

Gardner Natural Hazard Risk Assessment

While this annex focus' pertains to critical facilities, flooding, risk assessment, existing protections and mitigation strategy in the community, more detailed descriptions of each natural hazard's impact on the region and its communities and summary of vulnerability can be located in the regional section entitled " 4. Identification of Natural Hazards, Identifying and Profiling Hazards".

Community Profile

The City of Gardner is located in North Central Massachusetts, bordered by Winchendon and Ashburnham on the North, Templeton on the west, Westminster on the east, and Hubbardston on the south. Gardner is 28 miles northwest of Worcester, 59 miles northwest of Boston, 61 miles northeast of Springfield, and 195 miles from New York City.

The City of Gardner covers an area of 23 square miles and has a resident population of 20,228, according to the 2010 US Census. The population density is 880 people per square mile. There are 9,126 housing units in the City, and the average household size is 2.30 people. The median age of Gardner's residents is 40.

Gardner has a proud history of furniture manufacturing. The City achieved international recognition as a major center for chair fabrication to the point that it became known as the "chair city of the world", a testament to this is a 20 foot tall chair sitting in front of the Helen Mae Sauter School. Gardner is home to numerous fine furniture outlets and is often called the "Furniture Capital of New England". Manufacturing is a significant part of its local economy, but now it is diversified rather than concentrated in chair and furniture manufacturing. Gardner is also home to Mount Wachusett Community College, Heywood Hospital, many unique shops and wide array of recreational opportunities including a municipal golf course and the southern terminus of the North Central Pathway. Henry Heywood Memorial Hospital is the largest employers in the City.

Critical Facilities

In general usage, the term "critical facilities" is used to describe all manmade structures or other improvements that, because of their function, size, service area, or uniqueness, have the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if they are destroyed, damaged, or if their functionality is impaired.

Critical facilities commonly include all public and private facilities that a community considers essential for the delivery of vital services and for the protection of the community. They usually include emergency response facilities (fire stations, police stations, rescue squads, and emergency operation centers [EOCs]), custodial facilities (jails and other detention centers, long-term care facilities, hospitals, and other health care facilities), schools, emergency shelters, utilities (water supply, wastewater treatment facilities, and power), communications facilities, and any other assets determined by the community to be of critical importance for the protection of the health and safety of the population. The adverse effects of damaged critical facilities can extend far beyond direct physical damage. Disruption of health care, fire, and police services can impair search and rescue, emergency medical care, and even access to damaged areas.

The number and nature of critical facilities in a community can differ greatly from one jurisdiction to another, and usually comprise both public and private facilities. In this sense, each community needs to determine the relative importance of the publicly and privately owned facilities that deliver vital services, provide important functions, and protect special populations. *Source: Federal Emergency Management Administration, Risk Management Series, Design Guide for Improving Critical Facility Safety from Flooding and High Winds, FEMA 543, January 2007.*

A list of the critical facilities within the community is shown in Table 41. This data was obtained from the community's Comprehensive Emergency Management Plan (CEMP). The data was then reviewed by the Emergency Management Director. These facilities were digitized into GIS and used for determining vulnerability to the various hazards. The map that follows entitled FEMA Q3 Flood Zones and Critical Infrastructure depicts Critical Facilities in the community.

Table 41: Gardner Critical Facilities

Feature Type	Name	Address
Animal Shelters	Gardner Animal Control Facility	899 West Broadway
City/Town Halls	Gardner City Hall	95 Pleasant Street
Clinics	North Central Human Services	31 Lake Street, Suites 181 & 9
	Community Health Link Lipton Couns	10 Parker St 3rd Floor
	Greater Gardner Community Health	175 Connors Street, 1st & 2nd
	You Inc. Family Center	205 School Street 1st Floor
College	Mount Wachusett Community College	444 Green Street
District Court	Gardner District Courthouse	108 Mathews Street
Public Water *Supply	Snake Pond Well	
	Cowee Pond	
	Perley Brook Reservoir	
	Crystal Lake	
	Camp Collier	
	Gardner Municipal Golf Course	
DPW Facilities	Gardner Highway Department	416 West Broadway
Early Education Childcare Facilities	MOC Child Care & Head Start Services/School Age	208 Coleman St. Ext.
	O'Leary, Nancy	22 A Street
	Meridian Gymnastics And Youth Fitness Preschool	871 W Broadway
	Dennis, Billie-Jo	90 Bear Hill Road
	Leger, Shauna	79 Ashley Drive
	Moschan, Heather	262 Temple Street
	Klever Kids Preschool & Extended Day Program	1055 West Street
	Bethany Christian Nursery	72 Ryan Street
	Dubey, Heidi	25 June Street
	King, Stephen	76 Grant Street
	Pellecchia, Laurie	66 Crestwood Drive

