95 knots 154-177 km/h	Extremely dangerous winds will cause extensive damage. Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected, with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 knots 178-208 km/h	Devastating damage will occur. Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 knots 209-251 km/h	Catastrophic damage will occur. Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 knots/higher 252 km/h or higher	Catastrophic damage will occur. A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

³⁷ NOAA. "Saffir-Simpson Hurricane Wind Scale." <https://www.nhc.noaa.gov/aboutsshws.php>

Town of Becket Hazard Mitigation Plan Update

Previous Occurrences

Since 1900, thirty-nine tropical systems have impacted New England. Twenty-five were hurricanes and 14 were tropical storms. Any tropical storm or hurricane is capable of bringing a combination of high winds, large storm surges, and severe inland flooding along rivers and streams. Of the 24 hurricanes, nine made landfall along the southern New England coast. Of those nine hurricanes, seven of them were either of Category 2 or 3 intensity on the Saffir-Simpson hurricane scale. Though the primary threat to New England is during August and September, the region has been affected as early as June and as late as mid-October.³⁸

NOAA has kept hurricane records since 1851. From 1851 to 2018, 29 hurricane and tropical storms have come within 75 miles of Becket. These storm events have included two Category 3 hurricanes, one Category 2 hurricane, seven Category 1 hurricanes, and 16 tropical storms. Figure 6 displays these historic tracks of storms across the region.³⁹ The most damaging storms made landfall and tracked to the east of Becket, including the Great Hurricane of 1938 and Hurricane Carol in 1954 (both Category 3 hurricanes). Recent destructive impacts in the vicinity of Becket include 2011's Tropical Storm Irene, which produced widespread flooding and damaging winds across the region. The greatest impact from Irene was due to heavy rainfall resulting in widespread road closures. Strong winds also occurred across Berkshire County, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The combination of strong winds and saturated soil led to numerous downed trees and power lines, resulting in widespread long-duration power outages across the region.

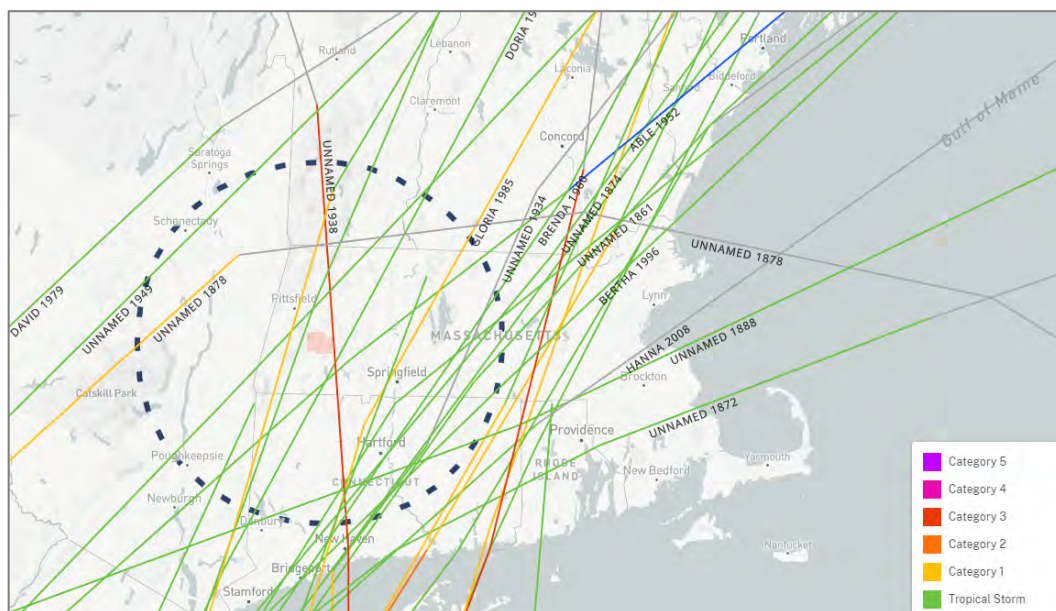


Figure 6. Historical Hurricane and Tropical Storm Tracks

³⁸ The Northeast States Emergency Consortium. "Hurricanes." <http://nsec.org/hurricanes/>

³⁹ NOAA. "Historical Hurricane Tracks." <https://coast.noaa.gov/hurricanes/>

Town of Becket Hazard Mitigation Plan Update

Probability of Future Events and Changes Since the Previous Plan

Over the last 168 years, Berkshire County has experienced a direct hit from a hurricane or tropical storm approximately once every 15 years. Combined with those that have impacted but not directly crossed over the county, the Berkshires are impacted by a hurricane or tropical storm less than every three years on average. Based on this history, it is very probable that Becket will continue to be impacted by hurricanes and tropical storms. These events are generally limited to the months of August, September, and October, with a few storms arriving in May, June, July, or November.

Impact on the Community and Vulnerability

While the coastal communities of southern New England generally take the brunt of hurricanes, flooding, and winds also affect areas much further inland. All of Becket is vulnerable to damages from hurricane winds and high levels of rainfall. Localized flooding of roads could significantly impact the town and residents' ability to travel, and the community's power and communication infrastructure could be impacted by severe winds. Additionally, high winds could down trees, impacting structures in town.

Impacts of Climate Change

According to the State Hazard Mitigation and Climate Adaptation Plan, climate change is increasing extreme weather and rising temperatures, which produces warmer oceans and more energy for storms. In addition, warmer air may hold more moisture, increasing the rate of rainfall.

Severe Winter Storm/Nor'easter

Hazard Description

Winter storms are the most common and most familiar Massachusetts hazards. The majority of blizzards and ice storms in the Commonwealth cause more massive inconvenience than they do serious property damage, injuries, or deaths. However, periodically a storm occurs which is a true disaster, necessitating intense, large-scale emergency response.

A winter storm is particularly challenging to emergency management personnel because, even though it has usually been forecast, there is no certain way to predict its length, size, or severity. For these reasons, it is imperative that local communities have clear and strict policies governing school and business closings, road use, parking, and other factors that affect the management of a serious snowstorm. It is also crucial that all snow management equipment, supplies, and personnel be in place and ready to respond to a winter storm emergency. Severe winter storms include ice storms, nor'easters, heavy snow, blowing snow, and other extreme forms of winter precipitation.

Town of Becket Hazard Mitigation Plan Update

Location

The entire town of Becket is equally at risk to winter storms. However, there is a greater chance of heavy snowfall and damaging winds at high elevations. Regardless of location, winter storms impact vulnerable populations more significantly, including seniors, lower-income residents, or others with special needs.

Extent

NOAA's National Centers for Environmental Information (NCEI) recently developed the Regional Snowfall Index (RSI) for significant snowstorms that impact the Eastern two-thirds of the U.S. The RSI ranks snowstorm impacts on a scale from 1 to 5, as shown in Table 11. RSI values are based on the spatial extent of the storm, the amount of snowfall, and the association of these elements with population and societal impacts. For mitigation planning purposes, the maximum probable extent of a severe winter storm in Becket is a Category 5 on the RSI. The climate report from Best Places shows that Becket has an average of 69 inches of snowfall each year.⁴⁰

Table 11. Regional Snowfall Index (RSI)⁴¹

Category	RSI Value	Description
1	1–3	Notable
2	3–6	Significant
3	6–10	Major
4	10–18	Crippling
5	18.0+	Extreme

There is no widely used scale to classify nor'easters. However, the classification scheme developed by Gregory A. Zielinski and presented in Table 12 is a useful index to categorize nor'easters (and other severe winter storms) by intensity. It consists of a five-level hierarchy similar to the Saffir-Simpson Hurricane Wind Scale, with a Category 1 storm being the least severe in terms of its intensity and a Category 5 storm being the most severe. For mitigation planning purposes, the maximum probable extent of a nor'easter for Becket is an Intensity Index Category 4.

⁴⁰ Best Places. "Becket." <https://www.bestplaces.net/climate/city/massachusetts/Becket>

⁴¹ NOAA National Centers for Environmental Information. "Regional Snowfall Index." <https://www.ncdc.noaa.gov/snow-and-ice/rsi/>

Town of Becket Hazard Mitigation Plan Update

Table 12. Classification Scheme for Nor'easters⁴²

Intensity Index Category	Maximum Snowfall Amounts	Maximum Snowfall Rate	Potential Wind Speeds	Maximum Drifting Potential	Closings/ Delays on Communities, Schools, and Travel	Impact on Coastal and Maritime Interests	Nature of Disruption
1	< 10 in.	Very low < 1 in./hr	Weak	Minor < 20 in.	Maybe minor (hours)	Minor	Minimal to nuisance
2	10-20+ in.	Moderate 1+ in./hr	Strong	Moderate 3 ft.	Maybe moderate (hours to a day common)	Minor to moderate	Nuisance to inconvenience
3	20-30+ in.	High 2+ in./hr	Gale force	High 4-6+ ft.	Possibly extensive/ lengthy (several days possible)	Moderate to severe	Inconvenience to crippling
4	30-40+ in.	Very High 2-3 in./hr	Gale force hurricane	Very High 6-10+ ft.	Probably extensive/ lengthy (up to a week may be common)	Severe	Crippling to paralyzing
5	40-50+ in.	Overwhelming > 3+ in./hr	Gale force hurricane	Exceptional 10-15 ft.	Extensive/ lengthy (up to a week common)	Extreme	Paralyzing

Previous Occurrences

Severe winter storms are a very frequent occurrence in Becket and the surrounding region. According to NOAA's Storm Events Database, Berkshire County experienced a total of 295 winter storm events since 1996, causing an estimated \$1.2 million in property damages. These events include those recorded as blizzard, ice storm, heavy snow, winter storm, and winter weather. Of the 22 federally-declared emergencies or disasters that have affected Berkshire County since 1953, half of these events (11) were associated with severe winter storms.⁴³

Probability of Future Events and Changes Since the Previous Plan

⁴² Zielinski, G. A. (2002). A Classification Scheme for Winter Storms in the Eastern and Central United States with an emphasis on Nor'easters. *Bulletin of the American Meteorological Society*, 83(1), 37–51. doi: 10.1175/1520-0477(2002)083<0037:acsfws>2.3.co;2

⁴³ FEMA. "OpenFEMA Dataset: Disaster Declarations Summaries - V2." <https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v2>

Town of Becket Hazard Mitigation Plan Update

Using history as a guide for the probability of future events, it can be assumed that Becket will be at affected by approximately twelve severe winter weather events per year. The highest risk of these storms occurs in January, with significant risk also occurring in December through March.

Impact on the Community and Vulnerability

Becket's location in Southern New England places it at a high risk for winter storms, including damaging Nor'easters that typically track up the East Coast with severe winds, heavy snow, and blizzard conditions. As expected, a number of public safety issues arise during severe winter storms. Impassible streets are a challenge for emergency vehicles and affect residents and employers. Snow-covered sidewalks force people to walk in streets, which are already less safe due to snow, slush, puddles, and ice. Large piles of snow can block sight lines for drivers, particularly at intersections. Not all residents are able to clear their properties, especially the elderly. In addition, when the snow melts, the potential for flooding increases, and the refreezing of melted snow causes dangerous roadway conditions. Snow and ice buildup on power lines makes power outages particularly likely. Loss of electricity is particularly threatening to the elderly and those with health concerns, who may depend on heating, cooling, or lifesaving machines for survival.

Impacts of Climate Change

Climate change is expected to increase the number of severe winter storms. "Increased sea surface temperature in the Atlantic Ocean will cause air moving north over the ocean to hold more moisture. As a result, when these fronts meet cold air systems moving from the north, an even greater amount of snow than normal can be anticipated to fall in Massachusetts."⁴⁴

Tornadoes

Hazard Description

A tornado is a narrow, violently rotating column of air that extends from the base of a cumulonimbus cloud to the ground. The observable aspect of a tornado is the rotating column of water droplets, with dust and debris caught in the column. Tornadoes are the most violent of all atmospheric storms.⁴⁵

Location

The location of tornado impact is totally unpredictable. Tornadoes are fierce phenomena which generate wind funnels of up to 200 mph or more, and usually occur in Massachusetts during June, July,

⁴⁴ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-224. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

⁴⁵ Ibid, p. 4-242.

Town of Becket Hazard Mitigation Plan Update

and August. Worcester County and areas just to its west have been dubbed the “tornado alley” of the state, as the majority of significant tornadoes in Massachusetts history have occurred in that region.

Extent

The Enhanced Fujita Scale (EF-scale), shown in Table 11, is used to categorize the strength and magnitude of tornado events based on estimated wind speeds and related damage. This represents an update to the original Fujita Scale (F-scale) and has been widely used since February 2007. For mitigation planning purposes the maximum probable extent of a tornado in Becket is an EF-3.

Table 11. Enhanced Fujita Scale⁴⁶

Rating	Wind Speed (three-second gust)	Potential Damage
EF-0	65–85 mph	Light – Causes some damage to siding and shingles.
EF-1	86–110 mph	Moderate – Considerable roof damage. Winds can uproot trees and overturn singlewide mobile homes. Flagpoles bend.
EF-2	111–135 mph	Considerable – Most singlewide mobile homes destroyed. Permanent homes can shift off foundations.
EF-3	136–165 mph	Severe – Hardwood trees debarked. All but small portions of houses destroyed.
EF-4	166–200 mph	Devastating – Complete destruction of well-built residences and large sections of school buildings.
EF-5	Over 200 mph	Incredible – Significant structural deformation of mid- and high-rise buildings.

Previous Occurrences

According to NOAA’s Storm Events Database,⁴⁷ Berkshire County experienced a total of 18 tornado events since 1950, causing seven fatalities, 60 injuries, and an estimated \$28.5 million in property damages. According to event narratives provided by the National Weather Service (where available), none of these events occurred in Becket. Prior to 2007, tornadoes were based on the Fujita Tornado Scale. During this period, Berkshire County had 17 tornadoes: two F4 events, six F2 events, five F1 events, and four F0 events. The two F4 events occurred in 1973 and 1995, and all historically recorded casualties for tornadoes in Berkshire County are attributed to these storms. Beginning in 2007, tornadoes were rated based on the Enhanced Fujita Tornado Scale as described in above. Since then, Berkshire County has had one recorded tornado event which was classified as an EF-1 event, resulting in mostly tree damage in the nearby town of Dalton.

⁴⁶ NOAA National Weather Service. “The Enhanced Fujita Scale (EF Scale).” <https://www.weather.gov/oun/efscale>

⁴⁷ NOAA National Centers for Environmental Information. “Storm Events Database.” <https://www.ncdc.noaa.gov/stormevents/>

Town of Becket Hazard Mitigation Plan Update

Probability of Future Events and Changes Since the Previous Plan

According to the State Hazard Mitigation and Climate Adaptation Plan, Massachusetts experiences an average of 1.7 tornadoes per year. While they come with a low likelihood of occurrence, tornadoes will continue to be a possible hazard threat for Becket. Tornadoes are most likely to occur in Berkshire County during the summer months; per the historical event data provided by NOAA, 14 of the 18 confirmed tornados occurred between June and August.

Impact on the Community and Vulnerability

Like other atmospheric hazards, the entire town of Becket is susceptible to tornadoes. Most tornadoes in Massachusetts are a few dozen yards wide and touch down only briefly, but even small, short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes can carve a path of destruction over a mile wide and several miles long. Although tornados are relatively rare in the region, they have been the most destructive in terms of casualties and property damage. Fortunately, to date, damaging tornadoes in the region have struck rural areas with relatively low development density.

The fact that tornadoes tend to occur mostly during summer months is important to note, as Becket's seasonal population increases substantially in the summer months. Tornadoes often develop so rapidly that little or no advance warning is possible, making them a significant safety threat.

Impacts of Climate Change

According to the State Hazard Mitigation and Climate Adaptation Plan, "Future environmental changes may result in an increase in the frequency and intensity of severe thunderstorms, which can include tornadoes."⁴⁸

Severe Weather

Hazard Description

According to the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, several frequent natural hazards in Massachusetts—particularly strong winds and extreme precipitation events—occur outside of notable storm events. This section discusses the nature and impacts of these hazards, as well as ways in which they are likely to respond to climate change.

⁴⁸ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-243. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

Town of Becket Hazard Mitigation Plan Update

Location

Major storm events have been a recurring threat to Becket throughout its history, from hurricanes bringing wind, intense precipitation, and localized flooding to winter storms delivering ice and snow. Notable historic events include the Great Hurricane of 1938—the most intense hurricane to ever strike Massachusetts—with a storm center that passed just to the east of Becket. More recently, the town has experienced increasingly regular and intense storms (severe thunderstorms and other high wind or heavy rainfall events). More intense storms delivering higher volumes of precipitation in a single event are expected to put significant pressure on dams, culverts, and other drainage infrastructure, which were all designed to handle smaller storms with more consistent distributions of precipitation.

Extent

An average thunderstorm is 15 miles across and lasts 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms. According to the 2014 National Climate Assessment, the Northeast region of the United States experienced a 71% increase in very heavy precipitation events from 1958 to 2012, and it is projected that this trend will continue and even worsen under all future emissions scenarios. In recent years, the amount of precipitation resulting from a 100-year 24-hour storm event in Boston has increased from approximately 7 inches to 9 inches. Based on these facts, Becket should expect to see similar increases in heavy rainfall events.

Previous Occurrences

According to NOAA's Storm Events Database, Berkshire County experienced a total of 878 severe weather events since 1950, which have caused one fatality, 10 injuries, and nearly \$1.8 million in property damage. These events include those recorded as hail, heavy rain, high wind, lightning, strong wind, and thunderstorm wind, as shown in Table 12.

Table 13. Severe Weather Events, Berkshire County, 1950-2019⁴⁹

Type of Event	# of Events	Fatalities / Injuries	Property Damage
Hail	178	0 / 0	\$72,200
Heavy Rain	99	0 / 0	\$0
High Wind	46	0 / 0	\$204,000

⁴⁹ NOAA National Centers for Environmental Information. "Storm Events Database."
<https://www.ncdc.noaa.gov/stormevents/xxx>

Town of Becket Hazard Mitigation Plan Update

Type of Event	# of Events	Fatalities / Injuries	Property Damage
Lightning	15	0 / 4	\$242,000
Strong Wind	61	0 / 0	\$202,600
Thunderstorm Wind	479	1 / 6	\$1,071,000
Total	878	1 / 10	\$1,791,800

Probability of Future Events and Changes Since the Previous Plan

Severe storms comprised of thunderstorms, high winds, and hail will continue to affect all of Becket with increasing frequency and intensity. While these events may occur during any month, they are most likely to occur between May and August. Many winter storm events now encompass a mixture of rain, ice, and snow, making it more difficult to maintain safe, accessible roadways. Early-season storms of wet, heavy snow when leaves were still on the trees have caused extensive damage to electrical infrastructure, leading to extended power outages.

Impact on the Community and Vulnerability

One of the ways severe weather impact this region the most is through electrical outages. During severe storms, tree branches often fall and break an electric line, causing power outages for local residents. Loss of electricity is particularly threatening to the elderly and those with health concerns, who may depend on heating, cooling, or life-saving machines for survival. Power outages are particularly likely during winter storms, when snow and ice buildup on power lines can occur. The majority of Becket's population relies on private wells powered by electricity, so outages can result in drinking water shortages for residents. Becket routinely loses power, but Eversource's efforts to trim trees and establish back-feed loops appear to be paying off. Recent power outages have been short-lived and limited in geographic area.

In addition, storms that come with extreme precipitation are expected to put significant pressure on Becket's dams, culverts, and other drainage infrastructure, which were designed to handle smaller storms with more consistent distributions of precipitation.

