

Town of Wales

Hazard Mitigation Plan



Adopted by the Wales Select Board on 8/11/2015

Prepared by:

Wales Hazard Mitigation Committee

and

The Pioneer Valley Planning Commission

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Bruce Cadieux, Road Commissioner
Jeffrey Hastings, Police Chief
Heather Ackerman, Senior Center Director

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1: PLANNING PROCESS

Introduction

The Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA) define Hazard Mitigation as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, hurricanes, wildfires, earthquakes, etc. Mitigation efforts undertaken by communities will help to minimize damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural and historic resources.

Planning efforts, like the one undertaken by the Town of Wales and the Pioneer Valley Planning Commission, make mitigation a proactive process. Pre-disaster planning emphasizes actions that can be taken before a natural disaster occurs. Future property damage and loss of life can be reduced or prevented by a mitigation program that addresses the unique geography, demography, economy, and land use of a community within the context of each of the specific potential natural hazards that may threaten a community.

Preparing a hazard mitigation plan before a disaster, can save the community money and facilitate post-disaster funding. Costly repairs or replacement of buildings and infrastructure, as well as the high cost of providing emergency services and rescue/recovery operations, can be avoided or significantly lessened if a community implements the mitigation measures detailed in the plan.

FEMA requires that a community adopt a pre-disaster mitigation plan as a condition for mitigation funding. For example, the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program are programs with this requirement.

This is Wales' first Hazard Mitigation Plan, and it will be updated moving forward every 5 years.

Hazard Mitigation Committee

The creation of Wales' first Hazard Mitigation Plan involved a 4-member committee:

- John Croke, EMD and Deputy Fire Chief
- Bruce Cadieux, Road Commissioner
- Jeffrey Hastings, Police Chief
- Heather Ackerman, Senior Center Director

The natural hazard mitigation planning process for the Town included the following tasks:

- Reviewing and incorporating existing plans and other information.
- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations the community is currently implementing to protect against future disaster damages.
- Identifying deficiencies in the current strategies and establishing goals for updating, revising or adopting new strategies.
- Adopting and implementing the final Hazard Mitigation Plan.

The key product of this process is the development of an Action Plan with a Prioritized Implementation Schedule. The final product of this process was completion of the Town's first edition of its Hazard Mitigation Plan.

Committee Meetings

Meetings of the Town's first Hazard Mitigation Committee, all of which took place at Wales Town Hall or the Wales Senior Center, were held on the dates listed below.

September 9th, 2014, 5:30 p.m.

Hazard mitigation planning overview, identification of the planning team, identifying critical facilities, review of hazards and discussion of history of natural hazard events.

October 6th, 2014, 9:30 a.m.

Revisiting of critical facilities, discussion of existing mitigation strategies undertaken, discussion of potential mitigation strategies to be implemented.

January 12th, 2015, 11:30 a.m.

Reviewing identified list of current mitigation strategies undertaken by the town and draft of prioritized list of mitigation strategies, based on conversation at previous meeting. Finalizing of list of implementation strategies, discussion of adoption process and procedures for regular maintenance of the plan.

Agendas and sign-in sheets for each meeting can be found in Appendix B. While not all members of the Hazard Mitigation Committee were able to attend each meeting, all members collaborated on the plan and were updated on progress by fellow Committee members after meetings occurred as necessary.

Participation by Stakeholders

A variety of stakeholders were provided with an opportunity to be involved in the development of the Wales Hazard Mitigation Plan. The different categories of stakeholders that were involved, and the engagement activities that occurred, are described below.

Local and regional agencies involved in hazard mitigation activities and surrounding community engagement and input

The Pioneer Valley Planning Commission is a regional planning agency for 43 towns and cities in Massachusetts' Hampden and Hampshire Counties. PVPC regularly engages with the Town of Wales part of its regional planning efforts, which include the following:

- Developing the Pioneer Valley Regional Land Use Plan, Valley Vision 2, which advocates for sustainable land use throughout the region and consideration for the impact of flooding and other natural hazards on development.
- Developing the Pioneer Valley Climate Action and Clean Energy Plan, which assesses the impact that climate change will have on the region and recommends strategies for mitigation that can be implemented by local municipalities and businesses.
- Collaborating with state agencies, such as the Department of Conservation and Recreation, to maintain inventories of critical infrastructure throughout the region.

All of these PVPC initiatives considered the impact of natural hazards on the region and strategies for reducing their impact to people and property through hazard mitigation activities. The facilitation of the Wales Hazard Mitigation Plan by PVPC ensured that the information from these plans was incorporated into the Hazard Mitigation Planning process.

In addition, the Pioneer Valley Planning Commission is actively involved in the Western Region Homeland Security Advisory Council (WRHSAC). WRHSAC, which includes representatives from Western Massachusetts municipalities, Fire Departments, Public Works Departments, Police Departments, area hospitals and regional transit from throughout the four counties of western Massachusetts, is responsible for allocating emergency preparedness funding from the US Department of Homeland

Security. The representatives of these disciplines who serve on the WRHSAC are charged with sharing the information discussed at meetings with their colleagues at their regular meetings. PVPC staff attend all WRHSAC meetings and all WRHSAC members are aware of the fact that Wales was updating its Hazard Mitigation plan. Meetings of WRHSAC regularly involve discussion about how to improve emergency preparedness in western Massachusetts, and hazard mitigation activities are included in this discussion.

For the update of this Hazard Mitigation Plan, PVPC provided feedback from WRHSAC on regional mitigation activities and natural hazards pertaining to Wales. This was the method through which WRHSAC was engaged in the planning process.

In addition, PVPC staff regularly present to their Executive Committee and Commission (representatives from the 43 cities and towns that comprise the Pioneer Valley, when new projects are launched and when funding opportunities are available). As result, all the communities in the region were informed of Wales' Hazard Mitigation Plan update process and encouraged to comment.

PVPC staff included a summary article on the status of Hazard Mitigation planning in the region in the quarterly Regional Reporter that is mailed to area Chambers of Commerce, all member municipalities, area colleges and universities and other key stakeholders in the region. In this way, businesses, educational institutions and other key stakeholders were educated about and informed of Wales' hazard mitigation planning work.

Agencies that have the authority to regulate development

There are two primary Town entities that have the authority to regulate development. These entities are the Planning Board and Capital Improvements Planning Committee. Feedback from these stakeholder agencies was ensured through the participation of the Hazard Mitigation Committee members, who regularly meet and collaborate with members of these entities.

In addition, the Pioneer Valley Planning Commission, as a regional planning authority, works with all agencies that regulate development in Wales, including the municipal entities listed above and state agencies, such as Department of Conservation and Recreation and MassDOT. This regular involvement ensured that during the development of the Wales Hazard Mitigation Plan, the operational policies and any mitigation strategies or identified hazards from these entities were incorporated into the Hazard Mitigation Plan.

Participation by the Public, Businesses, and Neighboring Communities

Two public planning sessions were held as part of the development of the Wales plan – on October 6th, 2014 and January 12th, 2015. Both meetings occurred after the Hazard Mitigation Committee had provided input on hazards and mitigation strategies relevant to the community. Notice of both public meetings was posted at Wales Town Hall in compliance with the Commonwealth of Massachusetts' open meeting law. Public meeting agendas and notices can be found in Appendix B.

On October 1st, 2014, the Pioneer Valley Planning Commission sent a press release to all area media outlets to announce that there would be a first public outreach meeting about the plan on October 6th,

2014. On January 8th, 2015 PVPC sent out a press release indicating that a second public outreach meeting would take place on January 12th, 2015, and also to inform the public that a draft of the Wales Hazard Mitigation Plan had been placed on PVPC's website. The screen capture of PVPC's website showing the link to the press release can be found in Appendix B. The release also indicated that hard copies were available at PVPC's offices and at Wales Town Hall, and that all residents, businesses and other concerned parties of Wales were encouraged to comment on the plan by e-mailing or calling staff contacts at PVPC or the Town.

A list of media organizations that were sent the press releases are included in Appendix B, which are the television stations, radio stations, and newspapers located in western Massachusetts, northern Connecticut, and southern Vermont.

The Hazard Mitigation Committee determined that the most effective outreach strategy for engaging with the public, businesses and neighboring communities was through the media, and so this was the outreach strategy employed for reaching out to all three groups of stakeholders. The press release indicated that residents of Wales were invited to attend the event, which was also intended to include representatives of businesses in Wales and residents of neighboring communities.

Businesses and neighboring communities were also provided with an opportunity to provide feedback through the Pioneer Valley Planning Commission. PVPC is regularly involved in land use, transportation, and environmental planning initiatives in Wales and surrounding communities. Regular feedback received from these other initiatives were incorporated into the hazard mitigation planning process. Neighboring communities that were provided with an opportunity to comment included municipalities that directly border Wales.

Additional outreach to surrounding communities occurred through the regular quarterly newsletter that PVPC sends out to its member communities about its recent activities. In these articles, adjacent municipalities were encouraged to reach out to PVPC about hazard mitigation plans by e-mailing or calling staff contacts at PVPC. These notices are included in Appendix B.

No feedback was received from the public, businesses, or neighboring communities during the planning process. Any future input received from the public, as well as any other stakeholders, will be incorporated into the plan during future regular updates.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process. The Hazard Mitigation Committee will hold all future meetings in accordance with Massachusetts open meeting laws.

Select Board Approval

In 2011, the Select Board agreed to begin the process of developing its first Hazard Mitigation Plan. Once the plan was provisionally approved by FEMA in 2015, the Select Board held a public hearing on the plan and then adopted it.

2: LOCAL PROFILE

Community Setting

Geography

Wales is a rural town approximately 16 square miles in area, located in eastern Hampden County. The town is situated in the uplands east of the Connecticut River Valley and it lies within the Chicopee and Quinebaug River drainage basins. The town is bordered by Brimfield, to the north; Stafford and Union Connecticut, to the south; Holland, to the east; and Monson, to the west. Wales is about 28 miles east of Springfield and 70 miles southwest of Boston.