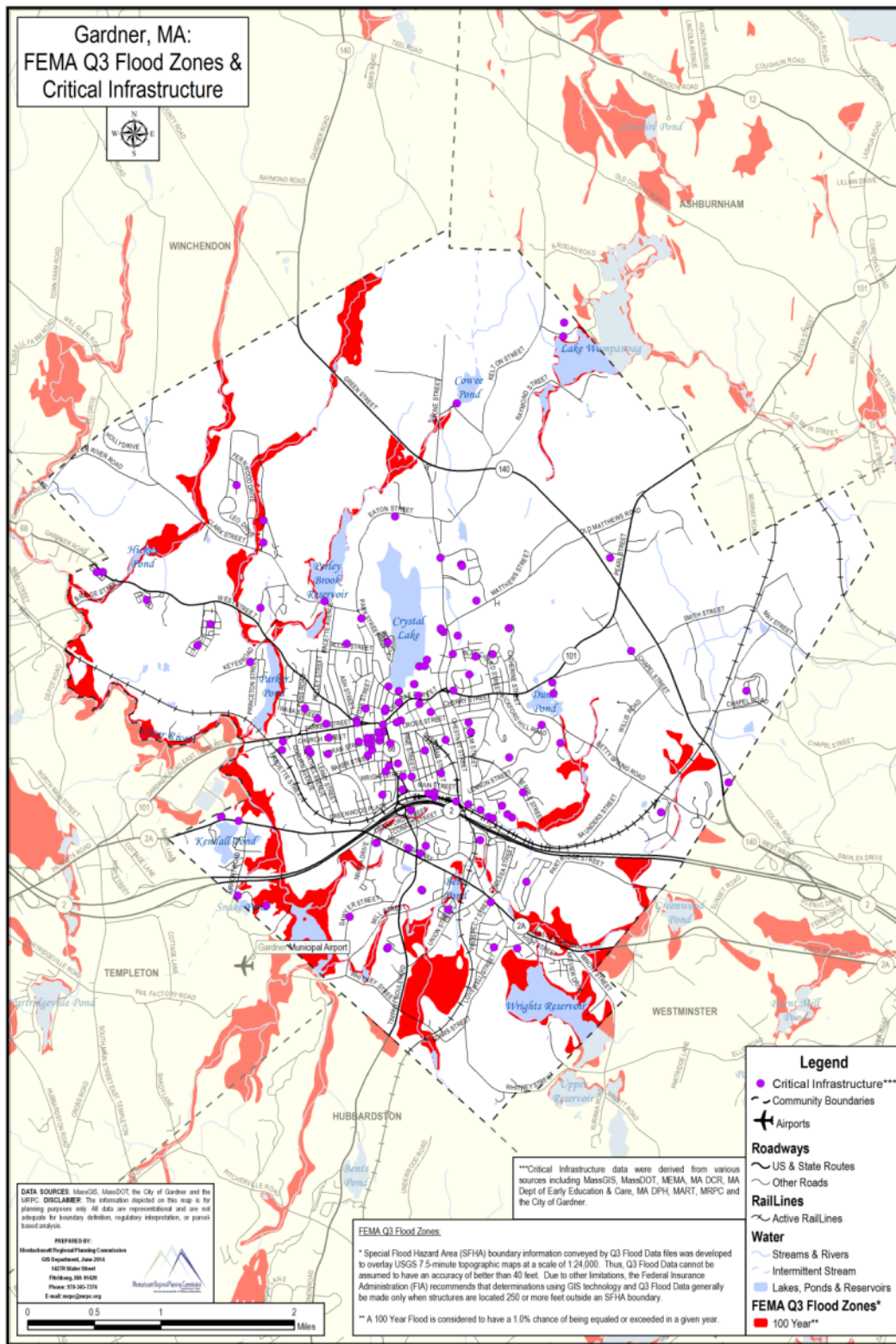
	Leblanc, Jane T.	66 Oak Street
	Leblanc, Roberta M.	62 Leamy Street
	L'etoile, Melanie N.	100 Chapel Street
	MOC Child Care & Head Start Services - Garrison	444 Green Street
	Goguen, Christine	306 Pine Street
	Guild Of St. Agnes - Gardner	155 Green Street
	Aukstikalnis, Deana M.	70 Sawyer Street
	Levasseur, Cynthia	52 Warwick Road
	Chaban, Paula	68 Norman Street
	Burgess, Doreen	79 Keyes Road
	Beauregard, Laura	24 Mayfield Road
	Coleman Child Care & Head Start Center	68 Coleman Street
	Saner, April L.	64 Snake Pond Road
	Maillet, Paula A.	29 Brookside Drive
	Mccaie, Georgette	196 Nichols Street
	Cormier, Suzanne	79 Robillard Street
	Mcgrath, Deborah Ann	63 Leamy Street
	Bradley, Becky	105 Brookside Drive
	Bushee, Janine	362 Park Street
Elderly Housing	Colonial Apartments	19 City Hall Avenue
	Heritage Village	55 Sunrise Lane
	Heywood Place Apartments	61 Lake Street
	Hillside Gardens	137 Blanchard Street
	The Binnall House	125 Connors Street
	Garwest	116 Church Street
Assisted Living	Heywood Commons	50 Pine Street
Electric Substations	National Grid Substation	53 Park Street
Emergency Dispensing Sites	Gardner High School	200 Catherine Street
	Gardner Middle School	297 Catherine Street
	Mount Wachusett Community College	444 Green Street
Emergency Shelters	Gardner High School	200 Catherine Street
	Elm Street School	160 Elm Street
	Mount Wachusett Community College	444 Green Street
	Gardner Middle School	297 Catherine Street
End of Life Facilities	Gardner Veterans Skating Rink	45 Veterans Dr.
	Boucher Funeral Home	110 Nichols St
	Smith Funeral Home Inc.	69 Vernon St
	Green Bower Cemetery	

	Crystal Lake Cemetery	
	Saint John's Cemetery	
	Notre Dame Cemetery	
	Wildwood Cemetery	
	Saint Joseph's Cemetery	
	Lamoureux Fletcher Community Funeral Home	105 Central Street
	John H Mack Funeral Home	91 Vernon Street
	Poliks Funeral Home	431 Pleasant Street
Emergency Operations Centers	Gardner Police Station	31 City Hall Avenue
	Gardner EOC	61 East Broadway
Fire	Gardner Fire Station	70 City Hall Avenue
	South Gardner Fire Station	61 East Broadway
Freight	Gardner Freight Rail Yard	
HazMat Sites	National Grid Substation	53 Park Street
	Verizon C.O.	43 West Street
	Pan Am	Union Square
	Data Guide Cable	232 Sherman Street
Hospice	Gardner VNA Inc. - Hospice	34 Pearly Lane
	Heywood Hospital	242 Green Street
	Heywood Rehabilitation Center	69 Pearson Boulevard
Long Term Care Facility	Gardner Center for Nursing and Rehabilitation	59 Eastwood Circle
	Wachusett Manor	32 Hospital Hill Road
	Swing Bed Coop with Athol Hospital	242 Green Street, Second Floor
Other Critical Facilities	Stop & Shop	384 Timpany Boulevard
	CVS	314 Main Street
	Price Chopper	560 Main Street
	Camp Collier	Camp Collier Road
	Lynde Hardware Store	483 Main Street
	Woods Ambulance	457 Main Street
	National Guard Unit	321 West Broadway
	Reservoir Hill	James Street
	Shell Oil	6 Pearson Boulevard
	Sunoco	17 Pearson Boulevard
	Hess	19 Pearson Boulevard
	Taylor Rental	22 Union Square
	Heritage State Park	Pearl/Smith Street
	Walmart	677 Timpany Boulevard
	Walmart (Pharmacy)	677 Timpany Boulevard