Impacts of Climate Change

According to NOAA, the effects of climate change on future severe weather events cannot be determined at the present time due to insufficient scientific evidence. However, multiple studies cite that the Northeast region of the U.S. will continue to experience more very heavy rainfall events (which are often associated with severe thunderstorms and other extreme weather events). The Northeast has

Town of Becket Hazard Mitigation Plan Update

already experienced a larger increase in the intensity of rainfall events than any other region in the U.S. in the last fifty years, and this trend is expected to continue.”⁵⁰

Non-Climate Influenced Hazards

Earthquake

Hazard Description

An earthquake is a combination of different phenomena. An earthquake initiates with the sudden slip of rock on either side of a crack in the earth, called a fault. The sliding of the rock on the fault due to the rock slippage radiates seismic waves in all directions. The seismic wave vibrates the surface and are experienced as the ground shaking. Different kinds of seismic waves travel at different speeds and have different amplitudes, or strengths. For this reason, even though the rock slippage that initiates an earthquake might be over in a few or several seconds, the ground shaking radiated by a large earthquake slip on a fault can last many tens of seconds.⁵¹

Location

Because of the regional nature of the hazard, the entire community of Becket is equally susceptible to earthquakes. There are five normal faults in Massachusetts. Three of them traverse portions of Berkshire County, but there is no discernable pattern of previous earthquakes along these fault lines. Unlike other areas of the country, where earthquakes occur along known fault lines, earthquakes in the Northeast do not correlate with the many known faults that exist in the region. They occur in the middle of plates, far from the plate boundaries.⁵²

Extent

The magnitude and intensity of an earthquake is measured by the Richter Scale and the Modified Mercalli Intensity (MMI) scale, respectively. The Richter Magnitude Scale (shown in Table 14) measures the amount of seismic energy released by an earthquake, while the Modified Mercalli Intensity Scale (shown in Table 15) describes the intensity of an earthquake based on its observed effects at a site where earthquake shaking is felt.⁵³ For mitigation planning purposes, the maximum probable extent of an earthquake in Becket is a 6.5 on Richter Scale and Intensity VII on Modified Mercalli Intensity Scale.

⁵⁰ State of Massachusetts. (2018). *Massachusetts State Hazard Mitigation and Climate Adaptation Plan*, p. 4-254. <https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>

⁵¹ Northeast States Emergency Consortium. “Earthquake Hazards.” <http://nasec.org/earthquakes-hazards/>

⁵² <http://nasec.org/earthquakes-hazards/>

⁵³ <http://nasec.org/earthquakes-hazards/>

Town of Becket Hazard Mitigation Plan Update

Table 14. Richter Scale.⁵⁴

Magnitude	Effects
< 3.5	Generally, not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most, slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Table 15. Modified Mercalli Intensity Scale.⁵⁵

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs.	
II	Feeble	Some people feel it.	< 4.2
III	Slight	Felt by people resting; like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	Destructive	Moving cars become uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; the ground cracks; pipes break open.	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes, and cables destroyed; general triggering of other hazards.	< 8.1
XII	Catastrophic	Total destruction: trees fall; ground rises and falls in waves.	> 8.1

⁵⁴ Encyclopedia Britannica. "Richter scale." <https://www.britannica.com/science/Richter-scale>

⁵⁵ U.S. Geological Survey. "The Modified Mercalli Intensity Scale." <https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale>

Town of Becket Hazard Mitigation Plan Update

Previous Occurrences

Earthquakes occur on a regular basis in the Northeastern United States. According to the Weston Observatory Northeast Earthquake Catalog, more than 5,000 earthquakes have occurred in the region since 1638, including more than 1,500 earthquakes in New England and more than 350 with epicenters in Massachusetts. Generally, most earthquakes that occur in the Northeastern U.S. are small in magnitude and cause little to no damage, though ground shaking is felt across large areas due to the geologic composition and rock structure of the region. In terms of potential impacts, this makes the specific location of the epicenter in the Northeast less relevant than in other regions of the U.S.

Between 1924 and 2016, there were 105 earthquakes in the Northeast measuring a magnitude 4.5 or greater on the Richter scale. Out of these 104 earthquakes, 10 were centered within New England and the other 94 occurred within New York State and the Province of Quebec. Historically, moderately damaging earthquakes strike somewhere in the region every few decades, and smaller earthquakes are felt approximately twice per year. The largest known New England earthquakes occurred in 1638 (magnitude 6.5) in New Hampshire, and in 1755 (magnitude 5.8) offshore from Cape Ann northeast of Boston. The most recent New England earthquake to cause moderate damage occurred in 1940 (magnitude 5.6) in central New Hampshire. Reported damages included toppled chimneys, cracked walls, broken water pipes, fallen plaster, and broken furniture.⁵⁶

According to data gathered for the 2012 Regional Hazard Mitigation Plan, of the 144 earthquakes recorded in the Massachusetts between 1668 and 1997, only three occurred in the Berkshires (in 1932, 1963 and 1982). The 1932 event occurred at Lake Garfield in Monterey, but the magnitude is unknown. The 1963 earthquake, which registered as 2.4, is reported to have occurred in North Adams, but Berkshire Regional Planning Commission found the data unreliable, as the geographic coordinates given by the U.S.GS put it in Savoy. The 1982 earthquake also occurred in North Adams and is registered at 2.0.⁵⁷

Probability of Future Events and Changes Since the Previous Plan

Although New England has not experienced a damaging earthquake in many years, seismologists state that a serious earthquake occurrence is possible. Based on historic occurrences, which have been few and of limited severity, Becket should be considered low risk for major earthquake damage in the future. Because the region's geologic faults zones do not correlate strongly to earthquake locations or aid in predication of occurrence, it is difficult to determine probability. However, Becket falls within a

⁵⁶ Weston Observatory at Boston College. <https://www.bc.edu/content/bc-web/schools/mcas/sites/weston-observatory.html>

⁵⁷ Berkshire County. (2012). *Berkshire County Hazard Mitigation Plan*, p. 51. https://www.townofgb.org/sites/greatbarringtonma/files/uploads/mitigation_plan.pdf

Town of Becket Hazard Mitigation Plan Update

seismic zone with a peak ground acceleration value of 10%g, which is considered low risk in terms of potential ground shaking and damage from such an event.

Impact on the Community and Vulnerability

The entire population of Massachusetts is potentially exposed to direct and indirect impacts from earthquakes. The degree of exposure depends on many factors, including the age and construction type of the structures where people live, work, and go to school, and the soil types on which these buildings are constructed.

Most buildings and infrastructures in Massachusetts were constructed without earthquake-resistant design features. Massachusetts introduced earthquake design requirements into the building code in 1975, and improved building codes for seismic reasons in the 1980s. However, these specifications apply only to new or extensively modified existing buildings. Buildings, bridges, water supply lines, electrical power lines and facilities built before the 1980s may not have been designed to withstand the forces of an earthquake. Seismic standards were upgraded in the 1997 revision to the State Building Code. Older buildings in the town, including some historic properties, are most vulnerable to earthquakes. Earthquake damage to bridges or other key infrastructure assets could lead to travel challenges. Underground infrastructure, such as water, gas, or electric lines, may also be negatively impacted by an earthquake.

Earthquakes impact the economy, including loss of business functions, damage to inventories, relocation costs, wage losses, and rental losses due to the repair or replacement of buildings. According to the State Hazard Mitigation and Climate Adaptation Plan, in terms of vulnerabilities, earthquakes may displace residents, and some of those residents may require sheltering. Vulnerable populations tend to be the most susceptible to displacement, including those living at or below the poverty line and the elderly.

Impacts of Climate Change

The effects of climate change have no relation to the probability or magnitude of future earthquake events.

Technological and Human Caused Hazards

Dam Failure

Hazard Description

Town of Becket Hazard Mitigation Plan Update

A dam failure occurs when the structural collapse of a dam releases the water being detained or stored behind it. Dam failures are usually the result of the age of the structure, inadequate spillway capacity, or structural damage caused by an earthquake or flood. Failures due to prolonged periods of rainfall can result in overtopping (the most common cause), and total failure occurs if internal erosion, overtopping, or damage results in a complete structural breach. Overtopping occurs when a dam's spillway capacity is exceeded and portions of the dam that are not designed to convey flow begin to pass water, erode away, and ultimately fail. Other potential causes of dam failure include design flaws, foundation failure, internal soil erosion, inadequate maintenance, or mis-operation.

Location

According to the Massachusetts Office of Dam Safety's database, there are 19 state-regulated dams located in Becket. These include three dams classified as High Hazard and seven dams classified as Significant Hazard (descriptions for each type of hazard classification is provided under *Extent*). **Error! Reference source not found.** shows the location of all dams, with the High Hazard and Significant Hazard dams marked in red and yellow respectively.⁵⁸ Flood-related impacts from dams will be localized and the area of impact can be fairly accurately delineated; however, dam failure inundation maps do not exist for most dams in Becket.

Most dams located in Becket are privately owned, though the Office of Dam Safety has regulatory authority over all those with hazard classifications. More information on these dams and others included in the State's database is provided in Table 165 (in alphabetical order). Other dams or similar impoundments in Becket are generally smaller and have not been issued hazard classifications.

⁵⁸ Dam locations as derived from the Massachusetts Dams data layer provided by MassGIS, current as of 2012. Not all point locations have been confirmed by the Office of Dam Safety; however, the High and Significant Hazard dams for Becket have been verified. <https://docs.digital.mass.gov/dataset/massgis-data-dams>

Town of Becket Hazard Mitigation Plan Update

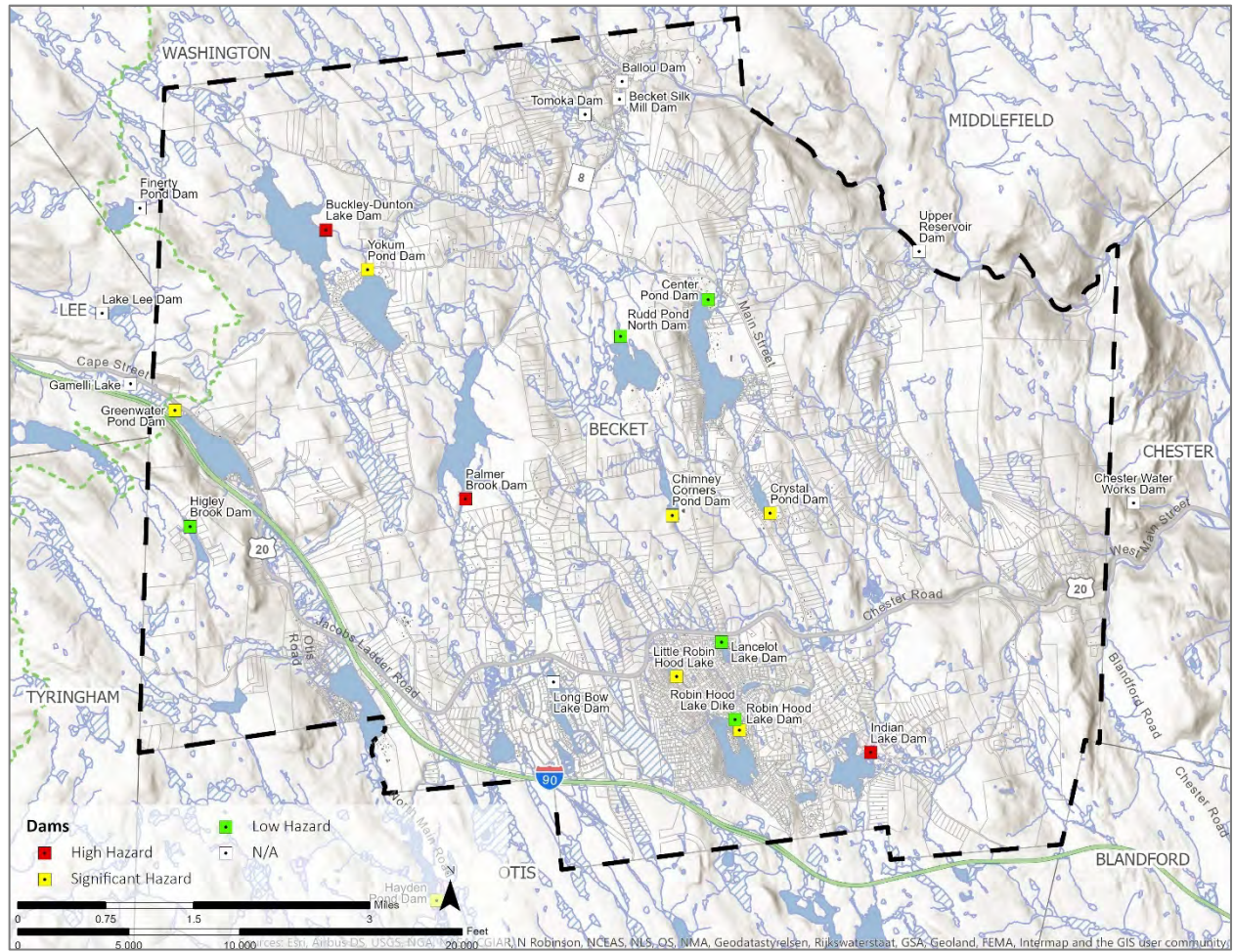


Figure 7. Dam Locations

Table 16. State-Regulated Dams in Becket

Dam Name	Owner Type	Owner	Hazard Classification
Ballou Dam	Public	Town of Becket	N/A
Becket Silk Mill Dam	Public	Town of Becket	N/A
Buckley-Dunton Lake Dam	Public	State of Massachusetts (DCR)	High Hazard
Center Pond Dam	Private	Private	Significant Hazard
Chimney Corners Pond Dam	Private	Private Association / Non-profit	Significant Hazard
Crystal Pond Dam	Private	Private	Significant Hazard
Greenwater Pond Dam	Public	State of Massachusetts (DCR)	Significant Hazard
Higley Brook Dam	Private	Private	Low Hazard
Indian Lake Dam	Private	Private	High Hazard
Lancelot Lake Dam	Private	Private	Low Hazard
Little Robin Hood Lake	Private	Private	Significant Hazard
Long Bow Lake Dam	Public	Town of Becket	N/A
Palmer Brook Dam	Private	Private	High Hazard
Robin Hood Lake Dam	Private	Private	Significant Hazard

Town of Becket Hazard Mitigation Plan Update

Robin Hood Lake Dike	Private	Private	Low Hazard
Rudd Pond North Dam	Private	Private Association / Non-profit	Low Hazard
Tomoka Dam	Private	Private	N/A
Upper Reservoir Dam	Private	Private	N/A
Yokum Pond Dam	Public	Private	Significant Hazard

Extent

Dam breaches often lead to catastrophic consequences as the water rushes in a torrent downstream, flooding an area engineers refer to as an “inundation area.” The number of casualties and the amount of property damage depends on the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Dams in Massachusetts are assessed according to their risk to life and property. The State has three hazard classifications for dams:⁵⁹

- *High Hazard:* Dams located where failure or improper operation is likely to cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.
- *Significant Hazard:* Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, or secondary highways or railroads, or cause interruption of use or service of relatively important facilities.
- *Low Hazard:* Dams located where failure or improper operation may cause minimal property damage to others. Loss of life is not expected.

It is important to note that these hazard classifications are not related to the physical condition or structural integrity of the dam (nor the probability of its failure), but strictly to the potential for adverse downstream effects if the dam were to fail. Under state law, owners of High Hazard dams must develop Emergency Action Plans (EAPs) that outline the activities that would occur if the dam failed or appeared to be failing. The Plan would include a notification flow chart, list of response personnel and their responsibilities, a map of the inundation area that would be impacted, and a procedure for warning and evacuating local residents in the inundation area. Owners of Significant Hazard dams are also strongly encouraged to also develop EAPs. According to the National Inventory of Dams, of the ten high or significant hazard dams in Becket, only two had up-to-date EAPs, three had outdated EAPs, and there was no record of an EAP for the remaining five.⁶⁰

Previous Occurrences

⁵⁹ Massachusetts Department of Conservation and Recreation, Office of Dam Safety.

⁶⁰ United States Army Corps of Engineers. (2018). “National Inventory of Dams.”
<https://nid.sec.usace.army.mil/ords/f?p=105:1:>

Town of Becket Hazard Mitigation Plan Update

Becket is no stranger to dam failure. In November 1927, an impoundment below Rudd Pond collapsed, and floodwaters swept through North Becket Village. Within 25 minutes, the flood had killed one person and destroyed several homes, four factories, and the post office. The damage (in 1927 dollars) was estimated to be \$1.5 million. The factories were never rebuilt, and North Becket Village, which was the commercial hub of the town, was permanently changed. With this event in mind, Becket officials remain vigilant and concerned about the condition of the dams within the town, most notably at Rudd Pond and Buckley-Dunton Lake.



Figure 8. Remnants of the Becket post office and other buildings destroyed by the 1927 dam failure event. (Image credit: The Berkshire Eagle)

Aside from this destructive event in Becket, dam failures have been very infrequent occurrences in Berkshire County. However, many of the dams within the region are more than 100 years old, and some are approaching 200 years old, which raises some concern and highlights the importance of routine inspection and maintenance procedures of those dams with hazard classifications.

Probability of Future Events and Changes Since the Previous Plan

Dam failure is not a common occurrence, but dams do represent a potentially disastrous hazard. Heavy rainfall events that accompany major storms such as hurricanes and tropical storms can pose seasonal threats to dams in the region, especially during particularly wet summers. The likelihood of dam failure also increases if dams are not maintained. As cited in the 2012 plan, the lack of maintenance is a serious concern for many Berkshire County communities. By law, dam owners are responsible for the proper maintenance of their dams, and are responsible for having their dams inspected on a regular basis.

Town of Becket Hazard Mitigation Plan Update

Although not under the Town's ownership, Becket's High Hazard and Significant Hazard dams have reportedly been maintained and are considered in good condition. They were not specifically identified as a priority for resiliency improvements during the Town's MVP Workshop. Several dams in town have recently been repaired, including Lancelot Lake Dam in Sherwood Forest, where work was funded by several state grants totaling over \$750,000. However, MVP Workshop participants still expressed concerns about the capacity of dam owners throughout town to maintain and manage their dams, especially in the face of increasing storm events.

Impact on the Community and Vulnerability

As experienced in the 1927 event, the sudden release of water caused by a dam failure can lead to extensive flooding, with the potential to cause human casualties, economic loss, and environmental damage. Flood damage occurs as a result of the momentum of the flood caused by the sediment-laden water, flooding over the channel banks, and impact of debris carried by the flow. Dam failure events with little to no warning time pose the greatest risk to human life and safety.

While dam failures that occur during flood events compound an already tenuous situation and are certainly problematic, the dam failures that occur on dry days are the most dangerous. These "dry day" dam failures typically occur without warning, and downstream property owners and others in the vicinity of the inundation zone are more vulnerable to being unexpectedly caught in life-threatening situations than failures during predicted flood events.

Climate Change Impact

It is anticipated that the effects of climate change will not increase the probability of dam failure events, though projected increases in the frequency of extreme precipitation events (as described in previous sections) should continue to be considered in the regulation, construction, operation, and maintenance or repair of dam structures. As further explained in the State Hazard Mitigation and Climate Adaptation Plan, there are a number of ways in which climate change could alter the flow behavior of a river, causing conditions to deviate from those the dam was initially designed to handle. Therefore, although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Critical Facilities

Critical facilities are considered structures or institutions necessary for emergency response and recovery. These facilities must continue to operate during and following a disaster to reduce the severity of impacts and accelerate recovery. Critical facilities typically include airports, emergency operation centers (EOCs), fire stations, hospitals, police stations, schools, government buildings, and railroad

Town of Becket Hazard Mitigation Plan Update

stations. Table 17 lists critical facilities as identified by Town staff and community stakeholders during the MVP and hazard mitigation planning process.