History

Wales was settled by colonists from Brimfield and Springfield during the mid-18th century. Primarily an agricultural community since its establishment in 1775, the town attracted a number of small industries during the 19th century. Townspeople in Wales farmed and made shoes and boots and in the 19th century the Wales and the Shaw companies made the town an important woolen producing town. The jobs in the mills drew immigrants from Ireland and French Canada. The peak population in 1880 was 1033 people, reflecting this immigration. Residents who didn't work in the mills worked in market gardens, dairy farms and woodlands as some of them continue to do in the 20th century.

The prospering new businesses attracted new residents to the town; however by 1900 all seven of its woolen mills had closed. The town continued to develop slowly, mainly as a popular summer recreation area centered on Lake George. Much of the population remained only during the summer months. The town center of Wales retains a remarkable early 19th century character as a street village with several stylish brick houses and a Greek revival meeting house.

Government

The Town of Wales was incorporated as a town in 1775. Wales is governed by an Open Town Meeting form of government in which any registered voter may participate. Acting as the legislative branch of local government, the Town Meeting enacts bylaws, appropriates the operating budget, and makes other important decisions about the Town's resources and services. An elected three-member Board of Selectmen act as the Town's chief executive officers. A variety of appointed volunteer committees are responsible for budget preparation, policy development, town bylaws, and state codes and regulations, and advisor responsibilities.

Population Characteristics

According to the 2010 U.S. Census, there are 1,838 Wales residents and a total of 882 housing units. The median family income is \$61,118 according to the American Community Survey 2008-12, with 7.6 percent of residents living in poverty.

Economy

According to the American Community Survey 2008 – 12, the majority of Wales' workforce works at jobs outside the town, traveling an average of 38.1 minutes to work each day. According to the Massachusetts Department of Employment and Training, the town is currently home to 35 businesses. The approximate labor force is 1,017, which has stayed relatively the same over the past 10 years. The current unemployment rate is 7.5 percent as of the end of 2013. The town is currently home to 34 businesses.

Climate

Wales is located in eastern Hampden County, where annual rainfall averages 44 inches and is distributed throughout the year. Precipitation is usually adequate for all types of crops in New England; however, brief droughts occasionally occur in sandy soils with lower water capacity. In addition to rain, snowfall averages 40 inches per season. Prevailing winds from the south (and from the north/northwest to a lesser extent) reach their highest average speed during the month of April.

Since 1948, incidents of extreme rainfall events (large amounts of rain in a short period of time) in the U.S. have increased 30 percent. However, New England states have experienced a far greater increase than the national average. In Massachusetts, the increase is 81 percent; upstream on the Connecticut River, New Hampshire is up 115 percent and Vermont is up 84 percent. (Source: Environment America Research & Policy Center, 2012). Extreme rainfall is a cause of flooding, which is a major concern of this plan. In the last five years, there has also been an increased occurrence of tornadoes and large storms that generate strong wind gusts.

Infrastructure

Transportation

The principal highway in Wales is State Route 19, which runs north-south and intersects with U.S. Route 20 in the neighboring town of Brimfield. There are no airports, rail lines, or public transit in the Town of Wales.

Public Water Service

Wales does not have a public water supply, relying instead on numerous on-site private wells located throughout the community, including four non-community water systems which serve a restaurant, lounge, camp, and the public school.

Sewer Service

Wales residents are served by individual, on-site sanitary treatment systems. Stormwater management is also handled on-site although in most cases stormwater management and erosion control have not been addressed formally. Residential homes in this region are suspected of contributing excess nutrients to the lake due to dense residential development and antiquated septic systems.

Waste Disposal

One active solid waste facility is located in town. The Wales Transfer Station, located on Hollow Road has been in operation since 1979 and is managed by the Wales Board of Health. The Wales Dump, formerly located on Ainsworth Road, and the Wales Landfill were closed in 1960 and 1984, respectively and were not lined or capped. The Town of Wales Community Development Plan recommended that soil and groundwater assessments should be conducted if future development is considered in these areas.

Natural Resources

Water Resources

Healthy wetlands, forests, vernal pools, lakes, and ponds play an important role in the environmental and ecological protection of the town, and support some of the most diverse habitats in the Commonwealth. In Wales, residents have been fortunate to have abundant, clean groundwater supplies.

Wales has a mountainous landscape highlighted with steep forested slopes, rivers, and wetlands. Elevations in town range from 1,264 feet above sea level at Mount Pisgah to approximately 600 feet above sea level along Wales Brook. Other significant peaks in Wales include Grandy Hill, Moss Hill, Bear Hill, Mount Hitchcock, and Haynes Hill.

Wetlands and Water Resources

Approximately 150 acres of the town's landscape is covered with surface water. Encompassing 95 acres, Lake George is the largest water body in town followed by the Norcross Ponds and Vinica Pond. Significant streams and river resources include Wales Brook, Vinica Brook, Delphi Brook, Hollow brook, and Stevens Brook.

Wetlands include rivers, ponds, swamps, wet meadows, vernal pools, beaver ponds, and land within the FEMA-defined 100-year flood area. According to data from the Massachusetts Department of Environmental Protection (DEP), there are approximately 700 acres of wetlands in Wales, much of which are wooded. If open waters are included in this accounting, the total acreage of wetlands in Wales rises to nearly 850. Additional wetland areas in town have not yet been identified by MassGIS or USGS maps and must be identified in the field by wetland scientists. Wetland habitats in town occur primarily along the streams and rivers as well as in lands adjacent to major ponds. The most extensive wetland area in town is located in the vicinity of Stevens Brook along the Holland Border

The Massachusetts Wetlands Protection Act (WPA) limits development activity in wetlands that border rivers and streams called bordering vegetated wetlands (BVW). The Massachusetts Rivers Protection Act offers additional protection of lands in the area between 100 feet and 200 feet of the mean high water mark of a qualifying stream or river. However, this outer riparian zone is susceptible to limited development in certain instances.

State law does not protect non-BVWs, called isolated wetlands, unless they are certified vernal pools. Because Wales currently has no local wetlands bylaw, protection of these critical natural areas is not

guaranteed. Historically, and for practical reasons, both wetlands and floodplain development in the town has been limited.

Forests and Fields

The Brimfield State Forest covers much of the northern border of the town while 2,600 acres of the Norcross Wildlife Sanctuary in the southwest portion of Wales. Overall, 85 percent of Wales is forested land. The Brimfield State Forest covers much of the northern border of the town while 2,600 acres of the Norcross Wildlife Sanctuary in the southwest portion of Wales.

Development

Zoning

Zoning is the primary land use tool that the town may use to manage development and direct growth to suitable and desired areas while also protecting critical resources and ensuring that development is in keeping with the town's character.

The Town of Wales is designated as having two districts – the General Rural District, comprising the entire area of the Town, and an overlay district known as the Flood Plain District. The regulations of the Flood Plain District are an addition to the regulations of the General Rural District, not a substitute or alternate.

Although appropriate zoning is all relevant to protecting the health and safety of the town residents, Wales' Flood Plain Overlay District is specifically relevant to natural hazard mitigation. The district applies to those areas within the boundary of the 100-year flood elevations that are considered hazardous according to FEMA. This overlay district encompasses all floodplain areas designated as Zone A or Zones A1-30 on the Town of Wales Flood Insurance Rate map and prohibits the following uses:

1. Industrial uses
2. Junkyards, solid waste landfills, auto salvage and recycling facilities, and dumps
3. Business and industrial uses, not agricultural, involving manufacture, use, processing, storage or disposal of hazardous materials or wastes as a principal activity, including but not limited to metal plating, chemical manufacturing, wood preserving, furniture stripping, dry cleaning and auto body repair
4. The outdoor storage of salt, other de-icing chemicals, pesticides or herbicides, flammable, explosive or toxic materials
5. Excavation or disposal of soil or mineral substances, except as necessary for construction of foundations, utilities or roads

In addition, the Flood Plain Overlay District has several uses that are allowed by special permit including single family residences, utility lines and facilities, and residential accessory uses. The zoning bylaws also establish Special Permit and Site Plan approval procedures for specific uses and structures within Wales. This review allows the Special Permit Granting Authority the ability to review development to ensure that the basic safety and welfare of the people of Wales are protected, and includes several specific evaluation criteria that are relevant to natural hazards.

Current Development Trends

Over 85 percent of the land in town is forested. Residential development is the second most dominant land use with 731 acres (7.2 percent). Cropland and pasture account for three percent of the landscape with commercial and industrial lands accounting for less than 1 percent. While the town maintains a quiet, rural atmosphere, it has lost over 330 acres to development from 1971 to 1999. Over the past 40 years, the town has seen its population more than double while maintain a rural atmosphere. There were 330 acres of development in Wales from 1971 to 1999. Growth of the town in modern times has been in the recreational land around the Brimfield Forest and Lake George, located along Route 19.

Development in Hazard Areas

The 100-year floodplain is defined as an area with a 1 percent chance of flooding in a given year. Areas in the 100-year flood zone are primarily those lands adjacent to and including the open water areas at Lake George, Vinica Brook, Hollow Brook, Wales Brook, Delphi Brook, and Stevens Brook. Flooding of Wales Brook in 2005 caused significant flooding to the Fire Station.

Much of the 100-year flood zone area in Wales is currently open wetland adjacent to large areas in forest cover; however, the floodplain lands surrounding Lake George and Delphi Brook have been developed as seasonal residences.

Compliance with National Flood Insurance Program

Wales is a participating member of the National Flood Insurance Program, and had the following NFIP policy and claim statistics as of October of 2014:

- Flood Insurance Maps (FIRMs) are used for flood insurance purposes and are on file with the Wales Planning Board.
- FIRMs have been effective since July 2, 1981 with the current map in effect since July 16, 2013.
- Wales has 5 in-force policies in effect for a total of \$1,121,000 worth of insurance.
- No NFIP claims have been paid.
- As of 2015, there have been no Repetitive Loss Properties in Wales.
- The Town will maintain compliance with the NFIP throughout the next 5-year Hazard Mitigation Planning cycle by monitoring its Flood Plain Overlay District and ensuring that the district accurately reflects the 100-year flood plain and FEMA Flood Insurance Rate Map (FIRM).