	Hannaford Supermarket	21 Timpany Boulevard
	Life Skills	95 Mechanic Street
	GAAMHA	208 Coleman Street
	Rite Aid	232 Main Street
	Rite Aid	52 Pearson Boulevard
	Heywood Hospital (family pharmacy)	242 Green Street
	Stop & Shop (pharmacy)	384 Timpany Boulevard
	Wheelen Supply	114 Main Street
	Aubuchon Hardware	34 Pearson Boulevard
	Maki Building Supply	35 Linus Allain Avenue
	Shell Station	4 Oak Street
	BP Station	221 Main Street
	Gulf Station	76 City Hall Avenue
	Shell Station	264 Timpany Boulevard
	Medstar	
Other Government Buildings	Gardner Highway Department	416 West Broadway
	Levi Heywood Memorial Library	55 West Lynde Street
	Gardner Post Office	
	Gardner Animal Control Facility	899 West Broadway
	Gardner Senior Center	294 Pleasant Street
Police	Gardner Police Station	31 City Hall Avenue
Prisons	North Central Corr. Institute (Gardner - Medium)	500 Colony Road
Pumping Stations	Crystal Lake Pumping Station	99 Heywood Street
School	Gardner High School	200 Catherine Street
	Helen Mae Sauter Elementary School	130 Elm Street
	Elm Street School	160 Elm Street
	Waterford Street School	62 Waterford Street
	Gardner Middle School	297 Catherine Street
	Our Lady of Holy Rosary	99 Nichols Street
	Sacred Heart of Jesus Elementary School	53 Lynde Street
	Wachusett Hills Christian School	100 Colony Road
	CAPS Educational Collaborative	53 School Street
Sports And Cultural Areas	Gardner Museum	28 Pearl Street
	Gardner Veterans Skating Rink	45 Veterans Dr.
	Greenwood Memorial Park & Pool	Park Street
	Dunn State Park Visitor Center	289 Pearl Street

Potable Water Treatment Plants	Crystal Lake Water Treatment Plant	99 Heywood Street
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As stated in 310 CMR 22.02, a Public Water System means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year” (Mass GIS, 2014).



Flood Prone Areas

Particular areas within the community where the risk of flood areas are or could occur were determined at the first meeting of the Gardner Local Hazard Mitigation Team held on May 30, 2012. This information can be found on Gardner's Local Hazard Map which is located under the section entitled Risk Assessment.

Flooding Vulnerability Assessment

An analysis of the FIRM flood hazard area maps indicates that there is a total of 1421.9 acres of 100-year floodplain within Gardner. This amounts to 9.65% of the total city. Based on additional analysis, 37.75 acres (2.66%) of the floodplain are developed. Currently there are 109 structures in the floodplain which is about 1.36% of the total structures in the community. The buildings are then multiplied by the building value, as determined by the MA Department of Revenue, to come up with a potential loss of \$75,140,300.

Excluding dams and bridges the table below lists critical facilities within the 100 year flood zone.

Table 42: Gardner Critical Facilities in the 100 year flood zone

<i>Feature Type</i>	<i>Name</i>	<i>Address</i>
Early Education Childcare Facilities	Bradley, Becky	105 Brookside Dr

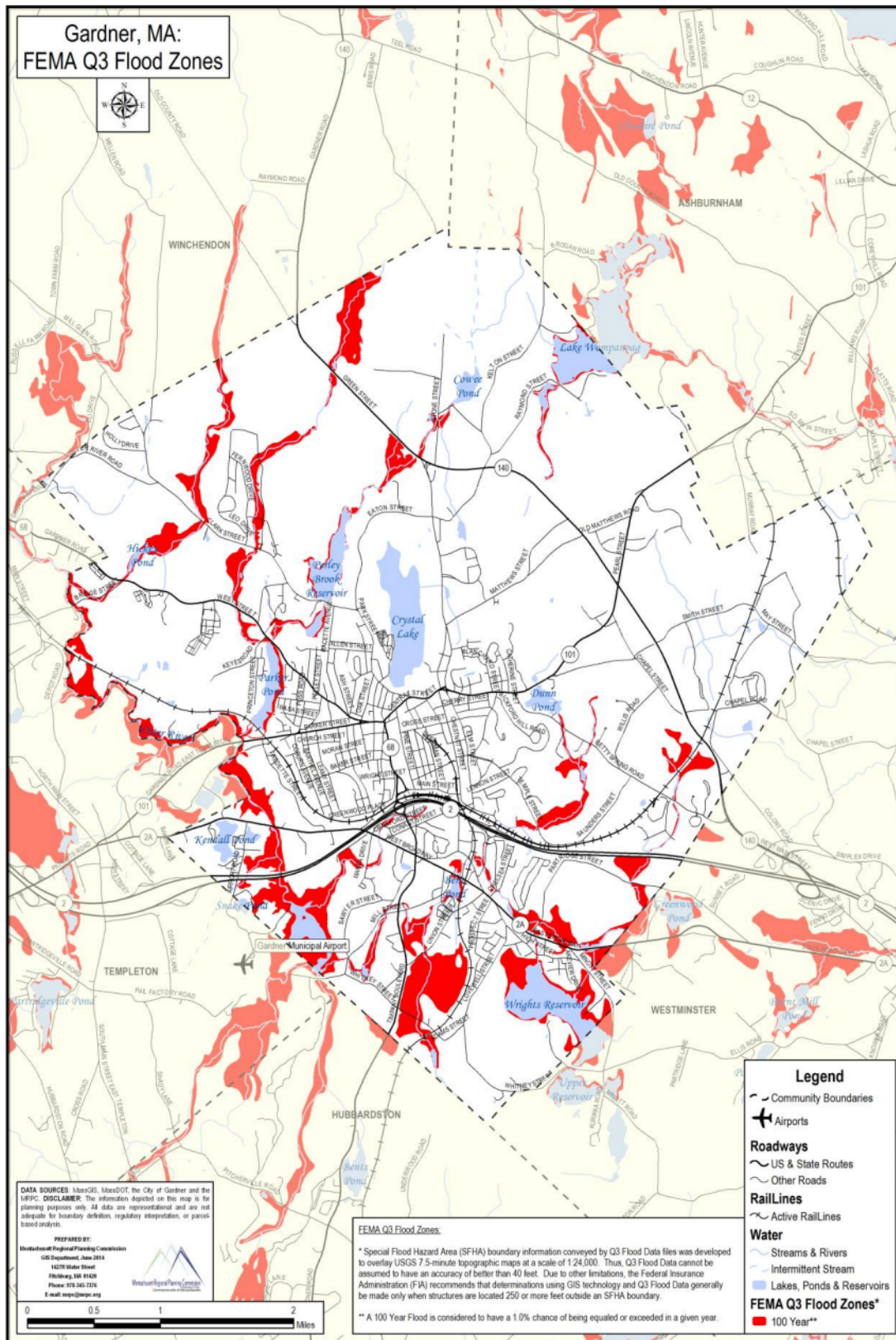
Since the initiation of the National Flood Insurance Program (NFIP), there have been no flood insurance claims in the City of Gardner. There are no repetitive loss properties in Gardner. Statistics from the NFIP BureauNet indicate in the City of Gardner there are nine flood insurance policies in force.