Table 17. Critical Facilities

Facility	Address	Function	Generator? (y/n)
Fire Station #1	108 Washington Street	Fire Station & Alternate EOC	Yes
Fire Station #2	629 Jacob's Ladder Road	Fire Station & Alternate EOC	Yes
Police Department	557 Main Street	Police Department	Yes
Becket Ambulance Depot	629 Jacob's Ladder Road	Ambulance and Health Services	Same as FS#2
Town Hall	557 Main Street	Town Hall and EOC	Yes, same as PD
Town Garage	47 Lyman Street	Public Works	No
Becket/Washington School	12 Maple Street	Elementary School	Yes
Becket Athenaeum	3367 Main Street	Library/Warming or Charging Center	No
Becket Arts Center	7 Brooker Hill Road		No
Becket Land Trust & Historic Center	12 Brooker Hill Road		No
Becket-Chimney Corners YMCA	748 Hamilton Road	Recreation	Yes
Jacob's Pillow	358 George Carter Road	Entertainment	Yes
Canterbury Farm	1986 Fred Snow Rd		No
Dream Away Lodge	1986 Fred Snow Road		No
Camp Chimney Corners	748 Hamilton Road	Summer Camp	Yes, same as YMCA
Camp Watitoh	1885 Main Street	Summer Camp	Yes
Camp Greylock	1525 Main Street	Summer Camp	Yes
Bonny Rigg Campground	59 Main Street	Summer Camp	No
First Congregational Church	22 YMCA Road	Place of Worship	No
Becket Federated Church	3381 Main Street	Place of Worship	No
Becket General Store	3235 Main Street	Groceries / Restaurant	No
Papa Bob's	71 Chester Road	Entertainment	No
Sherwood Shoppe	437 Wells Road	Groceries / Restaurant	No

Town of Becket Hazard Mitigation Plan Update

Historic Properties

While not considered critical facilities, the Town of Becket does have many buildings on the National Register of Historic Places (NHRP). NRHP-listed properties in the Town consist of three historic districts as described below.

Becket Center

This historic district encompasses the area at the junction of Massachusetts Route 8 and YMCA Road: the original early center of town. This area was the town's civic heart and a center of industry until it was eclipsed in importance by North Becket, which was served by the railroad. Most of the architecture in the district is in the Federal and Greek Revival styles popular in the late 18th to mid-19th centuries. The district includes numerous historic properties, including an old post office, old town hall, and a former schoolhouse that has been converted to a residence. The district was added to the National Register of Historic Places in 1982.

North Becket Village Historic District

In 1841, the Western Railroad arrived, and the historic village of North Becket rapidly developed into the main economic and civic center. Over a twenty-year period, many of the Town's public institutions moved to the village, and a cluster of Greek Revival residences were built on the west side of Main and High Streets. Many of the village's industries and commercial buildings were wiped out by the 1927 dam failure event described earlier in this section, leaving only foundational remnants. Today, the district has around 35 historically significant buildings, including many fine examples of Greek Revival architecture. It was listed on the National Register of Historic Places in 1988.

Middlefield-Becket Stone Arch Railroad Bridge District

This historic district, which extends through parts of the towns of Chester, Middlefield, and Becket, encompasses a 3.7-mile stretch of railroad right of way in which there are ten historic keystone arch bridges crossings, including nine over the west branch of the Westfield River. These granite bridge structures, built beginning in the 1830s, were the first keystone arch railroad bridges built in America. The district was added to the National Register of Historic Places in 1980.

In addition to the three nationally registered historic districts described above, Jacob's Pillow Dance Festival, the home of America's first and longest-running dance festival, is designated as a National Landmark for its importance in America's culture and history.

Also, Route 20 in Becket is part of the Jacob's Ladder Trail Scenic Byway, a state-recognized scenic byway.

Town of Becket Hazard Mitigation Plan Update

Additional priorities for historic preservation in Becket include the following properties: Pleasant Street Quarry, Bancroft Village, Higley Apothecary Shop, Becket Quarry and Forest (a major intact quarry owned by the Becket Land Trust), two state YMCA camps (particularly Gibson Hall), Fred Snow House (birthplace of major Mormon leader), Mallen House (the quarry museum), Brewster House (restored Colonial), and Boulder Grange (1890's estate).⁶¹

National Flood Insurance Program Insured Structures

B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

To further understand the financial impact of floods, information was gathered from the Massachusetts Department of Conservation and Recreation regarding current flood insurance policies and repetitive loss properties in Becket. Repetitive loss properties are those for which two or more losses of at least \$1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978.

According to NFIP records, there are no repetitive loss properties in Becket. Since 1978, there have been a total of only seven insured flood losses, totaling \$46,615 in paid claims. As of March 31, 2020, there are only 27 NFIP policies in force in the community: a total of approximately \$6.6 million in insurance coverage. This includes 25 policies for single-family residential structures and two policies for non-residential structures, all adding up to nearly \$21,500 in annual NFIP premiums. Nine of these NFIP policies are for structures located within FEMA-mapped special flood hazard areas (areas of highest risk) and 18 are for structures located in lower risk areas.⁶²

Summary of Vulnerability

The Town's previous hazard mitigation plan (Berkshire County Regional Hazard Mitigation Plan) listed the region including Becket to be most at risk to flooding, winter storms, and severe storms. The results of the updated risk analysis for Becket (as shown in Table 17) is consistent with the Town's previous findings. Each hazard is categorized according to high, moderate, or low risk ranking.

⁶¹ Berkshire Regional Planning Commission. (2014). *Historic Preservation: An Element of Sustainable Berkshires, Long-Range Plan for Berkshire County*, p. HPB-6-7.

http://berkshireplanning.org/images/uploads/documents/Sustainable_Berkshires-Historic_Preservation-20140320.pdf

⁶² FEMA Community Information System, March 31, 2020.

Town of Becket Hazard Mitigation Plan Update

Table 187. Hazard ranking⁶³

Hazard Risk Ranking	Hazards
High	Flooding Severe Winter Storms/Nor'easter Severe Weather
Moderate	Average/Extreme Temperatures Hurricanes/Tropical Storms Dam Failure Invasive Species Tornadoes Wildfires
Low	Drought Earthquake

Through the MVP and hazard mitigation planning process, the Town of Becket has developed the following vulnerable locations of concern. It used this list to develop the hazard mitigation strategy.

- Summer camps, which draw thousands of young people to Becket in the summer.
- Jacob's Pillow, which draws tens of thousands of visitors.
- Roads that get may icy (Jacob's Ladder Road east of the Mass Pike, Leonhardt Road), may flood (Jacob's Ladder Road south of the Mass Pike near Greenwater Pond, Hamilton Road), or are vulnerable to erosion (Leonhardt Road, Route 8 south of North Becket center, Main Street between McNerney Road and Carter Road. Some of these roads are on steep slopes.
- Route 20 east of Route 8, which is a key route into and out of Becket and has potential for landslide and/or flooding.
- Culverts that are undersized and/or structurally deficient, including those at Hamilton Brook under Hamilton Road, Benton Hill Road at the intersection of Surriner Road, and YMCA Road at South Cove Road.
- Areas that could be a priority for conservation, including Palmer Brook Reservoir and wetlands and floodplains throughout town.
- Areas of beaver activity with potential to flood roads or other infrastructure: behind the Becket motel; adjacent to YMCA road west of the First Congregational Church; north of the Mass Pike between Arrowhead Lane and Old Carriage Lane; County Road west of Stanley Road; near the intersection of Yokum Pond Road and Leonhardt Road; Bancroft Road near Surriner Road; Wade Inn Road east of Big Bass Lane; Bonny Rigg Hill Road near Spark Brook; Quarry Road near Cushman Brook.

⁶³ Berkshire County. (2012). *Berkshire County Hazard Mitigation Plan*, p. 70.

https://www.townofgb.org/sites/greatbarringtonma/files/uploads/mitigation_plan.pdf

Town of Becket Hazard Mitigation Plan Update

- Cell towers throughout Town that are critical for emergency communication.
- Flooding: west of Shaw Pond.
- Waterways: the Westfield River, which is a federally designated Wild and Scenic River; and Palmer Brook, which is impaired.
- Lakes throughout town. Lakes are a key draw for seasonal visitors and essential to Becket's economy. Most are man-made. Dams may be vulnerable to increased water. Lakes may experience warming water, lower water levels, increases in toxic algae, and increases in invasive aquatic species.

Chapter 5. Capability Assessment

The purpose of the capability assessment is to identify the strengths and weaknesses of the Town in mitigating risks. The capability assessment looks at current proficiencies as well as any change in capabilities from the previous mitigation plan. The capability assessment serves as the foundation for designing an effective hazard mitigation strategy. It not only helps establish the goals for the mitigation plan but ensures that those goals are realistically achievable under local conditions.

The capability assessment assesses the Town's pre- and post-disaster hazard management capabilities and its financial resources for mitigating risk. Government departments, first responders, and regional resources were each considered. The Town of Becket is prone to flooding, severe winter storms, and severe weather. Government and town leaders are aware of these risks and work to proactively mitigate them.

C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

The Summary of Findings from the Community Resilience Building Workshop in January 2020 included a list of current strengths and assets. This list was reviewed and sorted to represent strengths and assets in society, environment, and infrastructure. These three categories were chosen because of their relevance and consistency with the Municipal Vulnerability Preparedness Program. In addition, these categories were used in the Mitigation Strategy.

For reference, the categories include the following list of potential facilities (as defined on pages 12 and 13 in the Community Resilience Building Workshop Guide):

1. **Infrastructure:** culverts, bridges, stormwater basins, conveyances, roads, public water supply, wastewater infrastructure, underground storage tanks, electrical and communications infrastructure, buildings and facilities, beavers, dams, Berkshire gas, microgrid
2. **Environment:** PCBs, wildlife habitat, trees and forests, invasive species, water quality, local agriculture, debris management
3. **Society:** water-based recreation, vulnerable neighborhoods, vulnerable populations, communications systems, shelters, schools, childcare centers, pest and disease control, provisions, medicine and fuel, economic revitalization, stress on emergency services, transportation, local and state regulations, parks, open space

Strengths and Assets

The list of strengths and assets below is taken directly from the Becket MVP Summary of Findings, April 2020.

Town of Becket Hazard Mitigation Plan Update

Infrastructural Strengths

Roads

- Town roads are generally well maintained.
- Private roads, especially more recent ones, were well designed and are often well maintained, partially as a result of the Town's effective subdivision review regulations and process.
- The road districts provide an effective funding and maintenance mechanism for roads that could otherwise become problematic.



Figure 7 U.S. Bonnie Riggs Road Culvert.

Road-stream crossings (bridges and culverts)

- Some culverts have been replaced and upgraded to current standards, including on Bonnie Rigg Hill Road.

Utilities

- Most cell towers are fairly accessible in case there is need for an emergency repair.
- Eversource actively maintains power lines in Becket and has been creating back-feed loops from multiple sources to prevent loss of electricity during severe weather events. During recent weather events, power outages have been short and limited to smaller areas.
- Broadband is currently being installed in Becket.

Wells/septic systems

- The lack of a centralized drinking water and wastewater system provides a lot of redundancy for these essential services in Becket.

Structures

- Compared to other communities, Becket does not have a high number of flood-prone structures. Waterways are often contained in channels with steep banks, preventing the waterways from spilling their banks.
- Compared to other western Massachusetts communities, Becket has a relatively high proportion of recently built structures.

Societal Strengths

Populations

- Older adults are a resource for the town, particularly related to volunteerism, expertise, and wisdom.

Town of Becket Hazard Mitigation Plan Update

- Yankee culture. Becket residents are generally self-sufficient and resilient, but some are unwilling to ask for or accept help.
- Seasonal houses support the town's tax base while requiring fewer services, putting Becket in a better fiscal position than some neighboring communities.

Social Cohesion

- The town has a strong sense of community and friendliness. There are many volunteers.
- Some vulnerabilities only impact some parts of town, leaving others able to help.
- There are several email lists in town, for example, for the Athenaeum, the Arts Center, and the Town list. All are opt-in.
- Several businesses are social centers, including Sherwood Shoppes, General Store, and Papa Bob's

Good and services

- Becket has several businesses. This is increasingly rare in rural communities in Western Massachusetts.
- Becket has a fair number of jobs for a rural community. About 185 residents work in Becket.

Cultural institutions

- Becket Athenaeum is a strength
- Mullen House, Becket Arts Center are strengths and provide youth programs.
- Hilltown Brouhaha (Becket/Washington Community Fair) builds community.
- Jacob's Pillow draws huge crowds to Becket. It is an economic and cultural asset, but potentially a significant challenge if a hazard impacted it.



Figure 8 Becket Arts Center

Town Government/Emergency Management

- Compared to many small towns, Becket has strong municipal services. For example, it has full-time police, ambulance service, and Town Administrator.
- Reverse 911 is in place, but enrollment is low, and alerts only go to landlines. Greater redundancy would be beneficial. The phone list needs to be updated regularly.
- The Berkshire County Sheriff provides 911 dispatch for 27 Hampden and Hampshire communities from its headquarters in Pittsfield. The Sheriff's Office also has a mobile command center and command tent. The Dispatch Center can be tapped into for MREs/emergency food resources.
- The camps have facilities like beds and kitchens and are equipped to take care of large groups of people. It may be possible to expand their use as shelters and for emergency food supply.

Town of Becket Hazard Mitigation Plan Update

- Town Hall is on high ground and is centrally located.
- One fire station and ambulance station are on high ground. The other fire station, serving Washington and Becket, is on a low-lying parcel.
- The Town's planning and zoning bylaws/regulations have been updated regularly and are progressive.

Demographic changes

- In the coming decades, demographic changes will likely impact Becket's resilience. Some trends that may drive demographic changes include: climate migration from areas that will become unbearably hot, storm-prone, or inundated by sea level rise; regional transportation changes (for example, if another exit was added to the Mass Pike⁶⁴); digital communication improvements (for example, expansion of broadband and 5G); and changes in the broader economy (for example, an increase in remote working). Demographic changes could impact the town's climate resilience in many ways: the number of members of vulnerable groups in the Town could go up or down; changes in the culture of the town could impact self-reliance, volunteerism, or community connectedness for better or worse; the economy of the town could strengthen or weaken; new development could be sited in vulnerable areas or could improve the resilience of existing areas.
- How the town plans for and responds to demographic and economic changes will play a major role in whether those changes decrease or increase the town's resilience.

Environmental Strengths

Water Resources

Wetlands

- There are approximately 1,800 acres of wetlands in Becket, covering about 6% of the Town's land area. These provide habitat for a wide variety of plants and animals, including rare and endangered species. They also provide temporary storage of floodwaters, which helps reduce water volume and velocity in rivers and streams during storms. Numerous wetlands in Becket serve critical flood reduction functions but are not currently conserved. In particular, there is a large wetland on the west side of Sherwood Forest and north of the Massachusetts Turnpike that has

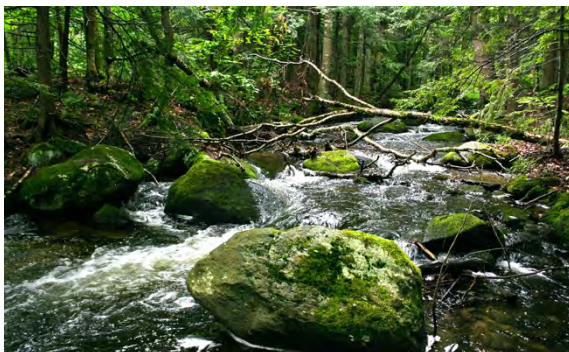


Figure 9 Rocks on Yokum Brook

⁶⁴ In March 2020, MassDOT completed a study of a new Massachusetts Turnpike exit between Westfield and Lee. The study concluded a new exit in Blandford would be feasible from a "conceptual engineering perspective." It ruled out a new exit in Becket. The report does not mean that a new exit is politically feasible or whether funding could be obtained. The report is available at: Derrig et al., "I-90 Interchange Study." The report shows that a new exit would significantly increase traffic on Route 8 in Becket while even more significantly reducing traffic on Route 20 in town.

Town of Becket Hazard Mitigation Plan Update

significant flood storage capacity. This land was platted for house lots before environmental regulations made development of the lots infeasible.

Ponds and Lakes

- Becket's ponds and lakes provide natural cooling opportunities for residents and visitors. This will become increasingly valuable as temperatures rise due to climate change.
- Becket has an active and effective hand-pulling program for aquatic invasive species. This could be expanded elsewhere.

Forests

- About 86% of Becket's land area is forested, including about 15,000 acres of deciduous forest and 10,000 acres of evergreen forest. Large forested areas filter air and water and reduce the speed of stormwater runoff. By performing these functions, they help maintain the health of the town's water bodies and drinking water supplies and reduce risk for flood-prone structures. Becket's forests also sequester carbon. The northwest portion of Becket is part of October Mountain, Massachusetts's largest state park. There are significant blocks of unfragmented forest in Becket, particularly in this northwest quadrant of the town.

Protected Land

- About 6,000 acres of land are permanently protected in Becket, representing nearly 20% of the town's land area. The majority of that is October Mountain State Forest. This land is mostly upland forest and provides ecosystem services such as water and air purification as well as wildlife habitat.

FEMA defines four types of capabilities, as shown below.

1. **Planning and Regulatory Capabilities:** capabilities based on the jurisdiction's implementation of ordinances, policies, local laws, and State statutes, and plans and programs that relate to guiding and managing growth and development.
2. **Administrative and Technical Capabilities:** capabilities associated with the jurisdiction's staff and their skills and tools that can be used for mitigation planning and implementation.
3. **Financial Capabilities:** the fiscal resources a jurisdiction has access to or is eligible to use to fund mitigation actions.
4. **Education and Outreach:** programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

The Town Administrator completed a questionnaire regarding capabilities, and additional information was gathered from stakeholder interviews and the MVP Workshop. The questionnaire is based on the one in FEMA's *Local Mitigation Planning Handbook*. The questionnaire is broken into the four categories

Town of Becket Hazard Mitigation Plan Update

defined above: Planning and Regulatory; Administrative and Technical; Financial; and Education and Outreach. Responses from the questionnaire are summarized in each corresponding section.

Planning and Regulatory Capabilities

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. The first step in the capability assessment was to gather and review existing plans to gain an understanding of the Town's current ability to mitigate risk.

The plans the Town has in place—a Comprehensive Plan and an Open Space and Recreation Plan—are very old and do not include information toward mitigating risk. The Town Administrator has a Capital Improvements Plan that includes replacing vehicles over the next five years but does not mention hazard mitigation. The MVP and Hazard Mitigation Planning process have encouraged the Town to consider developing a Continuity of Operations Plan. The Emergency Management Director, who is also the Police Chief, maintains the required Emergency Operations Plan. The Town adheres to State-level building codes and typical zoning and subdivision codes. They do not specifically name hazards, and the Town does not exceed typical requirements.

The Town Administrator completed the Safe Growth Survey. This is a survey designed to capture general information regarding how the Town is positioned to grow safely relative to natural hazards. It is included in Appendix C. The table below shows the average score for each category of question. Based on a scale of 1-5 (with 1 being Strongly Disagree and 5 being Strongly Agree), the results show that Becket's Safe Growth policies are strong. The largest area for possible improvement is Transportation.