3: HAZARD IDENTIFICATION & RISK ASSESSMENT

The following section includes a summary of disasters that have affected or could affect Wales. Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to develop this list. Identified hazards are the following:

- Floods
- Severe snowstorms / ice storms
- Hurricanes
- Severe thunderstorms / wind /tornadoes
- Wildfires / brushfires
- Earthquakes
- Dam failure
- Drought

Natural Hazard Analysis Methodology

This chapter examines all hazards identified by the Massachusetts State Hazard Mitigation Plan. The analysis is organized into the following sections: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events, Impact, and Vulnerability. A description of each of these analysis categories is provided below.

Hazard Description

The natural hazards identified for Wales are: floods, severe snowstorms/ice storms, hurricanes, severe thunderstorms / wind / tornadoes, wildfire/brushfire, earthquakes, dam failure, and drought. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage.

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 wild fires. Classifications are based on the area that would potentially be affected by the hazard, on the following scale:

Location of Occurrence, Percentage of Town Impacted by Given Natural Hazard	
Location of Occurrence	Percentage of Town Impacted
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

Extent

Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described using an established scientific scale or measurement 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, state-wide, or regional level.

Probability of Future Events

The likelihood of a future event for each natural hazard was classified according to the following scale:

Frequency of Occurrence and Annual Probability of Given Natural Hazard	
Frequency of Occurrence	Probability of Future Events
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

Impact

Impact refers to the effect that a hazard may have on the people and property in the community, based on the assessment of extent described above. Impacts are classified according to the following scale:

Extent of Impacts, Magnitude of Multiple Impacts of Given Natural Hazard	
Extent of Impacts	Magnitude of Multiple Impacts
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

Vulnerability

Based on the above metrics, a hazard index rating was determined for each hazard. The hazard index ratings are based on a scale of 1 through 5 as follows:

- 1 – Highest risk
- 2 – High risk
- 3 – Medium risk
- 4 – Low risk
- 5 – Lowest risk

The ranking is qualitative and is based, in part, on local knowledge of past experiences with each type of hazard. The size and impacts of a natural hazard can be unpredictable. However; many of the mitigation strategies currently in place and many of those proposed for implementation can be applied to the expected natural hazards, regardless of their unpredictability.

Hazard Identification and Risk Analysis for Wales

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Hazard Risk Index Rating
Flooding	Small	High	Limited	2 - High risk
Severe Snowstorms / Ice Storms	Large	High	Limited	2 - High risk
Wildfire / Brushfire	Large	Low	Critical	2 – High risk
Severe Thunderstorms / Winds / Tornadoes	Small	Severe thunderstorms and wind: Moderate Tornadoes: Low	Limited	Severe thunderstorms and wind: 2 – High risk Tornadoes: 4 – Low risk
Hurricanes	Large	Low	Limited	3 - Medium Risk
Earthquakes	Large	Very low	Critical	4 - Low risk
Dam Failure	Medium	Very low	Critical	4 - Low risk
Drought	Large	Low	Minor	5 - Very low risk

Flooding

Hazard Description

There are three major types of storms that can generate flooding in Wales:

- 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 generate very large amounts of rainfall.
- 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.

A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large “sponges” to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into fertile, productive farmland like that found in the Connecticut River valley. In the past, floodplain areas were also often seen as prime locations for development. Industries were located on the banks of rivers for access to hydropower. Residential and commercial development occurred in floodplains because of their scenic qualities and proximity to the water. Although periodic flooding of a floodplain area is a natural occurrence, past and current development and alteration of these areas will result in flooding that is a costly and frequent hazard.

Floods can generally be classified as one of two types: flash floods and general floods.

- **Flash floods** are the product of heavy, localized precipitation in a short time period over a given location. Flash flooding events typically occur within minutes or hours after a period of heavy precipitation, after a dam or levee failure, or from a sudden release of water from an ice jam. Most often, flash flooding is the result of a slow-moving thunderstorm or the heavy rains from a hurricane. In rural areas, flash flooding often occurs when small streams spill over their banks. However, in urbanized areas, flash flooding is often the result of clogged storm drains (leaves and other debris) and the higher amount of impervious surface area (roadways, parking lots, roof tops).
- **General floods** may last for several days or weeks and are caused by precipitation over a longer time period in a particular river basin. Excessive precipitation within a watershed of a stream or river can result in flooding particularly when development in the floodplain has obstructed the natural flow of the water and/or decreased the natural ability of the groundcover to absorb and retain surface water runoff (e.g., the loss of wetlands and the higher amounts of impervious surface area in urban areas).

In addition to flash floods and general floods, the melting of snow and ice in the spring can also generate flooding during this time of year.

Location

There are approximately 3.68 square miles of land within the FEMA mapped 100-year floodplain and 0.52 square miles of land within the 500-year floodplain within the Town of Wales. The floodplain lands surrounding Lake George and Delphi Brook have been developed as seasonal residences. These structures are at risk from flooding during a 100-year storm. The wetlands area west of Walker Road is also in the 100-year floodplain, as is the area immediately bordering Vinica Brook.

In addition, various areas and infrastructure in Wales have issues with localized flooding:

- Route 19, including Fire Department's location at Hegan Street
- Lake George Road
- Walker Road

Based on these locations, flooding has a "small" location of occurrence, with less than 10 percent of land area affected.

Extent

The average annual precipitation for Wales and surrounding areas in western Massachusetts is 46 inches. The Hazard Mitigation Committee indicated that all locations of localized flooding can receive high water marks of up to several feet during sufficiently large rainstorms.

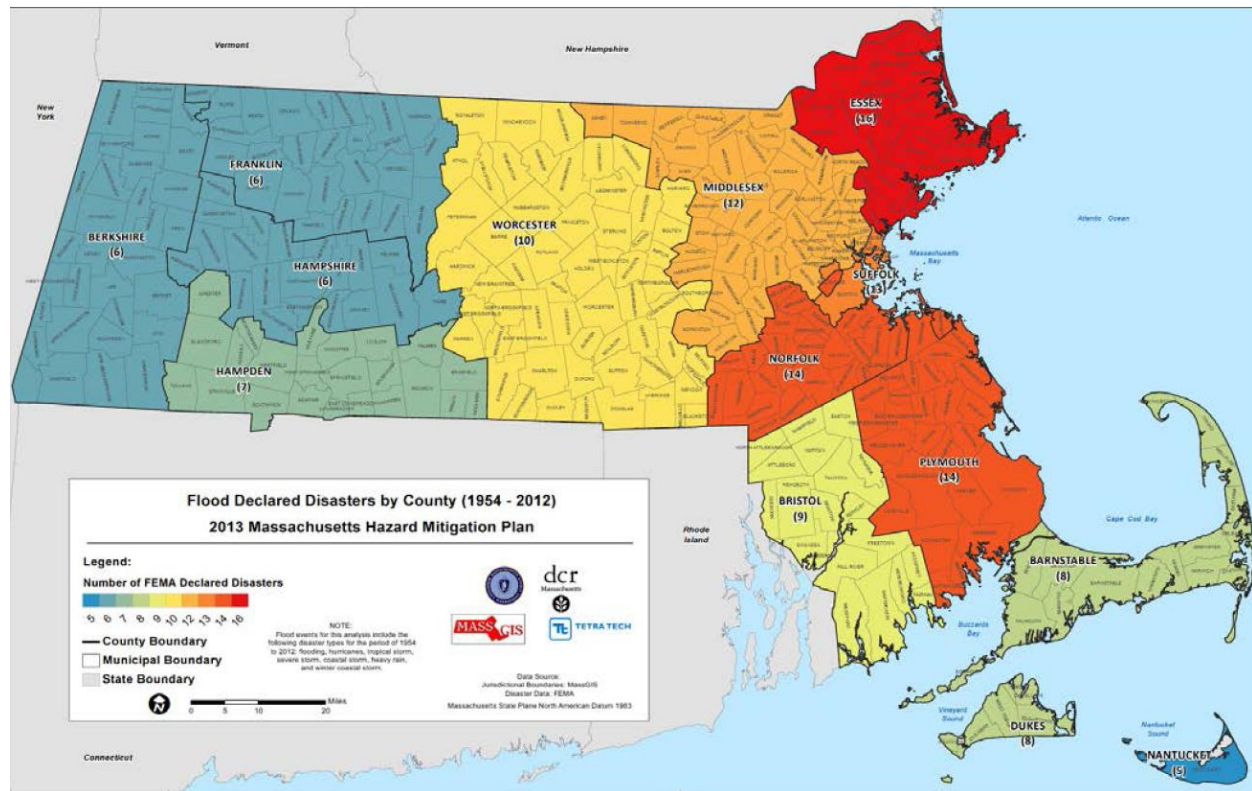
Previous Occurrences

The major floods recorded in Wales have been the result of rainfall alone or rainfall combined with snowmelt. Previous flooding events include:

- Flooding of Wales Brook in 2005 caused over a foot of flooding in the nearby Fire Station.
- Residual flooding from Hurricane Katrina in 2005 caused too much water and resulted in many nearby waterways being flooded.
- Hurricane Bob in 1991 and Tropical Storm Irene in 2011 caused the washing out of several catch basins throughout town.
- Many of the town's 95 culverts are washed out on a regular basis.

In addition, since 1954, there have been 7 FEMA flood declared disasters in Hampden County, as shown in the map below.