Floodplain Management and Compliance with NFIP

The City supports floodplain management activities in an effort to meet compliance of the National Floodplain Insurance Program. These efforts include:

- Implementing the MA Wetlands Protection Act and the City's Wetland's Protection Bylaw regulating development and activity within the wetlands buffer zone and regulating stormwater and other point source discharge.
- Implementing the City Flood Plain District Bylaw regulating development in the floodplain district.
- Continued maintenance of municipal stormwater drainage system which includes regular cleaning of catch basins, storm drains and culverts.
- Continued maintenance of public water bodies to reduce flooding caused by erosion and water displacement.
- Enforcement of the Open Space Residential Bylaw which mitigates possible flooding events by designating protected open space within a development which in turn treats stormwater runoff through the means of natural infiltration.

The map entitled FEMA Q3 Flood Zones which follows depicts the 100 year flood zones in the community.



Structurally Deficient Bridges Over Waterways

Gardner has one bridge over water that is classified by MassDOT as “structurally deficient”. The bridge is located on West Broadway over Bent Travers Pond.

Hazard Potential of Dams

The DCR Office of Dams Safety lists 21 dams in the City of Gardner as shown in Table 43. Wrights Reservoir Dam, Cowee Pond Dam and Perley Brook Reservoir Dam are classified as high hazard. Classifications for potential hazards are in accordance with the chart below.

Hazard Potential Classification

High Hazard	Refers to dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).
Significant Hazard	Refers to dams located where failure may cause loss of life and damage home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities
Low Hazard	Refers to dams located where failure may cause minimal property damage to others. Loss of life is not expected.

Source: MA Department of Conservation and Recreation Office of Dam Safety

High hazard dams must be inspected every two year, significant hazard every five years, and low Hazards dams every 10 years. Owners of dams are responsible for having their dam inspected. MGL Chapter 253 and 302 CMR 10.00 requires that dam owners prepare, maintain and update Emergency Action Plans for all High Hazard Potential dams and certain Significant Hazard Potential dams.

Non-jurisdictional dams are not regulated by the Office of Dam Safety or under their jurisdiction. Typically these dams are under 6 feet in height and/or under 15 acre-feet in storage and do not have an assigned 'Hazard Code'. Dams owned and regulated by the Federal Government are also typically non-jurisdictional but DO have an assigned Hazard Code.

Table 43: Dams – Gardner

City	Dam	Hazard Code	Owner
Gardner	Wright's Reservoir Dam	High Hazard	Public
Gardner	Cowee Pond Dam	High Hazard	Public
Gardner	Perley Brook Reservoir Dam	High Hazard	Public
Gardner	Bents Pond Dam	Low Hazard	Public
Gardner	Farm Pond Dam	Low Hazard	Public

Gardner	Old Duck Pond Dam	Low Hazard	Public
Gardner	Crystal Lake Dike	N/A	Public
Gardner	Old Mill Storage Pond Dam	N/A	Private
Gardner	Farm Pond Dam	N/A	Private
Gardner	Stump Pond Dam	N/A	Public
Gardner	Distribution Reservoir Dam	N/A	Public
Gardner	Old Poor Farm Pond Dam	N/A	Public
Gardner	Murdock Pond Dam	N/A	Private
Gardner	Beagle Pond Dam	Significant Hazard	Private
Gardner	Parker Pond Dam	Significant Hazard	Public
Gardner	Dunn Pond Dam	Significant Hazard	Public
Gardner	Ramsdall Pond Dam	Significant Hazard	Private
Gardner	Hobbys Pond Dam	Significant Hazard	Private
Gardner	Hilchey Pond Dam	Significant Hazard	Private
Gardner	Wayside Pond Dam	Significant Hazard	Public
Gardner	Mahoney Pond Dam	Significant Hazard	Public

*N/A – Information not available as the dam is non-jurisdictional.