Category	Average Score based on how much the respondent agreed with the questions
Land Use	3.6
Transportation	3
Environmental Management	4
Public Safety	4
Zoning Ordinance	4
Subdivision Regulations	4
Capital Improvement Program and Infrastructure Policies	3.6
Other	3.6

Figure 1. Safe Growth Survey Results

Administrative and Technical Capabilities

While the Town considers itself fully staffed, they do not have a Community Planner, Civil Engineer, or GIS Coordinator. Some staff members play multiple roles; for instance, the Highway Superintendent is the Floodplain Manager and the Tree Warden. The Town Administrator writes grants for the Town. Fortunately, Becket has Mutual Aid Agreements with all adjacent towns to support emergency response. The Police Chief in Becket is considered the Emergency Manager.

Town of Becket Hazard Mitigation Plan Update

The Town has a Reverse 911 system at this time. In addition, WiredWest,⁶⁵ a consortium of western-Massachusetts hill towns building fiber-optic networks, is bringing Becket Broadband to the Town. The Town participates in several regional planning groups, including the Western Massachusetts Medical Reserve Corps and the Housatonic Valley Association (HVA). Town staff and residents also participate in watershed groups including the Housatonic River Watershed, the Farmington River Watershed, and the Westfield River Watershed Association.

Many boards in Becket are staffed by citizen volunteers and are quite active. The figure below shows the meeting schedule for the Town's boards and committees.

REGULARLY SCHEDULED TOWN OF BECKET COMMITTEE AND BOARD MONTHLY MEETINGS:	
Board of Health	1st Wednesday, 5:00 p.m.
Board of Selectmen:.....	1st and 3rd Wednesday, 7 p.m.
Conservation Commission.....	4th Tuesday, 6:30 p.m.
Energy Committee.....	3rd Tuesday, 4:00p.m.
Finance Committee	1st Thursday 5:30p.m.
Historical Commission.....	2nd Tuesday, 3 p.m.
Planning Board:	2nd Wednesday, 7 p.m.
Zoning Board of Appeals.....	1st Tuesday, 7 p.m. as needed

Figure 10 Committee and board monthly meeting schedule

Financial Capabilities

Financial capabilities include any and all funds collected for the use of hazard mitigation. The Town has limited financial resources and relies on state programs for financial assistance. Becket has previously secured Small Bridge grants and Mass Works grants. Their general funds budget does not include hazard mitigation. They do not collect fees

for water, sewer, gas, or electrical services. They did receive MVP and Hazard Mitigation Assistance funds to develop this plan. Previously, they received HUD Community Development Block Grant funding and used it for housing rehabilitation, not for infrastructure development.

Education and Outreach Capabilities

Education and outreach capabilities include emergency training, public outreach campaigns, and other school or business-related education programs focused on hazard mitigation. The Town does not have disaster-specific education or outreach programs. However, the regional school system offers some safety education. The Core Team did an exceptional amount of outreach as part of the MVP program. They held multiple information sessions educating the community about climate change.

National Flood Insurance Program Participation

C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?
(Requirement §201.6(c)(3)(ii))

⁶⁵ Becket Broadband. "Frequently Asked Questions." <https://becketbroadband.org/faq>

Town of Becket Hazard Mitigation Plan Update

The Town of Becket is in good standing with the National Flood Insurance Program (NFIP). The table below includes statistics from data gathered through a survey completed by the Town, and from Joy Duperault, Massachusetts NFIP Coordinator and Deputy Hazard Mitigation Officer. The Town does not participate in the Community Rating System (CRS). The Town's regulations prohibit building in the floodplain. The Town Administrator completed an NFIP questionnaire, which indicated that the Highway Superintendent is the Town's floodplain administrator. The Town does not adhere to any "higher standard" flood regulations. They have not integrated floodplain management into other planning mechanisms and are not currently pursuing any actions to adhere to the NFIP more closely. However, this Plan does include many mitigation actions that will mitigate flood risk in Becket. The picture below shows the Center Pond Brook overtopping Route 8.

Table 19. NFIP statistics

NFIP Entry Date	3/8/1977
Current Effective FIRM	08/05/1991
Policies in force as of 3/2/2020	27
• Single-family policies	25
• 2-4 family policies	0
• Non-residential	2
Insurance in force as of 3/2/2020	\$6,555,200.00
Written premiums in force as of 3/2/2020	27
Total losses	
• Number of claims payments	6
• \$ of closed paid losses	\$46,615.00
• Adjustment expense	\$3,600.00
Repetitive Loss Properties (RLPs)	0
• Total losses for RLPs	0
Severe Repetitive Loss Properties (SRLs)	0
• Total losses for SRLs	0
Most recent Community Assistance Visit (CAV)	9/1/2000
Most recent Community Assistance Contact (CAC)	4/25/1996

Town of Becket Hazard Mitigation Plan Update



Figure 11 Route 8 over Center Pond Brook

Summary of Findings and Conclusions

The Town of Becket has the capacity to mitigate risk by implementing this hazard mitigation plan. They have a reverse 911 system and the capacity to actively engage residents. The list of strengths and assets from the CRB Findings shown at the beginning of this chapter certainly illustrates the strengths of the Town's society, environment, and infrastructure. As illustrated in this chapter, the Town of Becket has an extensive road and bridge

system to navigate over the many river crossings, they have broadband capacity, and they have a dedicated emergency management system. These strengths contribute to the Town's mitigation strategy (shown in the next chapter) by allowing them to actively seek grant funding and manage mitigation projects. In the future, the Town of Becket intends to expand their capabilities to mitigate risk by implementing the actions in the mitigation strategy and maintaining this Hazard Mitigation Plan Update.

Chapter 6. Mitigation Strategy

The hazard mitigation strategy is the culmination of work presented in the planning area profile, risk assessment and capability assessment. It is also the result of multiple meetings and thorough public outreach. The work of the Core Team was essential in developing the mitigation goals and actions included in this chapter. As described in Chapter 3 (Planning Process), the Core Team worked in a consistent, coordinated manner to identify and prioritize the goals and mitigation actions for this Plan.

Mitigation Goals

C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))

Mitigation *goals* represent broad statements that are achieved through the implementation of more specific mitigation *actions*. These actions include both hazard mitigation policies (such as land use regulations) and hazard mitigation projects (such as structure or infrastructure projects). The 2012 Berkshire County Hazard Mitigation Plan included one regional goal statement and six supporting goal statements. These were reviewed and it was determined that to best represent the current interests in Becket the goals should be revised.

The concepts from the previous goal statements, structural projects to reduce risk of flooding, increasing capacity of the Town to mitigate risk, increasing public awareness and improving existing policies to reduce risk were all included in the new goal statements. The Core Team developed these goal statements to reflect priorities as well as the highest hazards identified in the Community Resilience Building Workshop. Climate change is identified as a significant concern and adaptation as a priority for the Town. Flooding remains the Town's biggest natural hazard concern and is a risk the Town is actively working to mitigate. Finally, increasing public awareness and the public's ability to mitigate risk is a priority for the Core Team.

The list below shows the current list of mitigation actions.

6. Reduce losses of life, property, infrastructure and cultural resources from natural hazards and climate change.
7. Prioritize green solutions and environmental protection when implementing all mitigation actions.
8. Investigate, design, and implement infrastructure projects to reduce and minimize the risk of flooding.
9. Increase public awareness of natural hazard risks and mitigation activities through education and outreach.
10. Integrate hazard mitigation principles into Town government regulations and plans.

Town of Becket Hazard Mitigation Plan Update

Mitigation Actions

C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

The Core Team reviewed the mitigation actions from the 2012 plan that Becket was responsible to implement and identified completed actions and those needing revision.

Table 20 Mitigation Action Status

2012 Mitigation Measure	2020 Status and Notes
Stabilize bank and reconstruct westbound land of Brooker Hill Road.	This project is not deemed relevant in 2020.
Ensure the safety of citizens and rescue personnel using Brooker Hill Road – Maintain Barriers on road and signage declaring one-way traffic.	This project is not deemed relevant in 2020.
Incorporate new FEMA floodplain data and maps into existing and future planning efforts.	This is relevant and considered a capability. All new floodplain data will be utilized.
Continue to strictly enforce floodplain Bylaws.	This is considered a capability of the Town.
Limit the expansion of infrastructure in hazard-prone areas.	This is considered a capability of the Town.
Encourage the floodproofing or relocation of existing structures in floodplain zones.	This action is moving forward to 2020 as it is deemed necessary.
Ensure the integrity of large beaver dams or breach them in a controlled manner.	This is considered a capability of the Town.
Continue to work with Mass. Fish & Game to investigate permanent measures to minimize beaver impacts.	This is considered a capability of the Town.
Continue to partner with Beaver Solutions to control flooding.	This is considered a capability of the Town.
Replace culvert under Benton Hill Road and others to handle beaver dam failure.	The Town submitted a grant for engineering plans.
Determine if DPW facility is in the floodplain; if so, investigate methods to protect building and equipment.	This action is moving forward to 2020 as it is deemed necessary.
Determine which major transportation routes are in inundation areas for dams of High or Significant Hazard.	This was completed as part of the MVP and HMP planning processes.
Continue to prioritize and improve Stormwater management systems that are located in hazard prone areas or are inadequate.	This project is not deemed relevant in 2020.
Develop bylaws that require on-site containment of stormwater.	This project is not deemed relevant in 2020.

Town of Becket Hazard Mitigation Plan Update

Encourage the use of low-impact development techniques, especially in flood-prone areas.	This is an on-going capability of the Town's and prioritized through the MVP and HMP planning processes.
Increase the working relationship between upstream and downstream dam owners.	This is an on-going capability of the Town's and prioritized through the MVP and HMP planning processes.
Provide leaflets to landowners in hazard prone areas that discuss hazard mitigation.	This has not been completed and becomes part of the education and outreach actions for 2020.
Showcase successful hazard mitigation Projects.	Bonny Rigg Hill Culvert is an example of a showcase project.
Determine ability of town governmental centers to withstand a variety of natural hazard events.	Completed.
Identify historic structures, businesses and critical facilities located in hazard-prone areas, including floodplains and dam failure inundation areas.	Completed.
Help local businesses to retrofit or floodproof their properties.	This project is not deemed relevant in 2020.
Provide workshops to help local historic properties and businesses to develop disaster mitigation plans for their facilities.	This has not been completed and becomes part of the education and outreach actions for 2020.
Conduct local disaster response drills and feature them in local news media.	As part of the Town's outreach to private industry including camps, they may hold response drills and emergency management workshops. To date these have not been done.
Develop and publicize local and regional evacuation routes and shelter locations	The Town Emergency Management Director does not feel it is necessary to publicize evacuation routes, however, increasing mitigation outreach to the public is needed.
Develop formal and legally binding Mutual Aid Agreements for emergency response teams and DPWs.	Mutual Aid Agreements are in place and included as a capability of the Town.
Fill communications gaps by adding new towers where necessary, using existing towers and structures were possible.	The Town is not responsible for adding cell phone towers. The Town does need a radio tower to increase emergency communication capacity.
Increase local and regional emergency response training.	The Emergency Management Director participates in regional emergency management training.
Re-evaluate shelter capacity for Becket residents and determine each shelter's structural ability to withstand natural disaster events.	This action moves forward in a revised format.
Improve record-keeping of local natural disasters and their impacts.	This becomes a capability of the Town.

Comprehensive Range of Mitigation Actions

To develop a new list of mitigation actions, the Core Team carefully reviewed the list of high-, medium- and low-priority recommendations from the CRB Workshop Summary of Findings. A spreadsheet that included all of these recommendations was developed and the recommendations were modified/combined and in some cases omitted until the final list of mitigation actions was determined.

Town of Becket Hazard Mitigation Plan Update

The Core Team and each responsible department considered the hazards identified in the risk assessment, the outcomes of the capability assessment, and the five identified mitigation plan goal statements when developing the final list of mitigation actions.

In addition to the suggestions from the CRB Workshop, a comprehensive range of mitigation actions were considered. During each Core Team meeting, the group was educated on the possible range of mitigation actions. The Federal Emergency Management Agency's online *Mitigation Ideas* publication was shared, and the following list of example actions was shared electronically with the Core Team.

Types of Mitigation Actions

Local Plans and Regulations

- Comprehensive plans
- Land use ordinances
- Subdivision regulations
- Development review
- Building codes and enforcement
- NFIP Community Rating System
- Capital improvement programs
- Open space preservation
- Stormwater management regulations and master plans

Structure and Infrastructure Projects

- Acquisitions and elevations of structures in flood-prone areas
- Utility undergrounding
- Structural retrofits
- Floodwalls and retaining walls
- Detention and retention structures
- Culverts

Natural Systems Protection

- Sediment and erosion control
- Stream corridor restoration
- Forest management
- Conservation easements
- Wetland restoration and preservation

Education and Awareness Programs

- Radio or television spots
- Websites with maps and information
- Real estate disclosure

Town of Becket Hazard Mitigation Plan Update

- Presentations to school groups or neighborhood organizations
- Mailings to residents in hazard-prone areas

Preparedness and Response Actions

- Creating mutual aid agreements with neighboring communities to meet emergency response needs
- Purchasing radio communications equipment for the Fire Department
- Developing procedures for notifying citizens of available shelter locations during and following an event

Mitigation Action Plan

C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

An online Mitigation Action Tracker was developed for the Town to track the implementation of each mitigation action. The Mitigation Action Tracker is a Google Sheet with separate tabs showing pre-sorted actions and can sort the list of actions based on a number of criteria.

During the Community Resilience Building Workshop, participants prioritized all identified actions by high, medium, or low for priority. Choices were made based on:

- Funding availability and terms
- Agreement on outstanding impacts from recent hazard events
- Necessity for advancing longer-term outcomes
- Contribution towards meeting existing local and regional planning objectives⁶⁶

After each item was prioritized, workshop participants discussed and then agreed upon the highest-priority actions across the three profiles of infrastructure, society, and environment. These decisions were made based on “existing programs into which priority actions can be integrated easily or used to strengthen related actions with existing funding.”⁶⁷ The Core Team reviewed these lists and refined them to develop the current list of mitigation actions and their priority order.

The Core Team further refined the list of mitigation actions to include:

- Action Title
- Action Description
- Estimated Cost
 - Very high (over \$1 million)

⁶⁶ Community Resilience Building Workshop Guide. Retrieved from https://docs.wixstatic.com/ugd/29a871_4840fcbf56c54f8b8064c264b9ec4bee.pdf, 15.

⁶⁷ Ibid, 18.

Town of Becket Hazard Mitigation Plan Update

- High (\$500,000 - \$1 million)
- Medium (\$100,000 - \$500,000)
- Low (\$50,000 - \$100,000)
- Very low (under \$50,000)
- Potential Funding Source
- Lead Department
- Possible Partners
- Implementation Schedule (month/year start and end dates within a five-year period)
- Problem Addressed

Beyond the bulleted list above, the Mitigation Action Tracker includes the following categories of information.

1. Relevant Mitigation Plan Goal (1-5)
2. Type of Mitigation Project (local plans and regulations, structural projects, natural systems protection, education programs, and preparedness and response actions)
3. Critical Facility Protection (yes or no)
4. Community Components (infrastructure, society, or environment)
5. Hazards Addressed
 - a. Changes in Precipitation (flooding, drought)
 - b. Sea Level Rise (costal erosion, coastal flooding)
 - c. Rising Temperatures (average or extreme temperatures, wildfires, invasive species)
 - d. Extreme Weather (hurricanes/tropical storms, severe winter storm/nor'easter, tornadoes, severe weather)
 - e. Earthquake
 - f. Dam Failure

Below is a list of all mitigation actions (sorted by priority order). The mitigation actions are also shown in Appendix D (sorted by lead department and sorted by priority).

1	Culvert Assessment	
Action Description	Conduct a town-wide culvert assessment to identify those that need retrofit. Review the Housatonic Valley Association flood risk analysis for culverts in Becket that may need retrofit.	
Top Priority	Responsible Party	Highway Department
	Problem Addressed	Roadway Flooding, Washouts
	Potential Partners	
	Cost Estimate	Low
	Possible Funding Sources	Complete Streets Grant
	Timeline	August 2020 - July 2022

Town of Becket Hazard Mitigation Plan Update

	Hazards	Flooding, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Severe Weather
	Critical Facility Protection	Yes
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Infrastructure
2	Outreach Plan	
Action Description	Develop an outreach and education plan for all residents that includes how to sign-up for the Reverse 911 system, how to mitigate potential impacts of climate change such as heavier rain events, periods of drought or high heat, and power outages.	
Top Priority	Responsible Party	Emergency Management Department
	Problem Addressed	Public Education, Emergency Communication
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	March 2021- August 2024
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Outreach and Education
	MVP Community Component	Society
3	Shelter Management Plan	
Action Description	Develop a shelter management plan that includes identifying and retrofitting shelters (Town Hall, YMCA Camp) if necessary. Include an education and transportation component so citizens know where to go during a disaster and those that cannot travel are assisted. Include a plan for cooling and warming centers. Include energy resilience strategies with clean energy sources. Prioritize locations that are currently significant energy users so that clean energy sources reduce Becket's greenhouse gas emissions.	
Top Priority	Responsible Party	Emergency Management Department

Town of Becket Hazard Mitigation Plan Update

	Problem Addressed	Greenhouse Gas Emissions, Emergency Shelters
	Potential Partners	MEMA
	Cost Estimate	Medium
	Possible Funding Sources	Town
	Timeline	March 2021- August 2024
	Hazards	Flooding, Average/Extreme Temperatures, Wildfires, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Tornadoes, Severe Weather, Earthquake, Dam Failure
	Critical Facility Protection	Yes
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Society

4	Town Master Plan	
Action Description	Update the Town's Master Plan to include smart growth best practices as well as plans for climate adaptation, conservation, and hazard mitigation.	
Top Priority	Responsible Party	Planning Board
	Problem Addressed	Update Plan
	Potential Partners	BRPC
	Cost Estimate	Low
	Possible Funding Sources	Grant/Town Funds
	Timeline	September 2020 - August 2023
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Society

Town of Becket Hazard Mitigation Plan Update

5		Forest Study	
Action Description	Conduct a broad-scale study and plan for forests in Becket. The study would document forest composition in Becket, the various functions of forests, how forests may change in the coming decades. The plan would set the Town’s goals, objectives and actions for forest management, including climate resiliency. Disseminate findings of the study and plan to residents and landowners to encourage forestry across the town that is aligned with Town goals. Topics could include, use of nature-based solutions on private land, management of invasive plants, responding to forest pests, carbon sequestration, holistic forest management, fire management, and existing resources for landowners like the Landowner Incentive Plan (LIP) through UMass MassWoods. [Ecosystem Changes]		
Top Priority	Responsible Party	Conservation Commission	
	Problem Addressed	Forest Management, Fire Management, Invasive Species, Greenhouse Gas Emissions	
	Potential Partners	BRPC	
	Cost Estimate	Low	
	Possible Funding Sources	Grant/Town Funds	
	Timeline	September 2020 - August 2023	
	Hazards	Wildfires, Invasive Species,	
	Critical Facility Protection	No	
	Type of Mitigation Action	Local Plans and Regulations	
	MVP Community Component	Environment	
6		Wetland/Floodplain Protection	
Action Description	Identify and protect wetlands and floodplains that are especially valuable for mitigating the impacts of climate change, because they reduce floods, maintain water quality, and maintain biodiversity among other benefits. Where possible, acquire conservation restrictions or purchase high priority wetlands and floodplains and adjacent properties for floodplain expansion. Partner with land trusts where possible. If possible, coordinate this action with an update of the Opens Space and Recreation Plan and/or the Town Master Plan. [Flooding] [Ecosystem Change]		
Top Priority	Responsible Party	Conservation Commission	
	Problem Addressed	Flooding, Biodiversity, Wetland/Floodplain Conservation	
	Potential Partners		

Town of Becket Hazard Mitigation Plan Update

	Cost Estimate	Medium
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2024
	Hazards	Flooding, Hurricanes/Tropical Storms,
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
7	Culvert Replacement	
Action Description	Replace culverts at the following locations to prevent flooding, Leonhardt Road, Hamilton Road, YMCA Road, Route 8 between McNerney and Carter. Replace Benton Hill Road culvert. Replace the culvert on Cushman Brook at Quarry Road.	
High	Responsible Party	Highway Department
	Problem Addressed	Roadway Flooding, Washouts
	Potential Partners	
	Cost Estimate	High
	Possible Funding Sources	Grant/Town Funds
	Timeline	August 2020 - July 2025
	Hazards	Flooding, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Severe Weather
	Critical Facility Protection	Yes
	Type of Mitigation Action	Structure and Infrastructure
	MVP Community Component	Infrastructure
8	Highway Garage	
Action Description	Move the Highway Garage out of the floodplain for the purposes of natural flood storage. Clean-up and revegetate the current site.	