FEMA Flood Declared Disasters by County, 1954-2012



Source: Massachusetts Hazard Mitigation Plan

Probability of Future Events

Based upon previous data, there is a "high" chance (between 40 percent and 70 percent in any given year) of flash flooding or general flooding occurring in Wales. Flooding frequencies for the various floodplains in Wales are defined by FEMA as the following:

- 10-year floodplain – 10 percent chance of flooding in any given year
- 25-year floodplain – 2.5 percent chance of flooding in any given year
- 100-year floodplain – 1 percent chance of flooding in any given year
- 500-year floodplain – 0.2 percent chance of flooding in any given year

Climate scientists predict that in the next few decades, climate change will increase the frequency and intensity of all storms that can cause flooding. Currently, floods are the most costly natural hazard in the United States, and climate change will only increase this damage. More information about the effect of

Climate Change can be found in the Pioneer Valley Planning Commission's Climate Action Plan, available at www.sustainableknowledgecorridor.org.

Impact

The Town faces a “limited” impact from flooding, with 10 percent or more of property damaged in the affected area. The floodplain lands surrounding Lake George and Delphi Brook have been developed as seasonal residences with approximately 20 homes located in the area that could flood. These structures are at risk from flooding during a 100-year storm.

To approximate the potential impact to property and people that could be affected by this hazard, the 2012 median sale price for a home of \$125,000 was used. If there was 30% damage to the 20 homes located in the area, that would result in \$750,000 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above analysis, Wales has a hazard index rating of “2 – high risk” from flooding.

Severe Snowstorms / Ice Storms

Hazard Description

Severe winter storms can pose a significant risk to property and human life. The rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can cause the following hazards:

- Disrupted power and phone service
- Unsafe roadways and increased traffic accidents
- Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt.
- Tree damage and fallen branches that cause utility line damage and roadway blockages
- Damage to telecommunications structures
- Reduced ability of emergency officials to respond promptly to medical emergencies or fires.

Location

The entire town of Wales is susceptible to severe snowstorms. Because these storms occur regionally, they impact the entire town. The town has particular problems with snow and ice removal on its gravel roads. Based on this assessment, the location of occurrence from snow storms and ice storms in Wales is “large,” with over 50 percent of the town affected.

The town has had ice problems on the following roadways:

- Mt. Hitchcock Road
- Monson Road (at intersection with McBride)
- McBride Road
- Haynes Hill Road near ice house
- Hollow Road (due to steep grade and north-facing orientation)
- Stafford - Holland Road

The following areas have been identified by the Hazard Mitigation Committee as areas where snow drifts form during winter storm events:

- Areas near Mt. Hitchcock Road
- Route 19 adjacent to Lake George Dam
- Roads off of Union Road near Lake George

Extent

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10-inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from

other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

NESIS scores are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the path of the storm. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which varies from around one for smaller storms to over ten for extreme storms. The raw score is then converted into one of the five NESIS categories. The largest NESIS values result from storms producing heavy snowfall over large areas that include major metropolitan centers.

Northeast Snowfall Impact Scale Categories		
Category	NESIS Value	Description
1	1—2.499	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10.0+	Extreme

Source: <http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

Previous Occurrences

Wales generally experiences at least one or two severe winter storms each year with varying degrees of severity. Severe winter storms typically occur during January and February; however, they can occur from late September through late May.

Based on data available from the National Oceanic and Atmospheric Administration, there are 47 winter storms since 1958 that have registered on the NESIS scale. Of these, approximately 26 storms resulted in snow falls in the Pioneer Valley of at least 10 inches. These storms are listed in the table on the next page, in order of their NESIS severity.

Winter Storms Producing Over 10 inches of Snow in the Pioneer Valley, 1958-2013			
Date	NESIS Value	NASIS Category	NESIS Classification
3/12/1993	13.2	5	Extreme
3/2/1960	8.77	4	Crippling
2/15/2003	7.5	4	Crippling
2/2/1961	7.06	4	Crippling
1/21/2005	6.8	4	Crippling
1/19/1978	6.53	4	Crippling
12/25/1969	6.29	4	Crippling
2/10/1983	6.25	4	Crippling
2/14/1958	6.25	4	Crippling
2/5/1978	5.78	3	Major
2/23/2010	5.46	3	Major
2/8/1994	5.39	3	Major
1/9/2011	5.31	3	Major
2/18/1972	4.77	3	Major
12/11/1960	4.53	3	Major
2/7/2013	4.35	3	Major
2/22/1969	4.29	3	Major
1/18/1961	4.04	3	Major
2/8/1969	3.51	2	Significant
2/5/1967	3.5	2	Significant
4/6/1982	3.35	2	Significant
3/4/2013	3.05	2	Significant
3/15/2007	2.54	2	Significant
3/31/1997	2.29	1	Notable
2/2/1995	1.43	1	Notable
1/25/1987	1.19	1	Notable

Source: <http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

While NESIS provides a guide to the historical snowstorms that have affected Wales' region, there are wide variations that can occur locally. This is a result of Wales altitude and the variations in snowfall that can occur based on even a one or two degree temperature difference from lower, surrounding areas.

For example, the storm on February 7, 2013, was locally very severe, with over 36 inches of snowfall in Wales. A similarly large storm occurred a month later, on March 4, 2013. In addition, the October snow fall of 2011 caused over 15 inches of snow, and many downed trees and branches due to the fact that leaves had not yet fallen.

Probability of Future Events

Based upon the availability of records for Hampden County, the likelihood that a severe snow storm will affect Wales is “high” (between 40 and 70 percent in any given year).

Research on climate change indicates that there is great potential for stronger, more frequent storms as the global temperature increases. More information about the effect of Climate Change can be found in the Pioneer Valley Planning Commission’s Climate Action Plan, available at www.sustainableknowledgecorridor.org.

The Massachusetts State Climate Change Adaptation Report has additional information about the impact of climate change and can be accessed at www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html.

Impact

The town faces a “limited” impact from snowstorms, or 10 percent or more of property damaged in the affected area.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, \$201,133,900, is used. An estimated 20 percent of damage would occur to 10 percent of structures, resulting in a total of \$4,022,678 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above assessment, Wales has a hazard index rating of “2 - high risk” from snowstorms and ice storms.

Hurricanes

Hazard Description

Hurricanes are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. The primary damaging forces associated with these storms are high-level sustained winds and heavy precipitation. Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour and which generate large amounts of precipitation. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground utilities.

Location

Because of the hazard's regional nature, all of Wales is at risk from hurricanes, meaning the location of occurrence is "large," or more than 50 percent of land area affected. Ridgetops are more susceptible to wind damage.

Extent

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Hurricane Wind Scale, which rates hurricane wind intensity on a scale of 1 to 5, with 5 being the most intense.

SAFFIR-SIMPSON SCALE	
Category	Maximum Sustained Wind Speed (MPH)
1	74–95
2	96–110
3	111–129
4	130–156
5	157 +

Source: National Hurricane Center, 2012

Previous Occurrences

Hurricanes that have affected Wales are show in the following table.

Major Hurricanes Affecting Wales		
Hurricane/Storm Name	Year	Saffir/Simpson Category (when reached MA)
Great Hurricane of 1938	1938	3
Great Atlantic Hurricane	1944	1
Carol	1954	3
Edna	1954	1
Diane	1955	Tropical Storm
Donna	1960	Unclear, 1 or 2
Groundhog Day Gale	1976	Not Applicable
Gloria	1985	1
Bob	1991	2
Floyd	1999	Tropical Storm
Irene	2011	Tropical Storm
Sandy	2012	Super Storm

Of these storms, the heaviest damages to the town were incurred from the heavy rainfall and flooding during Hurricane Bob and Tropical Storm Irene. Hurricane Sandy did not cause significant damage locally.

Probability of Future Events

Wales' location in western Massachusetts reduces the risk of extremely high winds that are associated with hurricanes, although it can experience some high wind events. Based upon past occurrences, it is reasonable to say that there is a "low" probability of hurricanes or tropical storms in Wales, or between a 1 and 10 percent chance, in any given year.

Impact

A description of the damages that could occur due to a hurricane is described by the Saffir-Simpson scale, as shown below.

Hurricane Damage Classifications			
Storm Category	Damage Level	Description of Damages	Wind Speed (MPH)
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage. An example of a Category 1 hurricane is Hurricane Dolly (2008).	74-95
	Very dangerous winds will produce some damage		
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings. An example of a Category 2 hurricane is Hurricane Francis in 2004.	96-110
	Extremely dangerous winds will cause extensive damage		
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland. An example of a Category 3 hurricane is Hurricane Ivan (2004).	111-129
	Devastating damage will occur		
4	EXTREME	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. An example of a Category 4 hurricane is Hurricane Charley (2004).	130-156
	Catastrophic damage will occur		
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required. An example of a Category 5 hurricane is Hurricane Andrew (1992).	157+
	Catastrophic damage will occur		

The Town faces a “limited” impact from hurricanes, with 10 percent or more of property damaged in the affected area.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, \$201,133,900, is used.

Wind damage of 5 percent to 10 percent of structures damaged would result in an estimated \$1,005,669 of damage. Estimated flood damage to 10 percent of the structures with 20 percent damage to each structure would result in \$4,022,678 of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above analysis, Wales has a hazard index rating of “3 – medium risk” from hurricanes.

Severe Thunderstorms / Wind / Tornadoes

Hazard Description

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. Effective January 5, 2010, the NWS modified the hail size criterion to classify a thunderstorm as "severe" when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado (NWS, 2013).

Wind is air in motion relative to the surface of the earth. For non-tropical events over land, the NWS issues a Wind Advisory (sustained winds of 31 to 39 mph for at least 1 hour or any gusts 46 to 57 mph) or a High Wind Warning (sustained winds 40+ mph or any gusts 58+ mph). For non-tropical events over water, the NWS issues a small craft advisory (sustained winds 25-33 knots), a gale warning (sustained winds 34-47 knots), a storm warning (sustained winds 48 to 63 knots), or a hurricane force wind warning (sustained winds 64+ knots). For tropical systems, the NWS issues a tropical storm warning for any areas (inland or coastal) that are expecting sustained winds from 39 to 73 mph. A hurricane warning is issued for any areas (inland or coastal) that are expecting sustained winds of 74 mph. Effects from high winds can include downed trees and/or power lines and damage to roofs, windows, etc. High winds can cause scattered power outages. High winds are also a hazard for the boating, shipping, and aviation industry sectors.