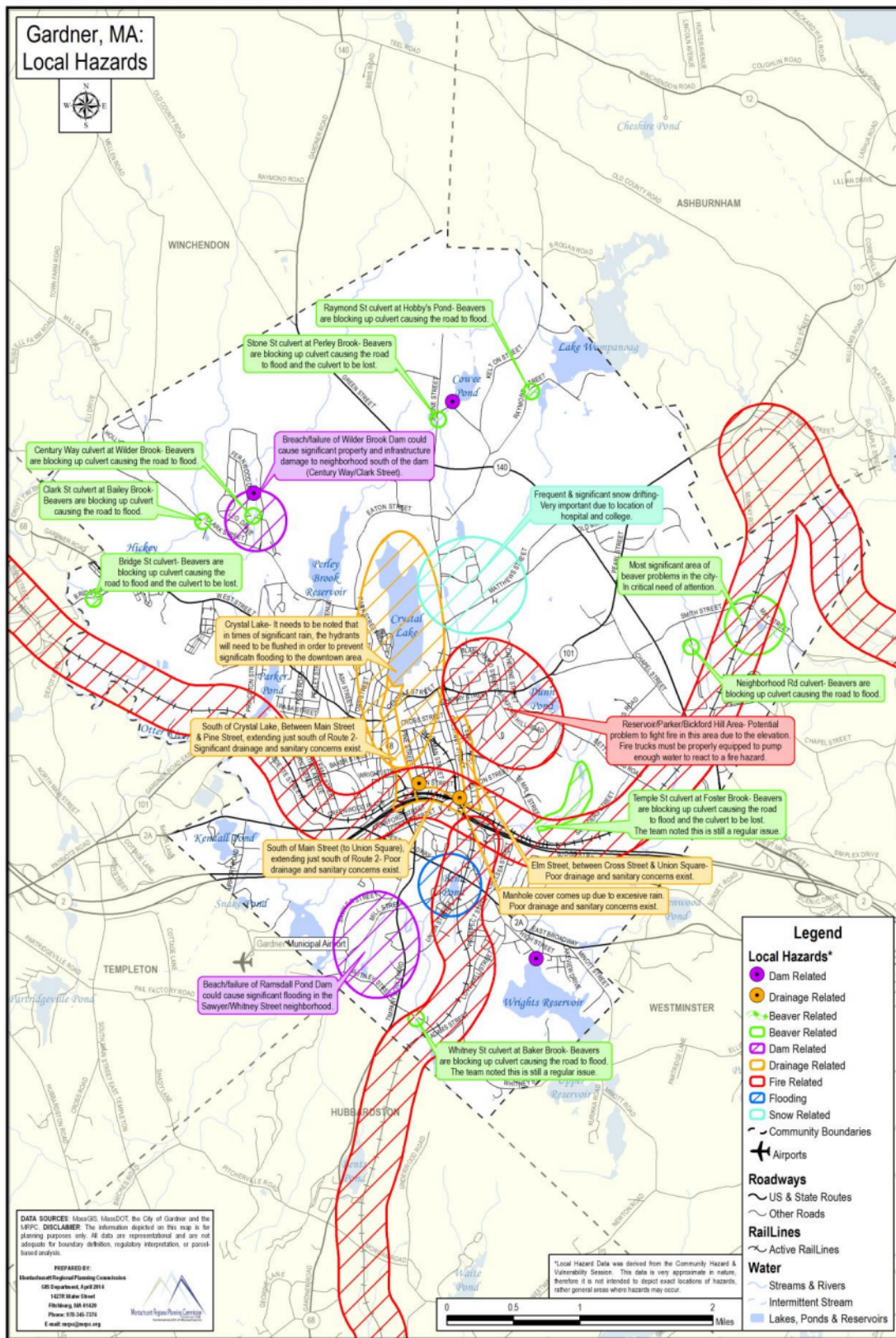
Risk Assessment

As previously stated, located in Section 4. Identification of Natural Hazards, Identifying and Profiling Hazards”, there is a description of each identified hazards’ impact on the region and its communities as well as an overall summary of vulnerability. Based on the hazards identified in this plan and the assessment of risks by the City of Gardner, the City considers itself to be at a high risk for Heavy Rain, Ice Jams, Beavers, Nor’easters, Severe Thunderstorms, Heavy Snow, Ice Storms, Blizzard, and Major Urban Fires; moderate risk for Snow Melt, Dam Failure, High Winds, Hurricanes, Tornados, Drought and Extreme Temperatures; low risk for Wildland Fire, Earthquakes, and Landslides; and tsunamis as not applicable.

This information is documented in Gardner’s’ Natural Hazard Matrix below which was obtained from participants at Gardner’s Local Hazard Mitigation Team Meeting held on May 30, 3012.

Gardner Natural Hazard Matrix				
Natural Hazard	Likelihood of Occurrence	Location	Impacts	Hazard Index
Natural Hazard Separated by Flood, Atmospheric Related and Winter Related, Other Natural Hazards, and Geologic Hazards	3 = Highly Likely 2 = Possible 1 = Unlikely	3 = Regional/State 2 = Multi Community/Regional 1 = Local/Town	4 = Catastrophic 3 = Critical 2 = Limited 1 = Negligible	Ranking Determined by Combining the Likelihood, Location and Impacts of a Natural Hazard
Flood-Related Hazards				
• Heavy Rain	3	2	3	7
• Snow Melt	2	2	2	6
• Dam Failure	2	2	4	8
• Ice Jams	3	1	2	6
• Beavers	3	1	2	6
Atmospheric Related and Winter Related Hazards				
• High Winds	2	2	3	7
• Hurricanes	2	3	3	8
• Tornadoes	2	2	4	8
• Nor'easters	3	3	3	9
• Severe Thunderstorms	3	2	2	7
• Heavy Snow	3	3	3	9
• Ice Storms	3	2	4	9
• Blizzard	3	3	3	9
Other Natural Hazards				
• Major Urban Fires	3	1	2	6
• Wildland Fire	1	2	2	5
• Drought	2	3	2	7
• Extreme Temperatures	2	3	2	7
Geologic Hazards				
• Earthquakes	1	2	4	7
• Landslides	1	1	1	3
• Tsunami	NA	NA	NA	NA
Key Highly likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year. Possible: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years. Unlikely: Less than 10 percent probability of occurrence in the next year or a recurrence interval of greater than 11 years. Catastrophic: Immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions. Critical: Fast speed of onset or long duration of event resulting in devastating damage and loss of services for weeks or months. Limited: Moderate speed of onset or moderate duration of event, resulting in some damage. Negligible: Slow speed of onset or short duration of event resulting in little to no damage.				