Town of Becket Hazard Mitigation Plan Update

High	Responsible Party	Town Administrator
	Problem Addressed	Flooding
	Potential Partners	
	Cost Estimate	High
	Possible Funding Sources	Town
	Timeline	August 2020 - July 2025
	Hazards	Flooding, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Severe Weather
	Critical Facility Protection	Yes
	Type of Mitigation Action	Structure and Infrastructure
	MVP Community Component	Infrastructure

9	Radio Tower	
Action Description	Build a two-way radio repeater tower to enhance EMS and other emergency communications.	
High	Responsible Party	Town Administrator
	Problem Addressed	Emergency Communication
	Potential Partners	Sheriff/Neighboring Towns
	Cost Estimate	High
	Possible Funding Sources	Town
	Timeline	September 2020 - October 2023
	Hazards	All Hazards
	Critical Facility Protection	Yes
	Type of Mitigation Action	Structure and Infrastructure
	MVP Community Component	Infrastructure

Town of Becket Hazard Mitigation Plan Update

10	Zoning Regulations	
Action Description	Review zoning and subdivision regulations for smart growth best practices [Ecosystem Changes]	
High	Responsible Party	Planning Board
	Problem Addressed	Update Zoning/Regulations
	Potential Partners	BRPC
	Cost Estimate	Very Low
	Possible Funding Sources	Grant/Town Funds
	Timeline	September 2020 - October 2024
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Society
11	Public Education Program	
Action Description	Develop a public education and communication program that educates citizens in rural Becket about the potential impacts of climate change and what organizations exist (such as the Berkshire Regional Planning Association) who can provide support to home owners with issues such as sealing wells to prevent contamination from flood waters, back-up power and renewable energy sources. [Resilience]	
High	Responsible Party	Community Preservation Committee
	Problem Addressed	Public Education
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	March 2021- August 2024

Town of Becket Hazard Mitigation Plan Update

	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Society
12	Open Space and Recreation Plan	
Action Description	Update the town’s Open Space and Recreation Plan (OSRP). Include consideration of priority parcels to conserve, wildlife corridors, and ecological landscaping. [Ecosystem Changes, Flooding]]	
High	Responsible Party	Town Administrator
	Problem Addressed	Land Conservation, Wildlife Corridors
	Potential Partners	BRPC
	Cost Estimate	Low
	Possible Funding Sources	Grant/Town Funds
	Timeline	September 2020 - August 2023
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Environment
13	Water Resource Plans	
Action Description	Develop holistic plans for water resources in Becket, especially lakes. The plans could include cover management of the water resources themselves, including management of aquatic invasive species, water quality monitoring, citizen science efforts, consideration of establishing a town boat washing station, and maintenance and/or removal of dams. Plans could also establish recommendations for appropriate activities adjacent to waterways including development intensity, septic system maintenance, maintaining vegetated buffers, minimizing pesticide use, etc. [Ecosystem Change]	
High	Responsible Party	Conservation Commission

Town of Becket Hazard Mitigation Plan Update

	Problem Addressed	Invasive Species, Water Management, Dam Failure, Flooding
	Potential Partners	
	Cost Estimate	Low
	Possible Funding Sources	Grant/Town Funds
	Timeline	September 2020 - August 2024
	Hazards	Flooding, Invasive Species, Dam Failure, Hurricanes/Tropical Storms, Severe Weather
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment

14	Palmer Brook Reservoir	
Action Description	Purchase Palmer Brook Reservoir for conservation (purchase by Town, land trust, conservation group, combination, etc.) [Resilience]	
High	Responsible Party	Town Administrator
	Problem Addressed	Land Conservation,
	Potential Partners	
	Cost Estimate	High
	Possible Funding Sources	Town
	Timeline	August 2020 - July 2025
	Hazards	Flooding, Average/Extreme Temperatures, Wildfires, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Severe Weather,
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment

Town of Becket Hazard Mitigation Plan Update

15	Flooding/Erosion Control	
Action Description	Control flooding and erosion along stream banks with nature based solutions like maintaining buffers, revegetation and slowing movement of water into streams.	
High	Responsible Party	Conservation Commission
	Problem Addressed	Flooding
	Potential Partners	
	Cost Estimate	Medium
	Possible Funding Sources	Town
	Timeline	August 2020 - July 2025
	Hazards	Flooding, Hurricanes/Tropical Storms, Severe Weather
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
16	Wetlands Bylaw	
Action Description	Adopt a local wetlands bylaw. [Ecosystem Changes]	
High	Responsible Party	Planning Board
	Problem Addressed	Bylaw, Wetland Conservation
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2023
	Hazards	Flooding, Hurricanes/Tropical Storms
	Critical Facility Protection	No

Town of Becket Hazard Mitigation Plan Update

	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Environment
17	Invasive Species	
Action Description	Create a baseline survey and action plan for invasive species in Becket and neighboring communities. [Ecosystem Changes]. Survey trees near roads, powerlines, and other critical infrastructure to identify those impacted by pests. Remove dead/dying trees before they fall on roads, powerlines, and critical facilities) [Severe Weather]. Focus on early eradication of invasive and minimizing movement of invasive species along waterways from their headwaters in Becket to downstream communities. Remove phragmites and restore native vegetation to improve floodplain functioning. [Flooding] Develop an early eradication program for Japanese knotweed to minimize streambank erosion. [Ecosystem Changes] [Flooding] Educate residents of Becket about emerald ash borer and other tree pests, including proper disposal of effected wood, to minimize their spread. [Ecosystem Changes]	
High	Responsible Party	Conservation Commission
	Problem Addressed	Invasive Species, Infrastructure Damage,
	Potential Partners	
	Cost Estimate	Medium
	Possible Funding Sources	Town
	Timeline	October 2020 - November 2023
	Hazards	Invasive Species
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
18	Disease Vector Control	
Action Description	Develop plans for control of disease-vectors with a focus on nature-based solutions for controlling mosquitos and ticks. [Ecosystem Changes]	
High	Responsible Party	Board of Health

Town of Becket Hazard Mitigation Plan Update

	Problem Addressed	Disease Vectors
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	August 2020 - September 2025
	Hazards	
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
19	Biodiversity	
Action Description	Review bylaws to identify measures that will preserve biodiversity, habitat integrity and water resources. [Ecosystem Changes]	
High	Responsible Party	Planning Board
	Problem Addressed	Biodiversity, Habitat Preservation
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	August 2020 - September 2025
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
20	Evacuation Plans	

Town of Becket Hazard Mitigation Plan Update

Action Description	Develop evacuation plans for hazard materials releases, especially related to the Mass Pike and rail line.	
High	Responsible Party	EMD
	Problem Addressed	Hazardous Materials
	Potential Partners	MA Emergency Management Agency
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2023
	Hazards	Hazardous materials
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
21	Amend Local Bylaws	
Action Description	Review and amend current local bylaws, subdivision ordinances, and zoning regulations to reduce risk and damages from extreme weather, heat, flooding and other climate change impacts. Include requirements for low impact development best practices, incentives to develop away from high hazard areas, hydrologic study requirements, and updated road standards. Include a requirement that the Town consider the feasibility of pervious paving whenever retrofitting or building parking lots on Town property and that private entities do the same for major developments.	
Medium	Responsible Party	Bylaw Review Committee
	Problem Addressed	Damages to Infrastructure, Update regulations/bylaws
	Potential Partners	
	Cost Estimate	Low
	Possible Funding Sources	Grant Funds?
	Timeline	September 2020 - August 2024
	Hazards	All Hazards

Town of Becket Hazard Mitigation Plan Update

	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Infrastructure
22	Land Use Study	
Action Description	Conduct a land use study of areas in Becket with concentrated development and a high probability of flood inundation to assess potential for, and mitigate, well and septic cross contamination	
Medium	Responsible Party	Town Administrator
	Problem Addressed	Flooding, Septic Contamination
	Potential Partners	BRPC
	Cost Estimate	Low
	Possible Funding Sources	Grant/Town Funds
	Timeline	March 2021 - April 2024
	Hazards	Flooding, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Severe Weather, Invasive Species
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Infrastructure
23	Town Road Sedimentation	
Action Description	Conduct a study of town owned roads to identify areas of high sedimentation and identify potential maintenance solutions to reduce sedimentation and maintain clean ditches.	
Medium	Responsible Party	Highway Department
	Problem Addressed	Sedimentation, Roadway Flooding, Washouts
	Potential Partners	

Town of Becket Hazard Mitigation Plan Update

	Cost Estimate	Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2024
	Hazards	Flooding, Average/Extreme Temperatures, Hurricanes/Tropical Storms, Severe Winter Storm/Nor'easter, Tornadoes, Severe Weather
	Critical Facility Protection	Yes
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Infrastructure

24	Dam Outreach Program	
Action Description	Maintain a list of dams and dam owners at the Town Hall. Develop an outreach program to private dam owners to educate them about dam maintenance requirements including inspections, pre-flood release coordination and safety information.	
Medium	Responsible Party	Conservation Commission
	Problem Addressed	Flooding, Dam Failure
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	August 2020 - July 2022
	Hazards	Dam Failure, Flooding
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Infrastructure

25	Expansion of Green Community Program	
Action Description	Create a climate mitigation plan for Becket including an inventory of greenhouse gas emissions across the town, development of a greenhouse gas emission reduction target,	

Town of Becket Hazard Mitigation Plan Update

	and identification of feasible actions to meet the target. The plan would expand upon the town's Green Community Program energy reduction plan which focuses only on municipal energy use. This could include, for example, adding electric vehicle charging stations, expanding clean energy generation, and weatherization of buildings. [Resilience, All vulnerabilities]	
Medium	Responsible Party	Community Preservation Committee
	Problem Addressed	Greenhouse Gas Emissions
	Potential Partners	
	Cost Estimate	Low
	Possible Funding Sources	Green Communities/Town?
	Timeline	August 2020 - July 2025
	Hazards	Average/Extreme Temperatures, Extreme Weather, Flooding, Drought,
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Infrastructure
26	Camp Partnerships	
Action Description	Partner with camps and other local organizations to educate them about the value in conservation, alternative energy sources and renewables. Explore the opportunities these organizations may have to act as shelters during a disaster.	
Medium	Responsible Party	Community Preservation Committee
	Problem Addressed	Public Education, Emergency Shelters
	Potential Partners	Camps/businesses
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	March 2021- August 2024
	Hazards	All Hazards

Town of Becket Hazard Mitigation Plan Update

	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Society
27	Senior Outreach	
Action Description	Expand outreach to seniors and include a system of interviewing seniors to understand their needs related to climate resilience and hazard mitigation. Collaborate with Age-Friendly Berkshires.	
Medium	Responsible Party	Council on Aging
	Problem Addressed	Public Education, Vulnerable Populations
	Potential Partners	COA/AFB
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	March 2021- August 2024
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Society
28	Incorporate Education	
Action Description	Incorporate educational efforts into all other climate resilience actions to encourage alignment of public and private efforts [Resilience]	
Medium	Responsible Party	Town Administrator
	Problem Addressed	Public Education
	Potential Partners	
	Cost Estimate	Very Low

Town of Becket Hazard Mitigation Plan Update

	Possible Funding Sources	Town
	Timeline	March 2021- August 2025
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Society
29	Stormwater Management Bylaw	
Action Description	Explore adoption of a Stormwater Management Bylaw to address stormwater impacts of development in Becket [Flooding] [Ecosystem Change]	
Medium	Responsible Party	Planning Board
	Problem Addressed	Bylaw, Storm Flooding
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2024
	Hazards	Flooding, Hurricanes/Tropical Storms,
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Environment
30	Erosion Control Bylaw	
Action Description	Explore adoption of an erosion control and sedimentation bylaw to ensure best practices are used when sites are disturbed [Ecosystem Changes]	
Medium	Responsible Party	Planning Board
	Problem Addressed	Bylaw, Erosion, Landslide

Town of Becket Hazard Mitigation Plan Update

	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2024
	Hazards	Flooding,
	Critical Facility Protection	No
	Type of Mitigation Action	Local Plans and Regulations
	MVP Community Component	Environment
31	Ecological Landscaping	
Action Description	Promote ecological landscaping [Ecosystem Changes]. Install demonstration projects on town owned land. Amend zoning bylaw to include requirements for ecological landscaping. Conduct educational efforts about ecological landscaping, especially within areas under the jurisdiction of the conservation commission.	
Medium	Responsible Party	Conservation Commission
	Problem Addressed	Erosion, Biodiversity
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	August 2020 - September 2025
	Hazards	Flooding,
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Environment
32	Youth Volunteers	

Town of Becket Hazard Mitigation Plan Update

Action Description	Continue to involve youth and local volunteers in ecological restoration initiatives - vegetation for erosion control, pollinator gardens, stream cleanup, etc. [Ecosystem Changes]	
Medium	Responsible Party	Conservation Commission
	Problem Addressed	Outreach, Ecosystem Restoration
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2023
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Environment
33	Green Infrastructure	
Action Description	Communicate with MassDOT regarding road salt application requirements for sensitive environmental areas, to utilize green infrastructure in road maintenance, and to minimize risk to flooding and landslide along Route 20.	
Low	Responsible Party	Highway Department
	Problem Addressed	Road Salt Contamination, Roadway flooding, Landslide
	Potential Partners	MASSDOT
	Cost Estimate	Very Low
	Possible Funding Sources	N/A
	Timeline	October 2020 - September 2021
	Hazards	Flooding,
	Critical Facility Protection	No

Town of Becket Hazard Mitigation Plan Update

	Type of Mitigation Action	Structure and Infrastructure
	MVP Community Component	Infrastructure
34	Council on Aging	
Action Description	Work with the Council on Aging and Age Friendly Berkshires to identify vulnerable residents and provide them with hazard mitigation and preparedness information.	
Low	Responsible Party	Council on Aging
	Problem Addressed	Vulnerable Populations
	Potential Partners	COA/AFB
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	August 2020 - July 2022
	Hazards	All Hazards
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Society
35	Road Maintenance	
Action Description	Continue to utilize best management practices for roads adjacent to sensitive aquatic areas, including road salt treatment. Continue to work with others who maintain roads in Becket to ensure they are using best practices. [Ecosystem Changes]	
Low	Responsible Party	Highway Department
	Problem Addressed	Road Salt Contamination,
	Potential Partners	
	Cost Estimate	Low
	Possible Funding Sources	Town
	Timeline	September 2020 - August 2023

Town of Becket Hazard Mitigation Plan Update

	Hazards	Flooding
	Critical Facility Protection	No
	Type of Mitigation Action	Structure and Infrastructure
	MVP Community Component	Environment
36	Beaver Deceivers	
Action Description	Continue use of beaver deceivers [Flooding]	
Low	Responsible Party	Highway Department
	Problem Addressed	Flooding
	Potential Partners	
	Cost Estimate	Very Low
	Possible Funding Sources	Town
	Timeline	August 2020 - July 2025
	Hazards	Dam Failure, Flooding
	Critical Facility Protection	No
	Type of Mitigation Action	Natural Systems Protection
	MVP Community Component	Environment
37	Fire Safety	
Action Description	Promote fire safety to all trail users.	
Low	Responsible Party	Fire Department
	Problem Addressed	Fire Safety
	Potential Partners	

Town of Becket Hazard Mitigation Plan Update

	Cost Estimate	Very Low
	Possible Funding Sources	Grant/Town Funds
	Timeline	September 2020 - August 2023
	Hazards	Drought, Wildfire
	Critical Facility Protection	No
	Type of Mitigation Action	Education and Outreach
	MVP Community Component	Environment

System to Integrate this Plan with other Planning Mechanisms

C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))

In comparison to the implementation of the previous plan, this plan will be implemented and integrated throughout Town government. The Town Administrator and the Core Team are committed to integrating this plan with the other aspects of Town government because they understand the value of hazard mitigation. They have actively participated in the planning process. They previously did not recognize the full value of a hazard mitigation plan and many had never heard of the SRPEDD plan. The Town has recently been awarded Complete Streets funding and will use it and other infrastructure projects as an opportunity to adapt to climate change and current and expanding hazards.

The Core Team identified Town plans, policies, procedures, and projects as well as other Town government activities as ways to integrate the hazard mitigation plan. They intend to do this throughout the five-year implementation timeframe of this plan. Some specific ways to integrate mitigation actions that the Core Team identified include:

- Assigning implementation of some mitigation actions to Town committees, such as the Stormwater Committee. This Committee consists of Town employees and volunteers who represent many public and private sectors.
- Collaboration with other public and private businesses such as SRPEDD, MassDot, and Dighton Water District.

Town of Becket Hazard Mitigation Plan Update

Possible funding sources

Federal Emergency Management Agency (FEMA) Mitigation Grants⁶⁸

FEMA administers three programs that provide funding for eligible mitigation planning and projects that reduces disaster losses and protect life and property from future disaster damages. The three programs are the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) Program, and the Pre-Disaster Mitigation (PDM) Program.

- [HMGP](#) assists in implementing long-term hazard mitigation planning and projects following a Presidential major disaster declaration
- [PDM](#) provides funds for hazard mitigation planning and projects on an annual basis
- [FMA](#) provides funds for planning and projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis

HMGP funding is generally 15 percent of the total amount of federal assistance provided to a state, territory, or federally-recognized tribe following a major disaster declaration. PDM and FMA funding depends on the amount congress appropriates each year for those programs.

Individual homeowners and business owners may not apply directly to FEMA. Eligible local governments may apply on their behalf.

Building Resilient Infrastructure and Communities (BRIC)

Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes and territories, as they undertake hazard mitigation projects reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program and is a result of amendments made to Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) by Section 1234 of the Disaster Recovery Reform Act of 2018 (DRRA).

The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

The Building Resilient Infrastructure and Communities (BRIC) program aims to categorically shift the federal focus away from reactive disaster spending and toward research-supported, proactive investment in community resilience. FEMA anticipates BRIC funding projects that demonstrate innovative approaches to partnerships, such as shared funding mechanisms, and/or project design. For example, an innovative project may bring multiple funding sources or in-kind resources from a range of private and public sector stakeholders or offer multiple benefits to a community in addition to the benefit of risk reduction.