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along a path that ranges from a few dozen yards to over a mile in width. The path of a tornado may be hard to predict because they can stall or change direction abruptly. Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester, including towns in eastern Hampshire County. High wind speeds, hail, and debris generated by tornadoes can result in loss of life, downed trees and power lines, and damage to structures and other personal property.

Location

As per the Massachusetts Hazard Mitigation Plan, the entire town is at risk of high winds, severe thunderstorms, and tornadoes. The plan also identifies Wales and the surrounding communities as having a high frequency of tornado occurrence within Massachusetts. However, the actual location of occurrence of a thunderstorm, severe wind, or tornado is "small," with less than 10 percent of the town affected.

Extent

An average thunderstorm is 15 miles across and lasts 30 minutes; severe thunderstorms can be much larger and longer. Tornadoes are measured using the enhanced F-Scale.

The damages that tornadoes and severe wind can create is shown with the following F-Scale categories and corresponding descriptions of damage:

Enhanced Fujita Scale Levels and Descriptions of Damage			
EF-Scale Number	Intensity Phrase	3-Second Gust (MPH)	Type of Damage Done
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	Moderate	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

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. Thunderstorms can cause hail, wind, and flooding.

Rainfall records for a 24-hour period and per month are listed below:

Rainfall Records for Wales, MA		
Month	24-Hour Record	Monthly Record
January	2.8"	8.9"
February	3.23"	7.68"
March	2.8"	7.72"
April	3.55"	8.75"
May	3.62"	11.54"
June	3.74"	10.4"
July	4.33"	9.73"
August	7.56"	18.68"
September	7.68"	3.23"
October	3.39"	9.06"
November	2.44"	7.56"
December	2.99"	7.25"

<http://www.myforecast.com/bin/climate.m?city=572112&metric=false>

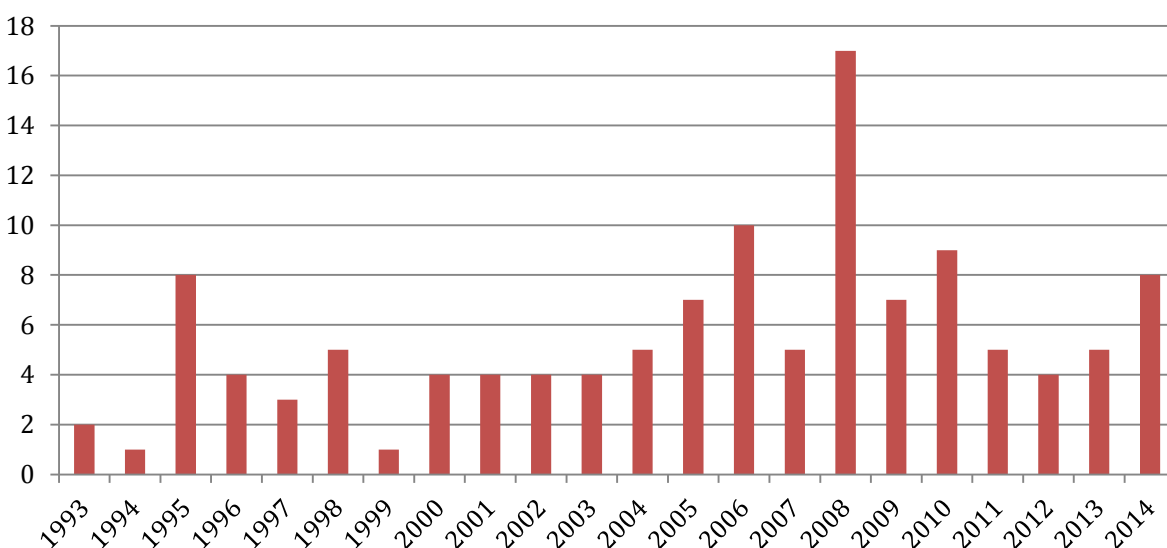
Previous Occurrences

Because thunderstorms and wind affect the town regularly on an annual basis, there are not significant records available for these events. As per the Massachusetts Hazard Mitigation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year.

For tornadoes, there are typically 1 to 3 tornadoes somewhere in southern New England per year. Most occur in the late afternoon and evening hours, when the heating is the greatest. The most common months are June, July, and August, but the Great Barrington, MA tornado (1995) occurred in May and the Windsor Locks, CT tornado (1979) occurred in October.

Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester. In 2011, a tornado ranked F3 (Severe Damage) on the Fujita Scale of Tornado Intensity, blew through the towns of West Springfield, Westfield, Springfield, Monson, Wilbraham, Brimfield, Sturbridge, and Southbridge. The tornado and related storm killed 3 people and resulted in hundreds of injuries across the state.

The number of severe thunderstorms in Hampden County that included winds over 50 miles per hour, since 1993, are included in the table below. On average, since 1993, there have been between 5-6 severe thunderstorms per year.



Source: NOAA Storm Events Database, 2014, www.ncdc.noaa.gov/stormevents/

Probability of Future Events

One measure of tornado activity is the tornado index value. It is calculated based on historical tornado events data using USA.com algorithms. It is an indicator of the tornado level in a region. A higher tornado index value means a higher chance of tornado events. Data was used for Hampden County to determine the Tornado Index Value as shown in the table below.

Tornado Index for Hampden County	
Hampden County	138.23
Massachusetts	87.60
United States	136.45

Source: USA.com

<http://www.usa.com/hampden-county-ma-natural-disasters-extremes.htm>

Based upon the available historical record, as well as Wales' location in a high-density cluster of state-wide tornado activity, it is reasonable to estimate that there is a "low" probability of tornado occurrence (1 to 10 percent chance in any given year).

As per the Massachusetts Hazard Mitigation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year. Thus, there is a "moderate" probability (10 percent to 40 percent chance in any given year) of a severe thunderstorm or winds affecting the town.

Impact

Overall, the Town faces a "limited" impact from severe thunderstorms, winds, or tornadoes with 10 percent or more of the town affected. The potential for locally catastrophic damage is a factor in any severe weather event. In Wales, a tornado that hit residential areas would leave much more damage than a tornado with a travel path that ran along the town's forested areas, where little settlement has occurred. Most buildings in town have not been built to Zone 1, Design Wind Speed Codes. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, with most of the town's housing built before this date.

To approximate the potential impact to property and people that could be affected by severe weather, tornado, or wind, the total value of all property in town, \$201,133,900 is used. For a tornado, an estimated 100 percent of damage would occur to 1 percent of structures, resulting in a total of \$2,011,339 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate. For a severe thunderstorm or wind, an estimated 20 percent of damage would occur to 10 percent of structures, resulting in a total of \$4,022,678 worth of damage.

Vulnerability

Based on the above assessment, Wales has a hazard index rating of "2 – high risk" from severe thunderstorms and winds, and a "4 – low risk" from tornadoes.

Wildfire / Brushfire

Hazard Description

Wildland fires are typically larger fires, involving full-sized trees as well as meadows and scrublands. Brushfires are uncontrolled fires that occur in meadows and scrublands, but do not involve full-sized trees. Both wildland fires and brushfires can consume homes, other buildings and/or agricultural resources. Typical causes of brushfires and wildfires are lightning strikes, human carelessness, and arson.

FEMA has classifications for 3 different classes of wildland fires:

- Surface fires are the most common type of wildland fire and burn slowly along the floor of a forest, killing or damaging trees.
- Ground fires burn on or below the forest floor and are usually started by lightning
- Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions.

The wildfire season in Massachusetts usually begins in late March and typically culminates in early June, corresponding with the driest live fuel moisture periods of the year. April is historically the month in which wildfire danger is the highest. However, wildfires can occur every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires.

Location

Hampden County has approximately 273,000 acres of forested land, which accounts for 67 percent of total land area. In Wales 85 percent of the land is forested, and is therefore at risk of fire. A large wildfire could damage almost all of the town's land mass in a short period of time. However, Massachusetts receives more than 40 inches of rain per year and much of the landscape is fragmented, and together these two traits make wildfires uncommon in Massachusetts. Nevertheless, in drought conditions, a brushfire or wildfire would be a matter of concern. There is forest very near all areas of Wales, making the entire town susceptible to wildfire and brushfire, and meaning the location of occurrence from this hazard is "large," or affecting more than 50 percent of the town.