Also discussed at this meeting were the hazards that affect each community and the identification of specific problem areas in the community that need to be addressed. This included the identification of new hazards that were determined to pose a threat or community vulnerability which are detailed in Gardner's Local Hazards Map on the following page. The entire community is equally at risk to the following hazards: heavy rain, snow melt, ice jams, high winds, hurricanes, tornados, nor'easters, severe thunderstorms, ice storms, blizzards, drought, extreme temperatures, earthquakes and landslides.



Existing Protections

The original inventory of hazard mitigation actions which the Montachusett communities undertook for the 2008 Montachusett Region Hazard Mitigation Plan was reviewed and updated by each community at a meeting held in each community with the MRPC and the community's Local Hazard Mitigation Planning Team and, in some communities, the Emergency Management Committee. The attendees of the meetings can be found in Appendix A. The following matrices depict the updated inventory of what is currently being done to mitigate hazards by listing the programs and activities already in place. It includes a description of the protection measure, who is responsible, and improvements and changes that may be needed. This inventory was used by the Planning Team/Emergency Management Committee to identify gaps in existing protections that were then addressed through the development of this plan update.

Gardner

Type of Existing Protection	Description	Area Covered	Implementation Resources and Funding*	Improvements or Changes Needed
Flood Related Hazards				
Storm water management standards	State Regulation under the Wetlands Protection Act to regulate storm water and other point source discharge	City-Wide	Enforced by the Gardner Conservation Comm. (Wetlands Protection Act) staffed by the municipal Conservation Agent and Gardner Planning Board (Subdivision Control Law and site plan review) staffed by the municipal Community Development and Planning Department.	Storm water management standards are and continue to be enforced. No improvements or changes needed.
Wetlands Protection Act (state)	State law regulating development and activity within wetland buffer zone	100-foot state buffer around wetland area; 200 foot buffer around river front areas	Enforced by the Conservation Commission staffed by the municipal Conservation Agent.	No improvements or changes needed.
Wetlands Protection Bylaw (local)	Local bylaw supplementing the Wetlands Protection Act	100-foot state buffer around wetland area; 200 foot buffer around river front areas	Enforced by the Conservation Commission staffed by the municipal Conservation Agent.	No improvements or changes needed.
100 Year Flood Zone	Federal law requiring elevation above 100-year flood level of	100-year floodplain as shown on Flood	Enforced by the Building Inspector (municipal staff) and	Insurance Flood Rate Maps need to be updated.

	new and substantially improved residential structures in floodplain	Insurance Rate Map dated July 2, 1981	Gardner Conservation Commission staffed by the municipal Conservation Agent.	
City Bylaw Flood Plain Overlay District	Local bylaw enhancing federal/state laws and regulating any development in the flood plain district	100-year floodplain as shown on Flood Insurance Rate Map dated July 2, 1981	Enforced by the Building Inspector (municipal staff) and regulated by Board of Appeals.	Insurance Flood Rate Maps need to be updated.
Maintenance of municipal storm water drainage system	Regular cleaning of catch basins, storm drains, and culverts	City-Wide	Undertaken by the Department of Public Works municipal staff.	Maintenance continues, but Additional Personnel and Equipment Needed to undertake this task.
Maintenance of public water bodies (ponds, streams, brooks, wetlands)	Periodic cleaning of waterways is undertaken, i.e., remove trash, debris	City Wide	Undertaken by the Department of Public Works municipal staff with guidance from Conservation Commission staffed by the municipal Conservation Agent.	Maintenance continues. No improvements or changes needed.
Inspection of major dams	Periodic inspections of the structural integrity of the dam	Major Dams	Undertaken by the Massachusetts Department of Conservation and Recreation, Office of Dam Safety	Update Dam failure studies for the dams rated as high hazard
<u>Wind Related Hazards</u>				
State Building Code	State Law related to design loads to include wind effects	City-Wide	Enforced by Building Department (municipal staff).	Continued enforcement remains in place. No improvements or changes needed.
Tree Maintenance	Regular inspection and tree maintenance to cut branches threatening power lines and overhead utilities	City-Wide	National Grid staff (Electric Company) and Gardner Department of Public Works municipal staff.	Additional Staff needed by the city to undertake this task.
<u>Fire Related Hazards</u>				
Limited Brush Clearing	Brush clearing to provide access to Emergency Service vehicles.	City-Wide	Undertaken by the Department of Public Works municipal staff.	Continue to Identify additional Areas with Potential for Brushfires.

Winter Storms Related				
Parking Bans	Parking Bans to Enable Snow Removal Effectively from Residential Streets	City-wide	Department of Public Works municipal staff.	Additional personnel and equipment needed to enforce parking bans.
Clearing Snow from Major Arterial Routes	Clear snow to Ensure Access to Emergency Service vehicles.	City-wide	Department of Public Works municipal staff.	Snow clearing continues but Additional personnel and equipment needed.

*Gardner's enforcement/implementation is generally carried out by elected/appointed boards and commissions and municipal staff whose positions are funded through local taxes.

Mitigation Goals, Objectives and Strategies

As discussed earlier in this Plan, MRPC previously prepared the 2008 Montachusett Region Hazard Mitigation Plan which consisted of individual annexes for each MRPC community. Similarly, as part of the multi-jurisdictional plan update, each community also developed their own individual goals, objectives and strategies which are listed in this section.

Gardner Overall Goal Statement: To reduce the loss of life, property, infrastructure and cultural resources throughout the city of Gardner from natural disasters through a multiple hazard mitigation program that involves increased coordination, planning, education, and capital improvements.