⁶⁸ <https://www.fema.gov/hazard-mitigation-assistance>

Town of Becket Hazard Mitigation Plan Update

Through BRIC, FEMA will continue to invest in a variety of mitigation activities with an added focus on infrastructure projects, and community lifelines.

BRIC is anticipated to be fully released in the fall of 2020.

Municipal Vulnerability Preparedness Action Grants⁶⁹

The MVP Action Grant offers financial resources to municipalities that are seeking to advance priority climate adaptation actions to address climate change impacts resulting from extreme weather, sea level rise, inland and coastal flooding, severe heat, and other climate impacts.

Responses to the RFR may be submitted by municipalities who have received designation from the Executive Office of Energy and Environmental Affairs (EEA) as a Climate Change Municipal Vulnerability Preparedness (MVP) Community (“MVP Community”). All projects are required to provide monthly updates, project deliverables, a final project report, and a brief project summary communicating lessons learned. The municipality is also required to match 25% of total project cost using cash or in-kind contributions. All proposals must include the following:

- Completed application template
- Project budget and deliverables
- MVP yearly progress report describing any relevant work toward advancing community priorities since earning MVP designation
- Statement of match
- Letters of support from landowner (if applicable), partners, and the public

Project types include:

- **Detailed Vulnerability and Risk Assessment** – In-depth vulnerability or risk assessment of a particular sector, location or other aspect of the municipality.
- **Public Education and Communication** – Projects that increase public understanding of climate change impacts within and beyond the community and foster effective partnerships to develop support.
- **Local Bylaws, Ordinances, Plans, and other Management Measures** – Projects to develop, amend, and implement local ordinances, bylaws, standards, plans, and other management measures to reduce risk and damages from extreme weather, heat, flooding and other climate change impacts.
- **Redesigns and Retrofits** – Engineering and construction projects to redesign, plan, or retrofit vulnerable community facilities and infrastructure (e.g., wastewater treatment plants, culverts, and critical municipal roadways/evacuation routes) to function over the life of the infrastructure given projected climate change impacts.

⁶⁹ <https://www.mass.gov/service-details/mvp-action-grant>

Town of Becket Hazard Mitigation Plan Update

- **Energy Resilience Strategies** — Projects that incorporate clean energy generation and that are paired with resilience enabling technology to maintain electrical and/or heating and cooling services at critical facilities.
- **Chemical Safety and Climate Vulnerabilities** — Projects that seek to engage the business and manufacturing community through assistance or training on identifying vulnerabilities to chemical releases due to severe weather events, reducing use of toxic or hazardous chemicals, outreach to improve operations and maintenance procedures to prevent chemical releases and accidents, outreach to improve emergency and contingency planning, and/or identifying existing contaminated sites that pose chemical dispersion risks during flood events.
- **Nature-Based Storm-Damage Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques** — Projects that utilize natural resources and pervious surfaces to manage coastal and inland flooding, erosion, and other storm damage, such as stormwater wetlands and bio-retention systems, and other Smart Growth and Low Impact Development techniques.
- **Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality** — Projects that utilize natural resources, vegetation, and increasing pervious surface to reduce ambient temperatures, provide shade, increase evapotranspiration, improve local air quality, and otherwise provide cooling services within the municipality.
- **Nature-Based Solutions to Reduce Vulnerability to other Climate Change Impacts** — Nature-based projects that address other impacts of climate change such as extreme weather, damaging wind and power outages, and increased incidence of pests and vector-borne illnesses and other public health issues.
- **Acquisition of Land to Achieve a Resiliency Objective** — Land purchases are eligible for grant funding if the parcel has been identified through a climate vulnerability assessment as an appropriate location for a specific eligible adaptation activity to occur, such as accommodating an infrastructure or facility redesign or retrofit project, providing natural flood storage to reduce downstream flooding, or removal of pavement and planting of trees to reduce flooding and heat island effects.
- **Ecological Restoration and Habitat Management to Increase Resiliency** — Projects that repair or improve natural systems for community and ecosystem adaptation, such as right-sizing culverts, dam removal, restoration of coastal wetlands, etc.
- **Subsidized Low Income Housing Resilience Strategies** — Investments in resiliency measures for affordable housing to protect vulnerable populations that may not have the resources to recover from an extreme climate event.
- **Mosquito Control Districts** — Projects to reduce the risk to public health from mosquito-borne illness and to increase mosquito surveillance and control capacity by incentivizing municipalities not in an organized mosquito control project or district to form a new mosquito control district or join an existing mosquito control district. Also funding for municipalities currently in a mosquito control district for new or proactive mosquito control measures.

Additional Grant Sources

Massachusetts Clean Energy Center (MassCEC) Clean Energy and Resiliency (CLEAR) Grant Program

CLEAR is seeking groups interested in participating in an energy resiliency needs analysis and system design study for their community. A requirement of the program is that community applicants must

Town of Becket Hazard Mitigation Plan Update

apply under one of two categories: (1) municipalities, who must have participated in the MVP program; or (2) non-municipal communities, who must designate a lead organization, such as a business or non-profit, and whose facilities proposed for study must be located within a municipality that participated in the EEA MVP program. MassCEC seeks to support community resiliency efforts that reduce GHG emissions, enable the integration of renewable energy sources, and provide energy resilience for critical facilities during electrical grid outages. The feasibility studies awarded under CLEAR will ideally support energy resiliency projects which empower community leaders, foster public-private partnerships, protect vulnerable populations, complement planned or existing district thermal systems, and integrate Massachusetts-based technology. Additional information regarding the Community CLEAR EOI can be found [here](#) and the EOI can be found [here](#). The deadline for applications is March 31, 2020.

Section 319 Nonpoint Source Pollution Competitive Grants Program

Section 319 of the Clean Water Act of 1987 established a national program to control nonpoint sources (NPS) of pollution. Each year the Massachusetts Department of Environmental Protection issues a Request for Responses (RFR) for competitive projects to be funded through Section 319 grants. This year's RFR is anticipated to be issued on or about April 2, 2020. Proposals will be due on or about June 4, 2020. The RFR will be announced via COMMBUYS, the Commonwealth's procurement site. The RFR will be posted at the [MassDEP website here](#), where you can also find more information about grant eligibility, project types, contact information etc.

Massachusetts Office of Coastal Zone Management (CZM) Coastal Pollutant Remediation (CPR) Grants

The [CPR Grant Program](#) provides funds to municipalities within the [Massachusetts Coastal Watershed](#) to identify and improve water quality impaired by nonpoint source (NPS) pollution. Funding can be used for water quality assessment, design and construction of structural Best Management Practices (BMPs), and commercial boat-waste pumpout facilities. In addition, funding is available to support capacity-building activities and planning for stormwater infrastructure, such as the development of bylaws and ordinances and training for municipal staff on operation and maintenance. *CZM anticipates the release of the Fiscal Year (FY) 2021 Requests for Responses (RFR) for this grant program this spring. Prior to the release of the RFR, CZM will host information sessions to discuss goals and requirements, answer questions, and provide feedback on potential project ideas for this grant.*

Massachusetts Office of Coastal Zone Management (CZM) Coastal Resilience Grants

The [Coastal Resilience Grant Program](#) provides funding and technical assistance to reduce risks associated with coastal storms, flooding, erosion, and sea level rise through innovative and transferable local projects. Coastal communities are eligible to apply for funding to assess vulnerabilities and risks and redesign and retrofit vulnerable, municipally owned facilities and infrastructure. Additionally, both coastal communities and eligible nonprofit organizations may seek funding for public education and communication efforts to conduct proactive planning to address sea level rise impacts and implement non-structural (or green infrastructure) approaches that enhance natural shoreline resilience and provide coastal storm damage protection. *CZM anticipates the release of the Fiscal Year (FY) 2021*

Town of Becket Hazard Mitigation Plan Update

Requests for Responses (RFR) for this grant program this spring. Prior to the release of the RFR, CZM will host information sessions to discuss goals and requirements, answer questions, and provide feedback on potential project ideas for this grant.

Massachusetts Division of Ecological Restoration Culvert Replacement Municipal Assistance Grants

The Division of Ecological Restoration (DER) is seeking proposals from Massachusetts municipalities interested in replacing an undersized, perched, and/or degraded culvert located in an area of high ecological value. The total funding anticipated to be available in FY21 is \$750,000-\$1,500,000. Funding is to encourage municipalities to replace culverts with better designed crossings that meet improved structural and environmental design standards and climate resiliency criteria. Only projects that intend to meet the goals of the Massachusetts Stream Crossing Standards will be considered for funding. Use of these Standards to design culverts improves river function and access for fish and wildlife, and reduces hazards to public safety, such as flooding, culvert failure, and road washout. Massachusetts municipalities are eligible to apply for funding to support advancing one culvert replacement project toward completion. *New for Fiscal Year 2021 - Municipalities may elect to also be considered for status as one of DER's Culvert Replacement Training Sites. Training sites receive additional technical assistance and are eligible for funding until project completion. Additional eligibility requirements apply.* Interested communities should view the full announcement, including funding, eligibility and evaluation criteria, on DER's website: <https://www.mass.gov/how-to/culvert-replacement-municipal-assistance-grant-program>. The application deadline is 5PM, March 25, 2020.

Chapter 7. Keeping the Plan Current

Continued Public Participation

A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))

Public participation is an integral component of the mitigation planning process and will continue to be essential as this plan is implemented and updated over time. Becket residents eagerly participated in the MVP and Hazard Mitigation Planning processes. The Core Team developed multiple education and outreach mitigation actions designed to engage the public. The Town plans to involve the public throughout the five-year implementation of this plan, as well as in the review and update process. The Town Administrator's Office will take the lead in soliciting participation from the public. This participation will take multiple forms, including all of those outlined in the Planning Process Chapter of this plan. Efforts to involve the public include:

- Advertising on the Town's website, and via flyers and press releases.
- Private sector representatives, specifically those representing camps and other businesses, will join Town officials in implementing mitigation actions.

Town of Becket Hazard Mitigation Plan Update

- Copies of this plan will remain on the Town's website, and a hard copy will be kept at the Town Hall for public review. Updates to the plan will also be posted on the Town's website.
- The Town of Becket will continue to work with private industry, regional agencies, and adjacent communities as this plan is implemented.

Method and Schedule for Keeping the Plan Current

A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

The Core Team and the Town of Becket recognize the importance of keeping the mitigation plan up to date. Keeping the plan current includes monitoring, evaluating, and updating the plan over a five-year period, a process led by the Town Administrator. The Town Administrator has the support of the Core Team and the Emergency Management Director.

The Core Team has agreed to the following procedures to keep the plan current.

- The overall responsibility for monitoring the implementation of the plan rests with the Town Administrator. The Town Administrator will maintain the Mitigation Action Tracker and the Excel-based spreadsheet that functions as a database of all mitigation actions. The Town Administrator will send a reminder email with a link to the web-based Mitigation Action Tracker on a quarterly basis to all Department Heads responsible for a mitigation action. The Town Administrator may also distribute the Mitigation Action Progress Worksheet (shown in Appendix D) for Department Heads who prefer a form to the Mitigation Action Tracker. The Mitigation Action Tracker is a tool to facilitate recording the status of all mitigation actions.
- If the Town experiences a large-scale disaster, the Town Administrator will assemble a Core Team meeting to update the list of mitigation actions and review the order of priorities. The Core Team has agreed to meet on a semi-annual basis to review the implementation of the mitigation plan. The first meeting will take place in January; the second, in July.
- At the first meeting in January 2021, the Core Team will review the effectiveness of the planning process, public and stakeholder engagement, risk analysis, and the mitigation strategy, including its implementation. It is recommended that the Core Team use the worksheet provided in Appendix D.
- At each semi-annual meeting, the Core Team will review the plan's goal statements and mitigation action status. If necessary, the goal statements and mitigation actions may be revised to reflect current Town priorities. In addition, the Core Team will discuss methods for continuing to integrate the mitigation plan with other plans, processes, and projects in the Town.

Town of Becket Hazard Mitigation Plan Update

- The Town Administrator will prepare a one-page brief regarding the January Core Team meeting to share with the Town the town's website. The Core Team and the Town Administrator recognize the value in keeping the public informed about the implementation and status of the mitigation plan.
- Core Team members will continue to participate in regional and state-based meetings in an effort to stay current with best practices for mitigating risk. These meetings may include those with the Massachusetts Emergency Management Agency (MEMA), the Berkshire Regional Planning Commission (BRPC), and the MA Department of Conservation and Recreation.
- The Town of Becket agrees to update and adopt this mitigation plan on a five-year basis. This update will include a comprehensive review and planning process similar to the one used to develop this mitigation plan update. It will include updating land use practices, collecting and reviewing best available data, reviewing the capability assessment, engaging the public and relevant stakeholders, and updating the mitigation action list. This process will occur according to FEMA guidelines. The Core Team will seek funding for the development of the plan update a year before the plan expires. The plan update process gives the Town the chance to add and/or re-prioritize mitigation actions based on current risk, capabilities, and public/stakeholder suggestions. The Town Administrator will serve as the Project Manager for the update process.

Town of Becket Hazard Mitigation Plan Update

Responsible Parties for Plan Implementation and Maintenance

William Caldwell, Town Administrator

Address: Town Hall, 557 Main Street, Becket, MA 01223

Phone: 413-623-8934

Website: www.townofbecket.org

Kristopher McDonough, Emergency Management Director

Address: Town Hall, 557 Main Street, Becket, MA 01223

Phone: 413-623-6010

Website: www.townofbecket.org

For state resources, contact the Massachusetts Emergency Management Agency:

Address: 400 Worcester Road, Framingham, MA 01702-5399

Phone: 508-820-2000 (MEMA Headquarters and Communications Center) or 978-328-1500 (MEMA Region 1 Office)

Website: <https://www.mass.gov/orgs/massachusetts-emergency-management-agency>

For federal resources, contact the Federal Emergency Management Agency:

Address: 99 High Street, Boston, MA 02110

Phone: 877-336-2734

Email: fema-r1-info@fema.dhs.gov

Website: <https://www.fema.gov/region-i-ct-me-ma-nh-ri-vt>

Town of Becket Hazard Mitigation Plan Update

Appendix

Appendix A: Planning Process Supporting Materials

Core Team Meeting 11/25/2019

BECKET MUNICIPAL VULNERABILITY PREPAREDNESS PLAN/HAZARD MITIGATION PLAN UPDATE, PHASE 1

Core Team Meeting, November 25, 2019

Meeting Objectives

- Develop a shared understanding of MVP/HMP process and goals
- Plan Project
- Prepare for Workshop

Agenda

Introductions (5 minutes)

Intro to MVP Planning Process. Presentation and Discussion (10 minutes)

Intro to HMP planning process. Presentation and Discussion (10 minutes)

Review Project Plan (10 minutes)

Set Becket's Priorities for MVP (15 minutes)

Workshop Invite List and Outreach (20 minutes)

Review Map and Identify Critical Facilities (20 minutes)

Identify Next Steps (5 minutes)

- Core Team provides relevant past reports, anecdotes, photos, videos, etc.
- D&F revises invitation letter and flyer, as needed.
- Meredyth sends out invitation and flyer
- Core Team follow up with personal invitations to Workshop
- D&F and Jamie Caplan prepare for workshop

Note: Times are approximate guidelines. Meeting is expected to be about two hours.

Town of Becket Hazard Mitigation Plan Update

BECKET MYP/HMP CORE TEAM MEETING
SIGN IN SHEET 11/25/2019

Name	Contact Info (email/phone)	Affiliation and/or Address
Jamie Caplan	jamie@jamiecaplan.com 413-586-0867	Jamie Caplan Consulting
William Caldwell	administration @ townofbecket.org	Town Administration
Raj Ferlin	ambulance @ townofbecket.org	Ambulance director
Cindy Delapape	cdbecket@gmail.com	HMP Committee
Kris McDonough	chief@townofbecket.org	Police Chief
Maria Wellington	maria235@gmail.com	core group
CHRIS Swindlehurst	413-822-5686 chrisswindlehurst@gmail.com	selectman
Chris Bouchard	highway @ town of becket.org	highway Supt
Meredith Bahaud	coordinator Core Team meredith Bahaud	
David Johnson	ATAINCDAI @gmail.com	Conservation Commission
Alison Dixon	adixon@hvatoday.org	Cons. Comm.

Town of Becket Hazard Mitigation Plan Update

Core Team Meeting 1/27/2020

CORE TEAM MEETING SIGN-IN SHEET			
Project:	Becket MVP and HMP	Meeting Date:	1/27/2020
Facilitator:	Jamie Caplan	Place/Room:	Town Hall
Name	Affiliation/Company	Phone	E-Mail
William Childwell	Town of Becket	623-8934	admin@townofbecket.org
Chris Swindlehurst	Town of Becket	413-822-5686	chris@swindlehurst.com
Jim Peters	Becket	860-967-4928	JSP3100@gmail.com
Meredith Babcock	Becket	413-623-2070	meredithbabcock@att.net
Maria Wallington	Becket	413-344-3023	maria235@gmail.com
Alison Dixon	Becket/HVA	413-623-8797	adixon@hva-bd.org
Andy Delapena	Becket	413-623-9016	ad@becket.org
Ray Ferrin	Becket Ambulance	413-623-5011	Ray@townofbecket.org
Kris McDonough	Chief of Police EMD	413-623-6010	chief@townofbecket.org
Chris Bouchard	Highway Supt		highway@townofbecket.org
Jamie Caplan	Consultant	413-586-0867	jamie@jamiecaplan.com

Please join us for the

Becket Municipal Vulnerability Preparedness (MVP) Workshop

Be part of proactive planning for climate change in Becket!

When: Saturday, January 11, 2020

Snow date: January 25, 2020

All-day, invitation-only workshop beginning at 9 am

Lunch will be provided!

Location: TBD

Massachusetts is actively funding climate change planning and adaptation projects in communities across the state. What are your biggest concerns about climate change? How can you and your neighbors be prepared?

Join community members and a team of planners to identify Becket's strengths and vulnerabilities, and brainstorm solutions to help your community prepare for climate change. We need your input to make Becket more resilient!

Please RSVP to **mvp@townofbecket.org** or by calling (413) 623-2070

We hope to see you there!

Town of Becket Hazard Mitigation Plan Update

CRB Workshop Agenda



WORKSHOP AGENDA FOR FACILITATORS

Becket Municipal Vulnerability Preparedness (MVP) Plan/Hazard Mitigation Plan
January 11, 2020

9:00 AM Refreshments and Welcome

Welcome by Chris Swindlehurst(?)
Welcome by Meredyth Babcock
Introduce Core Team
Introduce Dodson & Flinker team

9:15 AM Introductory presentation

Presentation includes info about workshop purpose and process, introduce core team.
summary of climate change data, summary of past related planning in Becket, introduce map

9:45 AM Large group discussion: Identify past, current, and future hazards

10:00 AM Small group discussions: Determine top-priority hazards

Introductions, Roles, Clarifications:

- Quickly ask each participant to say name & affiliation.
- Identify Scribe. Scribe's role is to take general notes. Facilitator will fill in matrix.
- Identify Small Team Spokesperson for Report Out.
- Address any clarifying questions of overall task – risk matrix and base maps.

Instructions:

Begin small team discussion. Discuss the **top hazards for the community and list them in the Hazards column on the Risk Matrix.** (Step B in facilitator guide)

Questions:

Our discussion just identified the following hazards _____. Do you agree? Are there other Hazards we should consider?

- What Hazards have impacted your community in the past? Where, how often, and in what ways?
- What hazards are impacting your community currently? Where, how often, and in what ways?