Extent

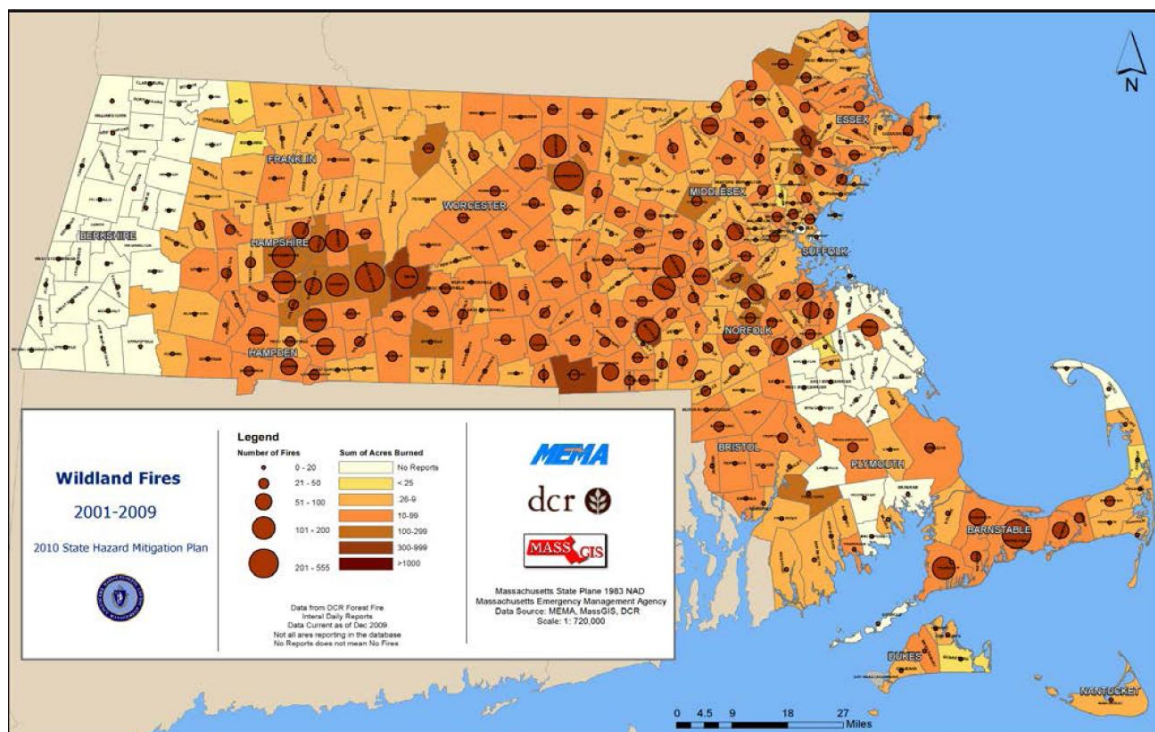
Wildfires and brushfires can cause widespread damage to the areas that they affect. They can spread very rapidly, depending on local wind speeds and be very difficult to get under control. Fires can last for several hours up to several days. There are approximately 8,704 acres of forested area in the town that are at risk of a wildfire or brushfire.

Previous Occurrences

During the past 100 years, there have not been many wildfires occurring in the Pioneer Valley. However, several have occurred during the past 20 years, as shown in the list below:

- 1995 – Russell, 500 acres burned on Mt. Tekoa
- 2000 – South Hadley, 310 acres burned over 14 days in the Litchia Springs Watershed
- 2001 – Ware, 400 acres burned
- 2010 – Russell, 320 acres burned on Mt. Tekoa
- 2012 – Eastern Hampden County, dry conditions and wind gusts created a brush fire in Brimfield, and burned 50 acres
- 2012 - Brimfield, 52 acres burned in Brimfield State Forest, as a result of the large number of dead trees and brush produced by the 2011 tornado

Wildland Fires in Massachusetts, 2001-2009



Source: Massachusetts Hazard Mitigation Plan

Probability of Future Events

In accordance with the Massachusetts Hazard Mitigation Plan, the Wales Hazard Mitigation Committee found it is difficult to predict the likelihood of wildfires in a probabilistic manner because the number of variables involved. However, given the proximity of previous wildfires, and their proximity to the town, the likelihood of a future wildfire or brushfire is determined to "low," or between a 1 to 10 percent change in any given year.

Climate scenarios project summer temperature increases between 2°C and 5°C and precipitation decreases of up to 15 percent. Such conditions would exacerbate summer drought and further promote high-elevation wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases. Forest response to increased atmospheric carbon dioxide—the so-called “fertilization effect”—could also contribute to more tree growth and thus more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown.

Impact

The town faces a “critical” impact from wildfire or brushfire, with over 25 percent of property in the affected area damaged or destroyed.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, \$201,133,900, is used.

An estimated 100 percent of damage would occur to 25 percent of structures, resulting in a total of \$50,283,475 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above assessment, Wales has a hazard risk index of “2 - high risk” from wildfires or brushfire.

Earthquakes

Hazard Description

An earthquake is a sudden, rapid shaking of the ground that is caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly, without warning, at any time of the year. New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.¹ Ground shaking from earthquakes can rupture gas mains and disrupt other utility service, damage buildings, bridges and roads, and trigger other hazardous events such as avalanches, flash floods, dam failure, and fires. Un-reinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated, unstable soil, and mobile homes not tied to their foundations are at risk during an earthquake.²

Location

Because of the regional nature of the hazard, the entire town is equally susceptible to earthquakes and the location of occurrence is "large," with over 50 percent of land affected.

Extent

The magnitude of an earthquake is measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations recorded on the seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) increases the energy more than 30 times. The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII, with I denoting a weak earthquake and XII denoting a earthquake that causes almost complete destruction.

Richter Scale Magnitudes and Effects	
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.

¹ Northeast States Emergency Consortium Web site: www.nesec.org/hazards/earthquakes.cfm.

² Federal Emergency Management Agency Web site: www.fema.gov/hazards/earthquakes/quake.shtm.

Modified Mercalli Intensity Scale for and Effects			
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 uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; 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

Source: US Federal Emergency Management Agency

Previous Occurrences

The most recent earthquakes to affect Wales are shown in the table below.

Largest Earthquakes Affecting Wales, 1924 – 2014		
Location	Date	Magnitude
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Plattsburg, NY	April 20, 2002	5.1
Bar Harbor, NH	October 3, 2006	4.2
Hollis Center, ME	October 16, 2012	4.6

Source: Northeast States Emergency Consortium website, www.nesec.org/hazards/earthquakes.cfm

New England States Record of Historic Earthquakes		
State	Years of Record	Number Of Earthquakes
Connecticut	1668 - 2007	137
Maine	1766 - 2007	544
Massachusetts	1668 - 2007	355
New Hampshire	1638 - 2007	360
Rhode Island	1776 - 2007	38
Vermont	1843 - 2007	73
New York	1840 - 2007	755
<i>Total Number of Earthquakes within the New England states between 1638 and 1989 is 2262.</i>		

Source: Northeast States Emergency Consortium website, www.nesec.org/hazards/earthquakes.cfm

Probability of Future Events

One measure of earthquake activity is the Earthquake Index Value. It is calculated based on historical earthquake events data using USA.com algorithms. It is an indicator of the earthquake activity level in a region. A higher earthquake index value means a higher chance of earthquake events. Data was used for Hampden County to determine the Earthquake Index Value as shown in the table below.

Earthquake Index for Hampden County	
Hampden County	0.24
Massachusetts	0.70
United States	1.81

Based upon existing records, there is a "very low" likelihood of earthquakes in Wales, with less than a 1 percent chance of an earthquake occurring in any given year.

Impact

Massachusetts introduced earthquake design requirements into their building code in 1975 and improved building code for seismic reasons in the 1980s. However, these specifications apply only to new buildings or to 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. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

The town faces a "critical" impact from earthquakes, with more than 25 percent of Wales affected. To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, \$201,133,900 is used. An estimated 100 percent of damage would occur to 25 percent of structures, resulting in a total of \$50,283,475 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

In addition, the Tennessee Pipeline, which travels through Wales, has a pump station located near the center of town. While unlikely, it is possible the pipeline ruptured or pump station damaged during an earthquake, result in the release of large amounts of natural gas that would pose a large fire hazard.

Vulnerability

Based on the above analysis, Wales has a hazard index rating of "4 – low risk" from earthquakes.

Dam Failure

Hazard Description

Dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control. However, they also pose a potential risk to lives and property. Dam failure is not a common occurrence, but dams do represent a potentially disastrous hazard. When a dam fails, the potential energy of the stored water behind the dam is released rapidly. Most dam failures occur when floodwaters above overtop and erode the material components of the dam. Often dam breaches 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 will depend upon 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.

Many dams in Massachusetts were built during the 19th Century without the benefit of modern engineering design and construction oversight. Dams of this age can fail because of structural problems due to age and/or lack of proper maintenance, as well as from structural damage caused by an earthquake or flooding.

The Massachusetts Department of Conservation and Recreation Office of Dam Safety is the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). To be regulated, these dams are in excess of 6 feet in height (regardless of storage capacity) and have more than 15 acre feet of storage capacity (regardless of height). Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the State of Massachusetts to dam owners, including the responsibility to conduct dam inspections.

Location

The Massachusetts Emergency Management Agency (MEMA) identifies 11 dams in Wales. The location of occurrence for dam failure is considered to be “medium,” with 10 to 50 percent of the Town affected.

Dams in Wales	
Dam	Hazard Level
Lake George Dam	Significant
Shawville Dam	Significant
Squires Dam	Significant
D.S. Maynard Pond Dam	NA
Norcross Pond #1 Dam	Low
Norcross Pond #2 Dam	Low
Norcross Pond #3 Dam	Low
Norcross Pond #4 Dam	NA
Trout Pond Dam	NA
Vinica Pond Dam	Low
Delphi Brook Dam	NA

Source: MassGIS

Extent

Often dam breaches lead to catastrophic consequences as the water ultimately 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 will depend upon 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:

- *High Hazard:* Dams located where failure or improper operation will likely 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, 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.

Previous Occurrences

To date, there have been no dam failures in Wales.

Probability of Future Events

As Wales’ dams age, and if maintenance is deferred, the likelihood of a dam failure will increase, but, currently the frequency of dam failures is “very low,” with a less than 1 percent chance of a dam failing in any given year.

As described in the Massachusetts Hazard Mitigation Plan, dams are designed partly based on assumptions about a river’s flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream. Throughout the west, communities downstream of dams are already increases in stream flows from earlier releases from dams. Dams are constructed with safety features known as “spillways.” Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as “design failures,” result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Impact

The town faces a “critical” impact from failure of dam, with over 25 percent of property damaged or destroyed within the affected area. To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, \$201,133,900, is used.

An estimated 100 percent of damage would occur to 25 percent of structures, resulting in a total of \$50,283,475 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

The Town's Hazard Mitigation Committee estimates that a failure of the Shawville Dam would result in complete destruction of the Town's Fire Department and Route 19. However, the dam was rebuilt in 2004 and is very unlikely to fail.

Vulnerability

Based on this analysis, Wales has a hazard index rating of “4 – low risk” from dam failure.

Drought

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of the direct impacts of drought. Of course, these impacts can have far-reaching effects throughout the region and even the country.