1. **Objective:** To provide adequate shelter, water, food, and basic first aid to displaced residents in the event of a natural disaster, and to provide adequate notification and information regarding evacuation procedures, *etc.*, to residents in the event of a natural disaster.
2. **Objective:** to increase coordination between inter-departments in pre-disaster planning, post-disaster recovery and continuous hazard mitigation implementation.
3. **Objective:** Increase awareness of hazard mitigation among city officials, private organizations, businesses, and the general public.
4. **Objective:** To ensure that critical infrastructure sites are protected from natural hazards, and to maintain existing mitigation infrastructure in good condition.
5. **Objective:** To educate the public about the threat of natural hazards and the possible mitigation measures that can be taken to protect public health and safety, as well as infrastructure and property; and to educate the public as well about zoning and building regulations, particularly regulations that relate to new construction.
6. **Objective:** To encourage future development in areas that is not prone to natural disasters.
7. **Objective:** To identify existing shelters that is earthquake resistant as well as outside of floodplain and inundation areas. Disseminate this information to appropriate city departments.
8. **Objective:** To inventory supplies at existing shelters and develop a needs list and storage requirements; and to establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplies in the event of a natural disaster.
9. **Objective:** To maintain Code Red notification system.
10. **Objective:** To collect, periodically update, and disseminate information on which local radio and TV stations and cable TV provide emergency information, what to include in a 'home survival kit,' how to prepare homes and other structures to withstand flooding and high winds, and the proper evacuation procedures to follow during a natural disaster.

Specific Natural Hazard Goals for Gardner

Goal Statement for Flooding: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to flooding. And to pursue prevention activities which include planning, zoning, open space preservation, floodplain and wetland development regulations, storm water management, waterway dumping regulations, watershed protection measures, and best management practices, as well as, soil erosion, building ordinances, and subdivision regulations.

1. **Objective:** To implement standards in the Subdivision Rules and Regulations to require temporary and permanent erosion control measures for streams and surface water bodies.
2. **Objective:** To add more specific requirements to address flood related issues in the Special Permit and Site Plan Approval provisions in the Gardner Zoning Bylaw including topographic change, removal of cover vegetation, risk of erosion or siltation and increased storm water runoff.
3. **Objective:** To identify all structures throughout city that needs to be elevated above the base-flood elevation.
4. **Objective:** To Develop a priority list and seek funding through the Hazard Mitigation Grant Program (HMGP) for the replacement of undersized culverts throughout the city.

Goal Statement for Protection from Beavers: To minimize the threat to health, the damage to roads and property, and the disruption of governmental services and general business activities due to flooding caused by beavers.

1. **Objective:** Support local city departments to continue present method to prevent beaver caused flooding.
2. **Objective:** Seek assistance from beaver management professionals, including trappers.
3. **Objective:** Install beaver management devices

Goal Statement for Hurricanes and Tornadoes: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to high winds associated with hurricanes and tornadoes. (The objectives listed above, under flooding, address the flooding that can result from a hurricane.)

1. **Objective:** To educate residents and volunteers regarding the safe methods and actions necessary to deal with Hurricanes and Tornados.

Goal Statement for Winter Related Hazards: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to severe snow and ice storms.

1. **Objective:** To develop a plan for providing access to water, information, shelter, and food stores to people in remote locations in Gardner in the event of a severe winter storm.

Goal Statement for Dam Failure: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures.

1. **Objective:** To identify sources of funding for dam safety inspections.

Goal Statement for Earthquakes: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to earthquakes.

1. **Objective:** To evaluate all Shelters and Reception Centers to determine if they are earthquake resistant.

2. **Objective:** To insure that all identified shelters have sufficient back-up utility service in the event of primary power failure.

Goal Statement for Drought: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to drought.

1. **Objective:** Prepare a Water Conservation Plan for Gardner.

Goal Statement for Wildfires/Brushfires: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to wildfires/brushfires.

1. **Objective:** Develop and distribute an educational pamphlet on fire safety and prevention.

Goal Statement for Weather Extremes: To minimize the loss of life and the threats to public health and safety.

1. **Objective:** To develop and distribute educational information regarding the threats from extreme heat and cold.

2. **Objective:** To educate the residents as to the causes and effects of global warming; and how it affects the residents of Gardner, and what they could be doing to help improve the situation.

Mitigation Action Plans and Prioritization of Actions (STAPLEE)

Initial Mitigation Action Plans for the Montachusett Communities were presented in the communities Hazard Mitigation Plans that were approved by FEMA in 2009 and 2010. The original Mitigation Action Plans were developed through an inventory of potential hazards which could impact the community and an evaluation of a range of alternatives to address these hazards. As part of the plan update process, the original Mitigation Action Plan was reviewed by the community's Local Hazard Mitigation Planning Team/Emergency Management Committee to delete actions which have already been completed, add additional actions which are either underway or planned to be undertaken, and to update the current status of all actions. The goals were reviewed and updated at the second meeting with each community.

An additional step in this process was to conduct a "STAPLEE" analysis for each action to prioritize all actions within each community and a subjective evaluation of each action's perceived cost/benefit. In the 2008 plan, actions were not prioritized so there were no changes in priorities in this update. The revised Community Mitigation Action Plans matrices that follow identify each mitigation action, the responsible department or board responsible for implementation, potential funding sources, the timetable of the action, results of the prioritization of actions through the STAPLEE analysis, and the perceived cost/benefit for each mitigation action.

The goal of each identified strategy, or mitigation action, is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each action to establish priorities for implementation, using the "STAPLEE" method. The STAPLEE methodology was developed by the Federal Emergency Management Agency as a tool to help communities prioritize their hazard mitigation strategies and determine the most appropriate actions for implementation. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of an action and is designed to be used by public officials and planners for making planning decisions.

To conduct the STAPLEE exercise, the community's Hazard Mitigation Team was asked to rate each action in their Mitigation Action Plan on each of the following criteria, using a score of 1 to 3 (Good = 3, Average = 2, Poor = 1):

- Social: Is the proposed action socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Technical: Will the proposed strategy work? Will it create more problems than it solves?
- Administrative: Can the community implement the action? Is there someone to coordinate and lead the effort?
- Political: Is the action politically acceptable? Is there public support both to implement and to maintain the action?
- Legal: Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Economic: What are the costs of this action? Does the cost seem reasonable for the size of the problem and the likely benefits?
- Environmental: How will the action impact the environment? Will the action need environmental regulatory approvals?

These scores were then totaled, resulting in a final score of 7 (least priority) to 21 (highest priority) for each action. The higher the final score, the higher the relative priority of that action for implementation. This information can then be utilized in each community as they conduct and administer relevant municipal functions and activities. The final STAPLEE score for each action is shown in the following mitigation action plan.