Town of Becket Hazard Mitigation Plan Update



- What have been the impacts to the town's operations and budgets, planning and mitigation efforts?
- How might climate change shift which hazards are most common or impactful?
- What effects will these hazards/changes have on your community in the future (5, 10, 25 years)? What is exposed to hazards and climate threats within your community?
- Do you have other concerns or considerations related to impacts?

10:30 AM Break—10 minutes, then return to small groups

10:40 AM Small group discussions: Identify community vulnerabilities and strengths (infrastructural, societal, environmental)

Instructions:

- (Step C in CRB Guide) - Begin in first row/column of sector (i.e., infrastructure, societal, environmental) and identify vulnerability (e.g., a certain town building, a particular group of people, a specific wetland) and strengths (e.g., new Emergency Operation Center, generators, large protected floodplain).
- Determine location of vulnerability/strength. Mark on Base Map and list on Risk Matrix.
- Identify ownership of issue or place.
- Identify if feature/asset is a strength and/or vulnerability.

Remember what gets written on the Risk Matrix needs to be identified on the Base Map via participatory mapping.

Discussion Questions

Identify Infrastructural Vulnerabilities and Strengths

- What infrastructures/facilities are exposed to current and future hazards?
For example: culverts, DPW facility, dams, houses in floodplain on east side of Long Bow Lake?
- What makes this infrastructure vulnerable?
For example: location, condition, design or construction inadequacy, etc?
- What are the consequences of this infrastructure being vulnerable?
For example, a culvert blowout could destroy a road that provides emergency access

Identify Societal Vulnerabilities and Strengths



- What are the population characteristics of people living in high-risk areas? Elderly, low/moderate income, special needs, languages spoken?
- What are the social or cultural strengths and of people in your community? Which groups are active and connected? For example, are there active civic groups, organizations, associations?
- How effective are emergency services? Are there strong lines of communication for emergency information?
- Does the community rally behind people in need? Does it bounce back quickly from challenges?
- How effective is town governance now? Does the Town have the resources and capability to prepare for climate change and natural hazards?
- How might climate change impact who lives in Becket?
- How might climate change impact the economy of Becket?
- How might climate change impact that functioning of the Town government?
- How might climate change and hazards intensify the Town's social strengths and weaknesses? Where are areas for improvement in your community?

Identify Environmental Vulnerabilities and Strengths

- What natural resources are important to your community?
- What benefits do these natural resources provide.
For example, moderate temperature, absorb rain, wildlife habitat, erosion control, water quality improvement, slope stabilization, recreation?
- What have been the past effects of hazards and climate change on these natural resources?
- Which natural resources are exposed to climate change and current and future hazards?
- Where are the high-risk areas and what vulnerabilities exist for the environment?
- Which natural resources are likely to be most resilient to climate change?
- How might climate change impact development in your town and how would that impact environmental features?
- Which environmental assets are most important to protect for the future?
- Which environmental assets can be harnessed to make Becket more resilient?

12:00 PM Lunch

12:45 PM Large group discussion: takeaways from the morning, integrating climate resilience into town planning

Town of Becket Hazard Mitigation Plan Update



Questions:

- What were the key themes from your small group discussions?
- Which hazards did you focus on? Why?
- Which strengths and vulnerabilities felt most important? Why?
- Thinking broadly, and forgetting about climate change for the moment, what are the key issues in Becket now?
- What do you think the key issues will be in 20 years? How does climate resilience fit into that?

1:00 PM Action Planning: Presentation and Brief Discussion

[Give instructions again before breaking up into groups]

1:20 PM Resume small group discussions: identify and prioritize community actions

Instructions:

Identify and prioritize actions for each category—Infrastructure, Society, Environment
For each Action:

- name the Action
 - identify which Hazards are relevant
 - specify the Time required to complete the action (Short-term, Long-term, Ongoing)
 - identify its priority level (High, Moderate, Low).
- Discuss: is it a nature-based solution, potential funding sources, strength and breadth of potential mitigation impact of the action, what co-benefits would the action have, does the action advance Becket's longer-term goals; are there synergies with other local, regional or state objectives?

2:30 PM Break—15 minutes then return to small groups

2:45 PM Continue small group discussion

- Finish identifying and prioritizing community actions
- Clean up matrix as needed
- Revisit Prioritization of Actions
- Decide on top 3-5 Actions. Write each priority action on a separate blank piece of paper
- Prepare for report out

3:15 PM Large group Activity: Report Out (5 minutes per group)
Each small group briefly summarizes their key takeaways

Town of Becket Hazard Mitigation Plan Update



posts their top 3-5 actions on the wall and explains them

3:45 PM Large Group Activity: Agree on 3-5 Highest Priority Resilience-building Actions for Becket

Questions:

- What are the Commonalities, Differences among the top actions?
- Can any be grouped?

D&F shuffle papers posted to wall to group them

- Do the groupings make sense? Do they capture your discussions?
- Do the groupings address Infrastructural, Societal, and Environmental strengths and vulnerabilities? Do they clearly relate to your top hazards?
- Are there any top priority actions that are missing that really should be on the wall?
D&F writes any on other pieces of paper and sticks to wall.
- Ask for nominations for top 3-5 actions with an explanation for why? Star those items.
Ask 2 or 3 times for top actions.
- Do temperature check for each starred item (raise hand if you agree—but don't count yet).
- Summarize level of support for each item then invite argument for or against priorities identified.
- Do temperature check again. If clear winners, name them and confirm with group. If not, do dotting exercise (5 dots, can put all on one item or spread them out).]

4:30 PM Large group discussion: Next Steps for Resilience Actions

4:45 PM Final comments

Last comment by Becket VIP (by Chris Swindlehurst, other Select Board Member, or other Core Team member--Decide ahead of time)

5:00 PM Workshop Ends

Town of Becket Hazard Mitigation Plan Update

MVP Mini Session Sign-in Sheets

Becket Town Hall MVP.jpg

5/10/20, 2:23 PM

Sign-In

check if interested

^{past history}
Al Blake

TOMMIE Hutto-BIARE

Shelley Chandler ✓

Julia McKay-Grace ✓

ROBB GRACE

STEVE ROSENTHAL

Arthur Alpo ✓

Maria Wallington ✓

Beet Berot bertberot@gmail.com ✓

Michael Lavery

Frank Tolopko Otis

James Schaefer Reg COOR MVP ✓

* CARLENE Petrit ← ✓

Barb Wacholder ✓

Neil F Toomey

Ann Krauselt

David Edgecomb

James S. Peters

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Page 1 of 1

Town of Becket Hazard Mitigation Plan Update

Athenaeum mini MVP.jpeg

5/10/20, 2:23 PM

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Page 1 of 1

Town of Becket Hazard Mitigation Plan Update

Sherwood Forest mini mvp list.png

5/10/20, 2:23 PM

Summary		
Date(s) of Service	Organization/Agency/Club	Overall Tasks Accomplished
Nov 23rd	Becket MVP Workign group	Share process and map
Volunteer Timesheet		
Date	Name	Tasks Accomplished
	Susan Purser	Lerned about MVP process
	Robert Ronzio	Lerned about MVP process
	Howard Lerner	Lerned about MVP process
	Bill Babcock	Lerned about MVP process
	Don Munger	Lerned about MVP process
	Robert Grace	Lerned about MVP process
	Julie Grace	Lerned about MVP process
Total		
Signature of Project		
Date		

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Page 1 of 1

Hazard Mitigation & Municipal Vulnerability Planning Becket's Community Listening Session

The Town of Becket is in the process of updating our Hazard Mitigation Plan. The Hazard Mitigation Plan is being developed in conjunction with the Municipal Vulnerability Preparedness project, both require a lively dynamic listening session.

The Hazard Mitigation Plan will be submitted to the Federal Emergency Management Agency (FEMA) for their review and approval. The plan serves as an essential strategy for reducing current and future risks to natural hazards by identifying projects to minimize those risks.

A [Draft of the Municipal Vulnerability Plan](#) is available for community members to review from May 8th until the 29th when comments sent to MVP@townofbecket.org will be reviewed and a determination will be made, by the MVP core team, if changes and/or amendments should be made in lieu of comments and listening session contributions.

The Town's official listening session will be held Monday May 18th. From 6:30 - 8:30 pm. Eastern Time. Join Zoom Meeting [LINK Becket's Listening Session](#) Meeting ID: 926 2400 6241 / Password: 566230 - Joining the meeting via the web is preferred. Poll questions & chat box will be live during the Zoom meeting. If you chose to dial in please use: 1 929 205 6099

FEMA approval and Town adoption of the Hazard Mitigation Plan allows the Town to apply for pre- and post-disaster hazard mitigation grant funds. The adoption of our Municipal Vulnerability Plan makes Becket eligible for MVP Action grants. Let us know if you are interested in working on the grant preparation/writing. Help us show that Becket residence care and want to plan for our changing climate, incorporate nature-based solutions and work collaboratively to enhance and preserve that make Becket unique.

**PLEASE SPREAD THE WORD ABOUT THIS OPPORTUNITY TO PERFECT OUR
MUNICIPAL VULNERABILITY PLAN AND REVIEW OUR HMP UPDATE.**

Town of Becket Hazard Mitigation Plan Update

Becket Listening Session Zoom Meeting Attendees

JC	Jamie Caplan (Co-host)		
M	merdythbabcock (Co-host)		
AJ	A. J. Pietrantone		
AL	Adele Levine		
AP	Amy Perlmutter		
CP	Carrieanne Petrik		
CS	Chris Swindlehurst		
CD	Cindy D		
	Crispina ffrench		
H	howard		
J	jamespeters		
JR	Janice Rosenman		
J	juliagrace		
L	Linda Burt		
	Marc Schultz		
MW	Maria Wallington		
MJ	Michael Jastremski		
SP	Susan P		
W	wjcaldwell		
	1413****396		
	1413****396		

Housatonic Valley Association: Planning for Flood Resilient and Fish-Friendly Road-Stream Crossings, Project Fact Sheet 02/2020



Planning for Flood Resilient and Fish-Friendly Road-Stream Crossings

Project Fact Sheet 02/2020

Summary: The Housatonic River watershed spans 3 states, 83 towns, and 1,948 square miles. Within the watershed, there are thousands of points where roadways, driveways, and trails cross rivers and streams. In these locations the road is carried by structures collectively referred to as **road-stream crossings** (i.e., culverts and bridges).



Initial results of an ongoing study conducted by the Housatonic Valley Association (HVA) indicate that approximately 56% of the non-bridge road-stream crossings evaluated to date in the Housatonic watershed are considered moderate or worse **barriers to fish and wildlife movement** (n = 976). Furthermore, modeling by project partners at the University of Connecticut indicates that approximately 18% of non-bridge structures evaluated fail (i.e., water over the road) in a 25-year recurrence interval flood or less (n = 594). Given the sheer number of problem structures, a strategic approach to **restoring habitat connectivity** and **reducing flood risk** at road-stream crossings is necessary.

Barrier Evaluation	Number of Culverts	Percentage
Severe barrier	225	23%
Significant barrier	97	10%
Moderate barrier	225	23%
Minor barrier	337	35%
Insignificant barrier	92	9%
No barrier (full passage)	0	0%

Recurrence of Interval Failure	Number of Culverts	Percentage
2-Year	14	2%
5-Year	10	2%
10-Year	23	4%
25-Year	61	10%
50-Year	45	8%
100-Year	50	8%
200-Year	57	10%
Passing	334	56%

In 2015, HVA began a pilot project to develop road-stream crossing management plans (RSCMPs) in 7 towns in Northwest CT; as of 2020, there are 24 plans in various stages of completion across our watershed (see map). The primary objectives of this work are to help communities identify **highest priority replacement projects** based on conservation value, flood risk and maintenance need, encourage adoption of culvert design Best Management Practices, and create a new tool for securing financing for replacement projects. In Columbia County, HVA works closely with Trout Unlimited, Columbia-Greene Cornell Cooperative Extension and the NYSDEC Hudson River Estuary Program on RSCMP development

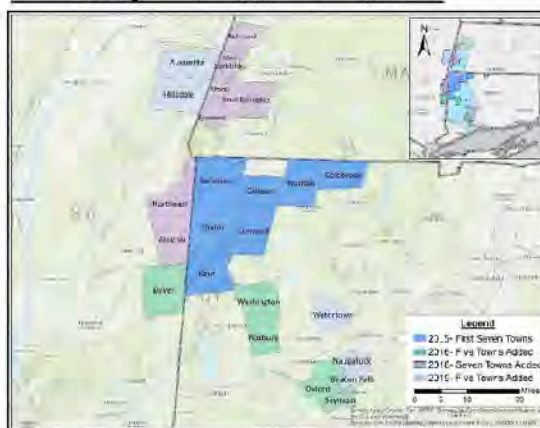


Figure 1: Towns with completed plans or plans currently in progress.

After data collection and analysis, HVA works with the towns and a Project Engineer to develop preliminary designs and implementation strategies for high-

Town of Becket Hazard Mitigation Plan Update

priority replacements and to integrate assessment results into local highway infrastructure and hazard mitigation planning. Even more important than the construction of a flagship replacement project in each town is the opportunity to show local highway managers and decision makers that the same **best management practices** that restore fish and wildlife passage also reduce flood risk and long-term maintenance costs. The impacts of climate change (i.e., more frequent extreme precipitation events, rising temperatures) will increase the risk of culvert failures, as well as increase stressors to native fish and wildlife populations. Replacing problem culverts with structures that conserve natural stream processes is a single solution that can increase the climate resiliency of both the built and natural environment.

The Road-Stream Crossing Management Planning Process:

- 1) **Assessments of all road-stream crossings within selected towns:** Assessments for fish and wildlife passage (stream habitat continuity) are conducted using the North Atlantic Aquatic Connectivity Collaborative (NAACC) protocol. Data collected in the field is uploaded to a regional online database which produces a “passability score” and barrier evaluation, ranking the site’s ability to pass fish and wildlife and ranging from 0 (complete/severe barrier) to 1 (no barrier, full passage).
- 2) **Flood Risk Analysis:** All closed-bottom structures (culverts) within each town are assessed for flood resiliency, through a collaboration with UConn Department of Civil and Environmental Engineering (UCONN), using a hydraulic capacity model that predicts failure (water overtopping the road) at various flood frequencies (2-, 10-, 25-, 50-, 100-, 200-year recurrence intervals). Flows for this analysis were derived from the Coupled Routing and Excess Storage (CREST) 3.0 hydrologic model developed by UCONN.
- 3) **Road-Stream Crossing Inventory documents:** Town-wide inventory documents are developed for partner municipalities, containing maps, photos, all data collected in the field, and barrier status for each crossing, as well as the results of UCONN’s flood-risk analysis.
- 4) **Collaborative prioritization:** Inventory documents are used to guide prioritization workshops for each town, with representatives from the Board of Selectmen, Public Works and Emergency Services as well as other key stakeholders. These meetings allow for a better understanding of distinct flood-risk issues at specific sites in each town, such as frequent flooding or sediment/debris accumulation. Replacement projects that will reduce flood risk, restore habitat connectivity in cold-water streams, and address town maintenance needs are ranked the highest.
- 5) **Preliminary designs (where funding is available):** Preliminary designs and implementation strategies for the highest priority replacement project in each town are developed in collaboration with Project Engineer. Replacement projects are designed using the Stream Simulation method, which not only preserves safe roadways and minimizes expenses associated with more frequent repair and replacement, but also serve to reconnect critical wildlife corridors for ecologically and economically important native species like Eastern Brook Trout.
- 6) **Road-Stream Crossing Management Plans:** All of the above information, along with conclusions and management recommendations, is assembled as a Road-Stream Crossing Management Plan document for each partner town. These documents are suitable for official municipal adoption as an annex to local Natural Hazard Mitigation plans.

Town of Becket Hazard Mitigation Plan Update

Benefits of the Town-Scale Approach:

- Encourages adoption of BMPs like Stream Simulation Design
 - Provides opportunities to show that BMPs lead to more resilient, less expensive structures as well as restore habitat
 - Given the large number of problem structures, a fundamental change in management philosophy is necessary
- Provides the Management Plan as a resource that can help Towns take advantage of every opportunity to replace problem structures:
 - Grant-seeking
 - Proposals for structures prioritized as part of a planning process will be more competitive
 - Capital planning
 - Plan can help make the case to elected officials and the public that priority structures should be included
 - Wake of the flood
 - Plan can help make the case to FEMA and other relief agencies that structures should be upsized and designed to conserve stream process
- Allows for the incorporation of local knowledge:
 - Town Highway, EMS and other staff and officials generally understand where their flooding issues are
 - This can reinforce and/or inform modeling results

Project Status and Results to Date:

As of February 2020, HVA has completed Road-Stream Management Plans for the first twelve towns and there are twelve more plans in progress. Initial project results indicate an overlap in local knowledge and UCONN's flood risk model results. Of all the crossings that were both ranked by town officials (as



show highway managers that there is significant overlap between flood risk and habitat issues, and that the same Best Management Practices can address both issues. Ultimately, these Road-Stream Management Plans will be tools each Town can use take advantage of every opportunity to reduce flood risk and improve stream habitat connectivity at road-stream crossings, including capital planning and regular maintenance, grant programs, and recovery operations in the wake of the next flood.

Town of Becket Hazard Mitigation Plan Update

Partner Towns:

Phase I: Canaan, Colebrook, Cornwall, Kent, Norfolk, Salisbury, Sharon
Phase II: Dover (NY), Oxford, Roxbury, Seymour, Washington Phase III (MA, NY): Alford, Amenia (NY), Egremont, Great Barrington, Northeast (NY), Richmond, West Stockbridge
Phase VI (NY, CT): Austerlitz (NY), Beacon Falls, Hillsdale (NY), Naugatuck, Watertown

Project Partners:

Towns, UConn Civil and Environmental Engineering Department, Princeton Hydro LLC, CTDEEP-Inland Fisheries, Trout Unlimited, Northwest Hills COG, Naugatuck Valley COG, NYDEC- HEP, Cornell Cooperative Extension, Aton Forest, North Atlantic Aquatic Connectivity Collaborative, Farmington River Watershed Association

Funders:

Housatonic River Natural Resource Damages Fund; National Fish and Wildlife Foundation's (NFWF) New England Forests and Rivers Fund; NFWF Long Island Sound Futures Fund; New England Interstate Water Pollution Control Commission/Hudson River Estuary Program; Patagonia World Trout Initiative; Farmington River Coordinating Committee; Connecticut Institute for Resilience and Climate Adaptation; Northwest Connecticut Community Foundation; Connecticut Community Foundation; New York State Climate Smart Communities Grant Program

For More Information:

Call or e-mail Watershed Conservation Director Mike Jastremski (mj.hva@outlook.com) or Conservation Projects Manager Lindsay Keener-Eck (lkeenerreck.hva@gmail.com) at HVA:



PO Box 28
Cornwall Bridge, CT 06754
(860) 672-6678
www.hvatoday.org



Figure 2 Before (top) and after (bottom) photo of a culvert replacement project on Churchill Brook in Pittsfield, MA. The bottom structure is an-bottomed culvert that was designed with the natural stream channel in mind.