Location

Because of this hazard's regional nature, a drought would impact the entire town, and the location of occurrence is "large," with over 50 percent of total land affected.

Extent

The severity of a drought would determine the scale of the event and would vary among town residents depending on whether the residents' water supply is derived from a private well or the public water system.

The U.S. Drought Monitor also records information on historical drought occurrence. Unfortunately, data could only be found at the state level. The U.S. Drought Monitor categorizes drought on a D0-D4 scale as shown below.

U.S. Drought Monitor		
Classification	Category	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, 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 creating water emergencies

Source: US Drought Monitor, <http://droughtmonitor.unl.edu/classify.htm>

Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930.³ They range in severity and length, from three to eight years. In many of these droughts, water-supply systems were found to be inadequate. Water was piped in to urban areas, and water-supply systems were modified to permit withdrawals at lower water levels. The following table indicates previous occurrences of drought since 2000, based on the US Drought Monitor:

Annual Drought Status	
Year	Maximum Severity
2000	No drought
2001	D2 conditions in 21% of the state
2002	D2 conditions in 99% of the state
2003	No drought
2004	D0 conditions in 44% of the state
2005	D1 conditions in 7% of the state
2006	D0 conditions in 98% of the state
2007	D1 conditions in 71% of the state
2008	D0 conditions in 57% of the state
2009	D0 conditions in 44% of the state
2010	D1 conditions in 27% of the state
2011	D0 conditions in 0.01% of the state
2012	D2 conditions in 51% of the state

Source: US Drought Monitor

Wales has not been impacted by any previous droughts in the state.

Probability of Future Events

In Wales, as in the rest of the state, drought occurs at a “low” probability, which means the likelihood is between 1 percent and 10 percent in any given year.

Based on past events and current criteria outlined in the Massachusetts Drought Management Plan, it appears that western Massachusetts may be more vulnerable than eastern Massachusetts to severe drought conditions. However, many factors, such as water supply sources, population, economic factors (i.e., agriculture based economy), and infrastructure, may affect the severity and length of a drought event. When evaluating the region’s risk for drought on a national level, utilizing a measure called the Palmer Drought Severity Index, Massachusetts is historically in the lowest percentile for severity and risk of drought.⁴ However, global warming and climate change may have an effect on drought risk in the region. With the projected temperature increases, some scientists think that the global hydrological cycle will also intensify. This would cause, among other effects, the potential for more severe, longer-lasting droughts.

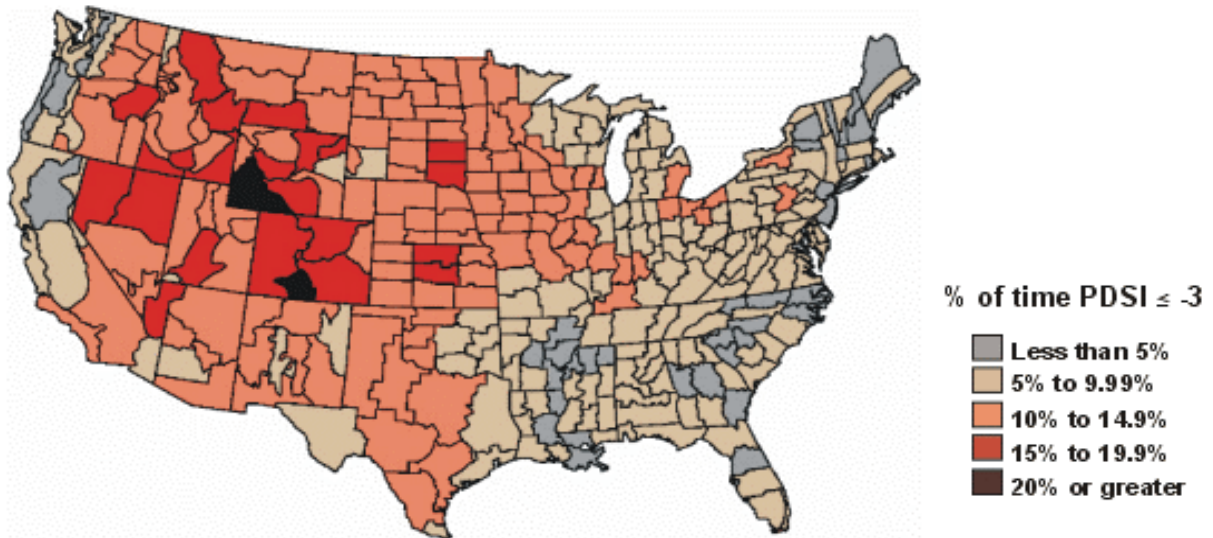
³ US Geological Survey Water-Supply Paper 2375. “National Water Summary 1989 – Floods and Droughts: Massachusetts.” Prepared by S. William Wandle, Jr., US Geological Survey.

⁴ National Drought Mitigation Center – <http://drought.unl.edu>

Palmer Drought Severity Index

1895–1995

Percent of time in severe and extreme drought



Impact

Due to the water richness of western Massachusetts, Wales is unlikely to be adversely affected by anything other than a major, extended drought. While such a drought would require water saving measures to be implemented, there would be no foreseeable damage to structures or loss of life resulting from the hazard. Because of this, the impact of a drought to Wales is considered "minor."

Vulnerability

Based on the above assessment, Wales has a hazard index rating of "5 – very low risk" from drought.

Other Hazards

In addition to the hazards identified above, the Hazard Mitigation Team reviewed the full list of hazards listed in the Massachusetts Hazard Mitigation Plan. Due to the location and context of the town, coastal erosion, landslides, and tsunamis, were determined to not be a threat.

Extreme temperatures, while identified in the Massachusetts Hazard Mitigation Plan, was determined by the Wales Hazard Mitigation Committee to not currently be a primary hazard to people, property, or critical infrastructure in Wales. While extreme temperatures can result in increased risk of wildfire, this effect is addressed as part of the “Wildfire/Brushfire” hazard assessment. As described in the hazard assessment of climate change, extreme temperatures are likely to have a larger effect on the town in the future. The Hazard Mitigation Committee will continue to assess the impact of extreme temperature and update the Hazard Mitigation Plan accordingly.

4: CRITICAL FACILITIES

Facility Classification

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort
- Maintains an existing level of protection from hazards for community residents and property
- Would create a secondary disaster if a hazard were to impact it

The Critical Facilities List for the Town of Wales has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Wales' Hazard Mitigation Committee has broken up this list of facilities into three categories:

- Facilities needed for emergency response in the event of a hazard event.
- Facilities identified as non-essential and not required in an emergency response event, but which are considered essential for the everyday operation of the Town.
- Facilities or institutions that include special populations which would need additional attention in the event of a hazard event.

The critical facilities and evacuation routes potentially affected by hazard areas are identified following this list. The Past and Potential Hazards/Critical Facilities Map (Appendix D) also identifies these facilities.

Category 1 – Emergency Response Facilities

The Town has identified the emergency response facilities as the highest priority in regards to protection from natural hazards:

- Emergency Operations Center
Fire Station at 3 Hegan Street
- Fire Department – Fire Station has experienced flooding during torrential storms
3 Hegan Street
- Police Department
Town Hall at 3 Hollow Road
- Department of Public Works
Fire Station at 3 Hegan Street
- Water Department
NA
- Fuel Stations
Diesel located at Fire Station (3 Hegan Street)
- Facilities with Backup Power
Norcross Wildlife Sanctuary at 30 Peck Road
Fire Station at 3 Hegan Street
Town Hall at 3 Hollow Road
- Emergency Shelters
Norcross Wildlife Sanctuary at 30 Peck Road
- Helicopter Landing Sites (Lifeflight-Lifestar preapproved)
Wales Elementary School at 41 Main Street
Barney Road
- Communications
Telecommunications tower at Holland Road near Stafford Road
- Hospitals
None
- Primary Evacuation Routes
Route 19 - Stafford Road

Category 2 – Non-Emergency Response Facilities

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Wales.

- Public Water Supply
NA
- Drinking Water Treatment Plants
NA
- Water Storage
500 gallon storage tank at Wales Elementary School, 41 Main Street
- Waste Water Treatment Plants
NA
- Critical Culverts (roads with stream crossings)
Peck Road near Vinica Brook
Holland Road near Stafford Road
Sizer Drive

Category 3 – Facilities / Institutions with Special Populations

The Town has identified these facilities as the location of populations who may need special attention during a hazard event.

- Special Needs Population
Day-time facility for approximately 14 people located on Sizer Drive
- Elderly Housing/Assisted Living
None
- Public Buildings/Areas
Public Library at 77 Main Street
- Schools
Wales Elementary School at 41 Main Street
- Places of Worship
Wales Baptist Church at 28 Main Street

5: MITIGATION STRATEGIES

One of the steps of this Hazard Mitigation Plan is to evaluate all of the Town's existing policies and practices related to natural hazards and identify potential gaps in protection. After reviewing these policies and the hazard identification and assessment, the Town Hazard Mitigation Committee developed a set of hazard mitigation strategies it would like to implement.

The Town of Wales has developed the following goal to serve as a framework for mitigation of the hazards identified in this plan.

Goal Statement

To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to the following hazards: flooding, severe snowstorms/ice storms, severe thunderstorms, hurricanes, tornadoes, wildfires/brushfires, earthquakes, dam failures, and drought.

For the extent of this analysis, the Committee reviewed the following Town documents:

- Zoning By-Laws
- Subdivision Rules and Regulations
- Comprehensive Emergency Management Plan
- Town Open Space and Recreation Plan

Overview of Mitigation Strategies by Hazard

An overview of the general concepts underlying mitigation strategies for each of the hazards identified in this plan is as follows:

Flooding

The key factors in flooding are the water capacity of water bodies and waterways, the regulation of waterways by flood control structures, and the preservation of flood storage areas and wetlands. As more land is developed, more flood storage is demanded of the town's water bodies and waterways. The Town currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the Town's zoning bylaw and subdivision regulations, such as ensuring adequate driveway drainage, restricting development in the floodplain, requiring drainage easements where applicable for subdivisions, and following the Wetlands Protection Act. The Town also regularly assesses the condition of road infrastructure to determine if it has been damaged by flooding. Additionally, the town has pursued funding for flood retention basins and currently monitors local waterways for impediments that could lead to flooding.