The Hazard Mitigation team was also asked to do a relative cost/benefit of each action. This assessment was intended to informally indicate if an action will either have more benefits accrued to the Town than the Cost of implementing the action, or if the costs would exceed any benefits. Responses include: "Benefits Exceed Costs", "Benefits Equal Costs, or "Costs Exceed Benefits".

GARDNER IMPLEMENTATION STRATEGY FOR PRIORITY MITIGATION ACTIONS

Type of Natural Hazard	Description of Action	Implementation Responsibility	Resources/ Funding	Timetable	Priority (STAPLEE SCORE)	Cost/ Benefit Evaluation	Status Update from 2008 Plan**
Wildland Fire	Increase awareness by educating property owners regarding actions that they can take to reduce risk to property by hosting an Open House at the Fire Department, Develop and Distribute an Educational Pamphlet on Fire Safety and Prevention (SAFE PROGRAM) (SENIOR SAFE) and wildfire prevention.	Fire Department	Municipal Staff	2015 - 2020	19	Benefits exceeds costs	Completed but carried forward. Action undertaken annually.
All Natural Hazards	Increase hazard education and risk awareness to public by Collecting, Updating, and Disseminating Information on Local Radio/TV Stations to educate the public and alert them of emergency information including shelter locations and other instructions	Emergency Management Director	Municipal Staff	2015 - 2020	21	Benefits exceeds costs	Completed but carried forward. Ongoing. This action is undertaken periodically.

	related to all natural hazards						
All Natural Hazards	Inventory Supplies at Existing Shelters and Develop a Needs List and Storage Requirements to ensure the available of adequate supplies during a natural hazard. Supplies must be adequate to eliminate or reduce risk to human life.	Emergency Management Planning Committee, School Facilities Manager	Municipal Staff	2015 - 2020	21	Benefits exceeds costs	Completed but carried forward as this action is undertaken as necessary.
Other Natural Hazards – (Major Urban Fires and Wildland)	Maintain the Low Pressure Water Hydrants to ensure existing mitigation infrastructure is in good condition.	Fire Department, Department of Public Works	Grants if Available	2015 - 2020	19	Benefits exceeds costs	New action.
Flood Related Hazards.	Identify all structures throughout the town that need to be Elevated above the Base-Flood Elevation. Once identified educate those property owners about mitigation options.	Building Inspector, Fire Department	Municipal Staff. Also 75% FEMA FUNDING AVAILABLE. Remaining 25% (non-federal)	2015 - 2020	13	Benefits exceeds costs	Carried forward due to time constraints.

Flood Related Hazards	To Develop a priority list and possibly seek funding through the Hazard Mitigation Grant Program (HMGP) for the replacement of undersized culverts throughout Town to reduce or eliminate flooding risk.	City Council, Highway Department	Municipal Staff/ FEMA HMGP grant 75%	2015-2020	21	Benefits exceeds costs	Carried forward due to time constraints.
Flood Related Hazards	Educate property owners regarding options for mitigating their properties from flooding through outreach programs that address measures that residents can take (i.e installing backflow valves, securing debris, etc.)	Emergency Management Director, Fire Department	Property Owners	2015 - 2020	21	Benefits exceeds costs	New Action.
Flood Related Hazards	Continue participation in the National Flood Insurance Program to enable property owners to purchase insurance protection	City Council, Conservation Commission	FEMA/MEMA	2015 - 2020	21	Benefits exceeds costs	Completed but carried forward. The city continues its participation in this program.

	against flood losses.						
Flood Related Hazards	Evaluate and relocate furnaces, water heaters, and electrical equipment in municipal owned buildings that are located in areas prone to flooding to reduce flood damage.	Emergency Management Director, Fire Department	Municipal Staff and Property Owners	2015-2020	19	Benefits exceeds costs	Carried forward due to time constraints and lack of municipal funding.
All Natural Hazards	Utilize interactive mapping application prepared by MRPC/CMRPC to update critical infrastructure and simulate real time evacuation scenarios to mitigate hazards to the public.	Emergency Management Director	Emergency Management Director	2015-2020	21	Benefits exceeds costs	New action.
Flood Related Hazards	Install "beaver diverters" and water control devices to mitigate flooding caused by beaver dams.	Department of Public works	Municipal Staff	2015 – 2020	19	Benefits exceeds costs	Completed but carried forward. Action undertaken as needed.
Flood Related Hazards	Hire trapper for removal of beavers to mitigate flooding caused by beaver dams.	Department of Public works	Municipal Staff	2015 – 2020 as needed	19	Benefits exceeds costs	Completed but carried forward. Action undertaken as needed.

All Natural Hazards	Implement recommendations regarding natural hazard mitigation in existing planning documents including the five year action plan of the open space and recreation plan and the emergency evacuation plan.	Conservation Commission, City Council, Planning Board, Emergency Management Director	Conservation Commission, City Council, Planning Board, Emergency Management Director	2015 – 2020	21	Benefits exceeds costs	Completed but carried forward. This is an ongoing effort. For example, City recently applied for site assessment money to clean-up brownfield sites. Re-use of former brownfield sites could reduce stormwater runoff/flooding. This was a recommendation of the Urban Renewal Plan.
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*Unless otherwise noted, Gardner's Resources/Funding consists of elected/appointed boards and commissions and municipal staff whose positions are funded through local taxes.

**Actions identified as carried forward were not completed in the previous planning cycle unless otherwise stated.

Mitigation Actions from the 2008 Montachusett Region Hazard Mitigation Plan that are complete include:

- Identify Existing Shelters that are Earthquake Resistant as well as Outside of Floodplain (and Dam Inundation)
- Develop a plan for providing access to water, information, shelter, and food stores to people in remote locations of the city in the event of a severe winter storm.
- Identify shelters and publicize locations.
- Expand Residential parking bans to enable snow removal from all streets.
- Work with Neighboring Communities to Establish a Community Emergency Response Team (CERT).

Groton Natural Hazard Risk Assessment

While this annex focus' pertains to critical facilities, flooding, risk assessment, existing protections and mitigation strategy in the community, more detailed descriptions of each natural hazard's impact on the