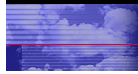


Town of Becket Hazard Mitigation Plan Update

Appendix B: Capability Assessment Supporting Materials

Community Information Sheets

3/31/2020



Home
Search
Previous Search
Community
CRS
CAC/CAV
Maps
SOS
Insurance
CAP-SSSE
CAV Selection

CIS Reports
Links
Request/Feedback

FAMS

Log Out

Insurance Pre/Post FIRM

Community Information System

Release 5.02.00.02. 01/28/2020 -- Build 009, [Skip Navigation](#) Logged in as: joyduperault [Session expires in 20 mins]

Insurance Pre/Post FIRM

As of 03/02/2020

Community:	BECKET ,TOWN OF	State:	MASSACHUSETTS
County:	BERKSHIRE COUNTY	CID:	250018

Overview	Occupancy	Zone	Pre/Post FIRM
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Pre-FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	0	\$0	\$0	0	\$0.00	\$0.00
A Zones	9	\$12,698	\$674,200	3	\$42,073.00	\$2,175.00
AO Zones	0	\$0	\$0	0	\$0.00	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00	\$0.00
V Zones	0	\$0	\$0	0	\$0.00	\$0.00
D Zones	0	\$0	\$0	0	\$0.00	\$0.00
B, C & X Zone	13	\$6,693	\$4,131,000	2	\$4,541.92	\$1,200.00
Standard	2	\$2,193	\$491,000	0	\$0.00	\$0.00
Preferred	11	\$4,500	\$3,640,000	2	\$4,541.92	\$1,200.00
Grand Total	22	\$19,391	\$4,805,200	5	\$46,614.92	\$3,375.00

Post-FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	0	\$0	\$0	0	\$0.00	\$0.00
A Zones	0	\$0	\$0	0	\$0.00	\$0.00
AO Zones	0	\$0	\$0	0	\$0.00	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00	\$0.00
V Zones	0	\$0	\$0	0	\$0.00	\$0.00
D Zones	0	\$0	\$0	0	\$0.00	\$0.00
B, C & X Zone	5	\$2,105	\$1,750,000	1	\$0.00	\$225.00
Standard	0	\$0	\$0	0	\$0.00	\$0.00
Preferred	5	\$2,105	\$1,750,000	1	\$0.00	\$225.00
Grand Total	5	\$2,105	\$1,750,000	1	\$0.00	\$225.00

<https://isource.fema.gov/cis/insurance.action?method=getPrePost>

1/1

Town of Becket Hazard Mitigation Plan Update

3/31/2020



Home
Search
Previous Search
Community
CRS
CAC/CAV
Maps
SOS
Insurance
CAP-SSSE
CAV Selection

CIS Reports
Links
Request/Feedback

FAMS

Log Out

CIS: Repetitive Loss

Community Information System

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Community Repetitive Loss

COMMUNITY : BECKET ,TOWN OF

Community	State	Regional	National			
		AE, A1-30, AO, AH, A		VE, V1-30, V	B, C, X	TOTAL
RL Buildings (Total)						
RL Buildings (Insured)						
RL Losses (Total)						
RL Losses (Insured)						
RL Payments (Total)						
Building						
Contents						
RL Payments (Insured)						
Building						
Contents						

Post - FIRM SFHA RL Buildings:

Insured Buildings with 4 or More Losses:

Insured Buildings with 2-3 Losses > Building Value:

Total Target RL Buildings:

0

<https://isource.fema.gov/cis/rloss.action?method=getRLoss&level=C>

1/1

Town of Becket Hazard Mitigation Plan Update

3/31/2020



Home
Search
Previous Search
Community
CRS
CAC/CAV
Maps
SOS
Insurance
CAP-SSSE
CAV Selection

CIS Reports
Links
Request/Feedback
FAMS
Log Out

CIS: Insurance Zone

Community Information System

Release 5.02.00.02, 01/28/2020 -- Build 009, [Skip Navigation](#) Logged in as: joyduperault [Session expires in 19 mins]

Insurance Zone

As of 03/02/2020

Community:	BECKET ,TOWN OF	State:	MASSACHUSETTS
County:	BERKSHIRE COUNTY	CID:	250018

Overview	Occupancy	Zone	Pre/Post FIRM				
	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense	
A01-30 & AE Zones	0	\$0	\$0	0	\$0.00	\$0.00	
A Zones	9	\$12,698	\$674,200	3	\$42,073.00	\$2,175.00	
AO Zones	0	\$0	\$0	0	\$0.00	\$0.00	
AH Zones	0	\$0	\$0	0	\$0.00	\$0.00	
AR Zones	0	\$0	\$0	0	\$0.00	\$0.00	
A99 Zones	0	\$0	\$0	0	\$0.00	\$0.00	
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00	\$0.00	
V Zones	0	\$0	\$0	0	\$0.00	\$0.00	
D Zones	0	\$0	\$0	0	\$0.00	\$0.00	
B, C & X Zone							
Standard	2	\$2,193	\$491,000	0	\$0.00	\$0.00	
Preferred	16	\$6,605	\$5,390,000	3	\$4,541.92	\$1,425.00	
Total	27	\$21,496	\$6,555,200	6	\$46,614.92	\$3,600.00	

<https://isource.fema.gov/cis/insurance.action?method=getZone>

1/1

Town of Becket Hazard Mitigation Plan Update

3/31/2020



Home
Search
Previous Search
Community
CRS
CAC/CAV
Maps
SOS
Insurance
CAP-SSSE
CAV Selection

CIS Reports
Links
Request/Feedback
FAMS
Log Out

CIS: Insurance Overview

Community Information System

Release 5.02.00.02, 01/28/2020 -- Build 009, [Skip Navigation](#) Logged in as: joyduperault [Session expires in 20 mins]

Insurance Overview

As of 03/02/2020

Community:	BECKET ,TOWN OF	State:	MASSACHUSETTS
County:	BERKSHIRE COUNTY	CID:	250018

Overview	Occupancy	Zone	Pre/Post FIRM
Total by Community		Group Flood Insurance	
Total Number of Policies:	27	Total Number of Policies:	0
Total Premiums:	\$21,496	Total Premiums:	\$0
Insurance in Force:	\$6,555,200	Insurance in Force:	\$0
Total Number of Closed Paid Losses:	7	Total Number of Closed Paid Losses:	0
\$ of Closed Paid Losses:	\$46,615	\$ of Closed Paid Losses:	\$0
Post Firm Minus Rated Policies		Manufactured Homes	
Total Number of Minus Rated Policies:	0	Total Number of Policies:	0
A Zone Minus Rated Policies:	0	Total Number of Closed Paid Losses:	0
V Zone Minus Rated Policies:	0	\$ of Closed Paid Losses:	\$0
ICC		1316	
Total Number of ICC Closed Paid Losses:	0	Number of Properties by Community:	0
\$ of ICC Closed Paid Losses:	\$0		
Substantial Damage Losses			
Number of Substantial Damage Closed Paid Losses:		2	

<https://source.fema.gov/cis/insurance.action?method=getOverview>

1/1

Town of Becket Hazard Mitigation Plan Update

3/31/2020



Home
Search
Previous Search
Community
CRS
CAC/CAV
Maps
SOS
Insurance
CAP-SSSE
CAV Selection

CIS Reports
Links
Request/Feedback
FAMS
Log Out

CIS: Insurance Occupancy

Community Information System

Release 5.02.00.02, 01/28/2020 -- Build 009, [Skip Navigation](#) Logged in as: joyduperrault [Session expires in 20 mins]

Insurance Occupancy

As of 03/02/2020

Community:	BECKET ,TOWN OF	State:	MASSACHUSETTS
County:	BERKSHIRE COUNTY	CID:	250018

Overview	Occupancy	Zone	Pre/Post FIRM				
	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense	
Single Family	25	\$20,534	\$6,519,700	5	\$41,114.92	\$2,745.00	
2-4 Family	0	\$0	\$0	0	\$0.00	\$0.00	
All Other Residential	0	\$0	\$0	0	\$0.00	\$0.00	
Non Residential	2	\$962	\$35,500	2	\$5,500.00	\$925.00	
Total	27	\$21,496	\$6,555,200	7	\$46,614.92	\$3,670.00	

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense	
Condo	0	\$0	\$0	0	\$0.00	\$0.00	
Non Condo	27	\$21,496	\$6,555,200	7	\$46,614.92	\$3,670.00	
Total	27	\$21,496	\$6,555,200	7	\$46,614.92	\$3,670.00	

<https://source.fema.gov/cis/insurance.action?method=getOccupancy>

1/1

Town of Becket Hazard Mitigation Plan Update

3/31/2020



[Home](#)
[Switch](#)
[Printable Report](#)
[Community](#)
[GIS](#)
[CAC/CAV](#)
[Maps](#)
[SOS](#)
[Insurance](#)
[CAP-SOSIC](#)
[CAV Selection](#)
[CIS Reports](#)
[Links](#)
[Request/Feedback](#)
[FAMS](#)
[Log Out](#)

CIS: Community Overview

Community Information System

Release 5.02.00.02, 01/28/2020 -- Build 009, [Skip Navigation](#) Logged in as: joyduperault [Session expires in 19 mins]

Community Overview

Community:	BECKET ,TOWN OF	State:	MASSACHUSETTS
County:	BERKSHIRE COUNTY	CID:	250018

Program:	Regular	Emergency Entry:	03/08/1977	Regular Entry:	08/05/1991
Status:	PARTICIPATING			Status Effective:	08/05/1991
Current Map:	08/05/1991	Study Underway:	YES	Level of Regs:	
FIRM Status:	ORIGINAL			Initial FIRM:	08/05/1991
FHBM Status:	RESCINDED			Initial FHBM:	12/31/1976

Probation Status:

Probation Effective:

Suspension Effective:

Withdrawal Effective:

Probation Ended:

Reinstated Effective:

Reinstated Effective:

CRS Class / Discount:	Policies in Force:	27
Effective Date:	Insurance in Force:	\$6,555,200.00
CAV Date: 09/01/2000	No. of Paid Losses:	7
CAC Date: 04/25/1996	Total Losses Paid:	\$46,614.92
Workshop Date: 04/11/2019	Sub. Damage Claims Since 1978:	2
GTA Date: 01/07/2020		

Tribal Community

Community Website:

Upton Jones Claims

HMGP Projects

ICC Claims

FMA Projects

<https://source.fema.gov/cis/commForward.action?method=getCommunity&cid=250018&county=BERKSHIRE+COUNTY>

1/1

Town of Becket Hazard Mitigation Plan Update

Safe Growth Survey

Town of Becket SAFE GROWTH SURVEY

This survey instrument is designed to capture some general information for purposes of developing the *Becket Hazard Mitigation Plan Update*. It has been adapted from a technique recommended by the American Planning Association (APA) and FEMA to help evaluate the extent to which the Town of Becket is positioned to grow safely relative to its natural hazards. These hazards include but are not limited to hurricanes, floods, fires, winter storms and other severe weather systems.

Please indicate how strongly you agree or disagree with the following statements as they relate to the Town's current plans, policies, and programs for guiding future community growth and development.

1 = Strongly Disagree 2 = Somewhat Disagree 3 = Neutral 4 = Somewhat Agree 5 = Strongly Agree

GENERAL PLAN	
Land Use	
1. The general plan includes a future land use map that clearly identifies natural hazard areas.	1 2 3 4 5
2. Current land use policies discourage development and/or redevelopment within natural hazard areas.	1 2 3 4 5
3. The general plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	1 2 3 4 5
Transportation	
4. The transportation element limits access to natural hazard areas.	1 2 3 4 5
5. Transportation policy is used to guide future growth and development to safe locations.	1 2 3 4 5
6. Transportation systems are designed to function under disaster conditions (e.g., evacuation, mobility for fire/rescue apparatus, etc.).	1 2 3 4 5
Environmental Management	
7. Environmental features that serve to protect development from hazards (e.g., wetlands, riparian buffers, etc.) are identified and mapped.	1 2 3 4 5
8. Environmental policies encourage the preservation and restoration of protective ecosystems.	1 2 3 4 5

Town of Becket Hazard Mitigation Plan Update

Safe Growth Survey
Page 2

9. Environmental policies provide incentives to development that is located outside of protective ecosystems.	1	2	3	4	5
Public Safety					
10. The goals and policies of the general plan are related to and consistent with those in the Hazard Mitigation Plan.	1	2	3	4	5
11. Public safety is explicitly included in the plan's growth and development policies.	1	2	3	4	5
12. The monitoring and implementation section of the plan covers safe growth objectives.	1	2	3	4	5
ZONING ORDINANCE					
13. The zoning ordinance conforms to the general plan in terms of discouraging development and/or redevelopment within natural hazard areas.	1	2	3	4	5
14. The ordinance contains natural hazard overlay zones that set conditions for land use within such zones.	1	2	3	4	5
15. Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	1	2	3	4	5
16. The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	1	2	3	4	5
SUBDIVISION REGULATIONS					
17. The subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas.	1	2	3	4	5
18. The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.	1	2	3	4	5
19. The regulations allow density transfers where hazard areas exist.	1	2	3	4	5
CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES					
20. The capital improvement program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	1	2	3	4	5

Town of Becket Hazard Mitigation Plan Update

Safe Growth Survey
Page 3

21. Infrastructure policies limit the extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	1	2	3	4	5
22. The capital improvements program provides funding for hazard mitigation projects identified in the Hazard Mitigation Plan.	1	2	3	4	5
OTHER					
23. Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	1	2	3	4	5
24. The building code contains provisions to strengthen or elevate new or substantially improved construction to withstand hazard forces.	1	2	3	4	5
25. Economic development and/or redevelopment strategies include provisions for mitigating natural hazards or otherwise enhancing social and economic resiliency to hazards.	1	2	3	4	5

Thank you for your assistance in completing this survey.

Town of Becket Hazard Mitigation Plan Update

Appendix C: Mitigation Strategy Supporting Materials

Hazard Mitigation Actions in Priority Order

Priority Order	Mitigation Action	Responsible Party	Potential Funding Source	Cost Estimate	Timeline	Priority
1	Culvert Assessment	Highway Department	Complete Streets Grant	Low	August 2020 - July 2022	Top Priority
2	Outreach Plan	Emergency Management Department	Town	Very Low	March 2021-August 2024	Top Priority
3	Shelter Management Plan	Emergency Management Department	Town	Medium	March 2021-August 2024	Top Priority
4	Town Master Plan	Planning Board	Grant/Town Funds	Low	September 2020 - August 2023	Top Priority
5	Forest Study	Conservation Commission	Grant/Town Funds	Low	September 2020 - August 2023	Top Priority
6	Wetland/Floodplain Protection	Conservation Commission	Town	Medium	September 2020 - August 2024	Top Priority
7	Culvert Replacement	Highway Department	Grant/Town Funds	High	August 2020 - July 2025	High
8	Highway Garage	Town Administrator	Town	High	August 2020 - July 2025	High
9	Radio Tower	Town Administrator	Town	High	September 2020 - October 2023	High
10	Zoning Regulations	Planning Board	Grant/Town Funds	Very Low	September 2020 - October 2024	High
11	Public Education Program	Community Preservation Committee	Town	Very Low	March 2021-August 2024	High
12	Open Space and Recreation Plan	Town Administrator	Grant/Town Funds	Low	September 2020 - August 2023	High
13	Water Resource Plans	Conservation Commission	Grant/Town Funds	Low	September 2020 - August 2024	High
14	Palmer Brook Reservoir	Town Administrator	Town	High	August 2020 - July 2025	High
15	Flooding/Erosion Control	Conservation Commission	Town	Medium	August 2020 - July 2025	High

Town of Becket Hazard Mitigation Plan Update

Priority Order	Mitigation Action	Responsible Party	Potential Funding Source	Cost Estimate	Timeline	Priority
16	Wetlands Bylaw	Planning Board	Town	Very Low	September 2020 - August 2023	High
17	Invasive Species	Conservation Commission	Town	Medium	October 2020 - November 2023	High
18	Disease Vector Control	Board of Health	Town	Very Low	August 2020 - September 2025	High
19	Biodiversity	Planning Board	Town	Very Low	August 2020 - September 2025	High
20	Evacuation Plans	EMD	Town	Very Low	September 2020 - August 2023	High
21	Amend Local Bylaws	Bylaw Review Committee	Grant Funds?	Low	September 2020 - August 2024	Medium
22	Land Use Study	Town Administrator	Grant/Town Funds	Low	March 2021 - April 2024	Medium
23	Town Road Sedimentation	Highway Department	Town	Low	September 2020 - August 2024	Medium
24	Dam Outreach Program	Conservation Commission	Town	Very Low	August 2020 - July 2022	Medium
25	Expansion of Green Community Program	Community Preservation Committee	Green Communities/Town?	Low	August 2020 - July 2025	Medium
26	Camp Partnerships	Community Preservation Committee	Town	Very Low	March 2021- August 2024	Medium
27	Senior Outreach	Council on Aging	Town	Very Low	March 2021- August 2024	Medium
28	Incorporate Education	Town Administrator	Town	Very Low	March 2021- August 2025	Medium
29	Stormwater Management Bylaw	Planning Board	Town	Very Low	September 2020 - August 2024	Medium
30	Erosion Control Bylaw	Planning Board	Town	Very Low	September 2020 - August 2024	Medium
31	Ecological Landscaping	Conservation Commission	Town	Very Low	August 2020 - September 2025	Medium

Town of Becket Hazard Mitigation Plan Update

Priority Order	Mitigation Action	Responsible Party	Potential Funding Source	Cost Estimate	Timeline	Priority
32	Youth Volunteers	Conservation Commission	Town	Very Low	September 2020 - August 2023	Medium
33	Green Infrastructure	Highway Department	N/A	Very Low	October 2020 - September 2021	Low
34	Council on Aging	Council on Aging	Town	Very Low	August 2020 - July 2022	Low
35	Road Maintenance	Highway Department	Town	Low	September 2020 - August 2023	Low
36	Beaver Deceivers	Highway Department	Town	Very Low	August 2020 - July 2025	Low
37	Fire Safety	Fire Department	Grant/Town Funds	Very Low	September 2020 - August 2023	Low

Town of Becket Hazard Mitigation Plan Update

Appendix D: Plan Implementation Supporting Materials

Mitigation Plan Evaluation Worksheet

Note: This worksheet also exists as an Excel worksheet and was delivered to the Town upon plan completion.

Plan Section	Considerations	Explanation
Planning Process	Should the town invite any additional stakeholders to participate in the planning process? What public outreach activities have occurred? How can public involvement be improved?	
Risk Assessment	What disasters has the town, or the region experienced? Should the list of hazards be modified? Are new data sources, maps or studies available? If so, what have they revealed, and should the information be incorporated into the plan update? Has development in the region occurred and could it create or reduce risk?	
Capability Assessment	Has the town adopted new policies, plans, regulations, or reports that could be incorporated into this plan? Are there different or additional administrative, human, technical, and financial resources available for mitigation planning? Are there different or new education and outreach programs and resources available for mitigation activities?	
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimate accurate? Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or removed from the plan? Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update? Are there new funding sources to consider? Have elements of the plan been incorporated into other planning mechanisms?	

Town of Becket Hazard Mitigation Plan Update

Plan Section	Considerations	Explanation
Implementation Plan	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the plan implementation procedures?	

Town of Becket Hazard Mitigation Plan Update

Mitigation Action Progress Worksheet

Mitigation Action Progress Worksheet				
Progress Report Period	From Date		To Date	
Action/Project Title				
Responsible Department				
Contact Name				
Contact Phone/Email				
Project Description				
Project Goal				
Project Objective				
Project Cost				
Project Status				
Date of Project Approval	Date of Project Start	Anticipated Date of Completion	Project Canceled	Project Delayed
Explanation of Delay or Cost Overruns				
Project Report Summary				
What was accomplished for this project during this reporting period?				
What obstacles, problems, or delays did the project encounter?				
Plans for next reporting period.				