Severe Snowstorms / Ice Storms

Winter storms can be especially challenging for emergency management personnel. The Town's current mitigation strategy is to restrict the location and height of telecommunications facilities, and requiring new subdivisions to have buried utility lines. To the extent that some of the damages from a winter storm can be caused by flooding, flood protection mitigation measures also assist with severe snowstorms and ice storms. The town has pursued funding to install a back-up generator and heating system in the Wales Senior Center that will serve as a shelter destination for vulnerable populations and general residents.

Hurricanes

Hurricanes provide the most lead warning time of all identified hazards, because of the relative ease in predicting the storm's track and potential landfall. MEMA assumes "standby status" when a hurricane's location is 35 degrees North Latitude (Cape Hatteras) and "alert status" when the storm reaches 40 degrees North Latitude (Long Island). Even with significant warning, hurricanes can cause significant damage – both due to flooding and severe wind.

The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Flood protection measures can thus also be considered hurricane mitigation measures. The high winds that often accompany hurricanes can also damage buildings and infrastructure, similar to tornadoes and other strong wind events. Meeting the requirements of the State Building code helps reduce these damages, as does the Town's requirement that new subdivisions have buried utility lines.

Severe Thunderstorms / Winds / Tornadoes

Most damage from tornadoes and severe thunderstorms come from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail. Adherence to the Massachusetts Building Code is a primary current mitigation strategy. In addition, current land development regulations, such as restrictions on the height of telecommunications towers, help prevent wind damages. Requiring special authorization for mobile homes and requiring all new subdivisions to have buried power lines are also mitigation strategies.

Wildfires / Brushfires

The current mitigation strategy is to require residents to notify the Fire Department when they plan to have a controlled burn on their property. Additionally, the town currently clears municipally-owned land of natural debris annually to reduce the likelihood of fire.

Earthquakes

Although there are five mapped seismological faults in Massachusetts, there is no discernible pattern of previous earthquakes along these faults nor is there a reliable way to predict future earthquakes along these faults or in any other areas of the state. Consequently, earthquakes are arguably the most difficult natural hazard for which to plan. Most buildings and structures in the state were constructed without specific earthquake resistant design features. However, the Building Code helps maintain the structural integrity of structures and helps to mitigate earthquakes.

Dam Failure

Dam failure is a highly infrequent occurrence, but a severe incident could prove catastrophic. In addition, dam failure most often coincides with flooding, so its impacts can be multiplied, as the additional water has nowhere to flow. The only mitigation measure currently in place are the regular inspections required by the Massachusetts DCR, as well as a beaver management strategy, which ensures that the intended rate and volume of water is unimpeded.

Drought

Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. The primary mitigation strategy currently in place is to require subdivisions to provide an environmental review that assesses the impact that the development will have on groundwater.

Existing Strategies

The Hazard Mitigation Committee has identified the following mitigation strategies that were in place prior to the development of this Hazard Mitigation Plan. Several of the recommended mitigation measures have multiple benefits because, if implemented, they will mitigate or prevent damages from more than one type of natural hazard. These do not fall under one hazard type, but could be put into place for facilitation of better hazard protection generally.

Strategy	Action Type	Description	Hazards Mitigated	Effectiveness
Flood Plain District	Zoning Bylaws	Overlay district protect areas delineated as part of the 100-year floodplain by regulating uses and special permit requirements (Zoning Bylaw Section III).	Floods	Effective
Buildable lots cannot be located near watercourses	Zoning Bylaws	No parcel is considered a buildable lot unless its upland acreage is at least 90% contiguous of the maximum lot size and shall be land other than any body of water, including watercourses, or any bog, swamp, wet meadow, or marsh as defined in M.G.L. Chapter 131 Section 40.	Floods	Effective
Duplex / multi-family dwellings must minimize use of wetlands	Zoning Bylaws	The development shall be integrated into the existing terrain and surrounding landscape, and shall be designed to protect abutting properties and community amenities. Building sites shall, to the extent possible: (a) minimize use of wetlands, steep slopes, floodplains, and hilltops (Zoning Bylaw 7.5.1.4.a.(1)).	Floods	Effective
Duplex / multi-family dwellings must not increase stormwater runoff	Zoning Bylaws	Drainage shall be designed so that run-off shall not be increased, groundwater recharge is maximized, and neighboring properties will not be adversely affected (Zoning Bylaw 7.5.1.4.a.(1)).	Floods	Effective
Duplex / multi-family dwellings must have underground utilities	Zoning Bylaws	Electric, telephone, cable TV, and other such utilities shall be underground where physically and environmentally feasible.	Severe thunderstorms / wind / tornadoes / hurricanes / severe snow storms / ice storms	Effective

Strategy	Action Type	Description	Hazards Mitigated	Effectiveness
Special Permit	Zoning Bylaw	Some uses require special permit approval, and must meet environmental standards, such as not creating increased flood hazards, water pollution, erosion, or sedimentation (Zoning Bylaw, 3.04.4 Uses by Special Permit).	Floods	Effective
Regulation for telecommunications facilities	Zoning Bylaw	Regulates placement, construction, and appearance of telecommunications facilities. Tower height cannot exceed 100 feet (Zoning Bylaw 7.7).	Severe thunderstorms / wind / tornadoes / hurricanes / severe snow storms / ice storms	Effective
Restrictions on earth removal	Zoning Bylaw	Moving soil, sand, or gravel can occur only under special conditions, including planning board approval of subdivision plan (Zoning Bylaw, 7.2. Earth Removal).	Floods	Effective
Restrictions on locations of mobile homes	Zoning Bylaw	No mobile home, manufactured home, trailer, or camper trailer shall hereafter be placed erected, stored, or installed in the Town of Wales, except storage of a camper trailer (Zoning Bylaw, 7.6 Mobile Homes and Manufactured Homes).	Severe thunderstorms / wind / tornadoes / hurricanes /	Effective
Special permit	Zoning Bylaw	Some uses require special permit approval, and must meet environmental standards, such as not creating increased flood hazards, water pollution, erosion, or sedimentation (Zoning Bylaw, 3.0.4.7 Special Permit Criteria and Decision).	Floods	Effective
All subdivisions must comply with requirements of Wetlands Protection Act	Subdivision Regulations	Requires all new development to conform to regulations set forth in MassDEP Wetlands Protection Act (Subdivision Regulations, 5.5.1. Wetlands Protection).	Floods	Effective
All designs for subdivisions must protect existing natural features	Subdivision Regulations	All natural features, such as large trees, watercourses, wetlands, scenic points, historic spots, and similar community assets which will add attractiveness and value to the property shall be preserved (Subdivision Regulations, 6.1.3. Protection of Natural Features).	Floods	Effective
Storm and surface drainage specifications for subdivisions	Subdivision Regulations	Subdivisions must include specific designs for storm and surface drainage, including sizing all detention facilities to the 100-year storm (Subdivision Regulations, 6.2.4. Storm and Surface Drainage).	Floods	Effective

Strategy	Action Type	Description	Hazards Mitigated	Effectiveness
Natural watercourses cannot be altered or obstructed by subdivisions	Subdivision Regulations	An adequate system of stormwater drainage shall be provided, and no natural watercourse shall be altered or obstructed in such a way as to reduce the natural run-off capacity, unless substitute means of run-off are provided. The Board may require culverts and other stormwater drainage installations where it deems necessary to connect with one or more natural watercourses. All necessary easements for drainage shall be provided, whether on or off the site. (Subdivision Regulations, 6.3. Storm Water Drainage)	Floods	Effective
Responsibility for drainage improvements falls on developers for subdivision projects	Subdivision Regulations	The responsibility for adequate drainage shall rest with the developer. This shall include the risk involved in connecting with existing drainage facilities (if any) provided by the Town. (Subdivision Regulations, 7.3.0 Responsibility)	Floods	Effective
Water supply requirements	Subdivision Regulations	Board of Health Regulations and Department of Environmental Protection Standards for private and public water supplies shall be met or exceeded (Subdivision Regulations, 6.4 Water Supply).	Drought	Effective
Utilities required to be buried in subdivisions	Subdivision Regulations	All lines or wires used for the transmission of electricity or intelligence shall be placed underground within the subdivision in a location approved by the Superintendent of Streets (Subdivision Regulations, 7.5. Utilities Other than Drainage Structures).	Severe thunderstorms / wind / tornadoes / hurricanes / severe snow storms / ice storms	Effective
Environmental impact assessment required as part of subdivisions	Subdivision Regulations	Environmental impact of all new developments must be considered as part of subdivision applications, including the impact to groundwater (Subdivision Regulations 8.5. Environmental Impact).	Drought Wildfire / brushfire	Effective
Conformance with State Building Code	State Regulation	Adoption of the Massachusetts State Building Code, which promotes construction of buildings that can withstand hazards to a certain degree.	All hazards	Effective

Strategy	Action Type	Description	Hazards Mitigated	Effectiveness
Wetlands Protection Regulations	State Regulation	Requires all new development to conform to regulations set forth in MassDEP Wetlands Protection Act.	Floods	Effective
Dam inspections	State Regulation	DCR requires property owners to inspect dams based on the hazard rating of the dam (low, medium, high hazard).	Dam failure	Effective
Burn permits	Municipal Operations	Residents must obtain burn permits from town and Fire Department is notified of days on which burns will occur.	Wildfire / brushfire	Effective
Fire prevention education	Education and outreach	Elementary school students taught fire prevention and safety techniques.	Wildfire / brushfire	Effective
Conformance with National Flood Insurance Program	Federal regulation	Allows property owners to purchase flood insurance from the government against future losses. Longmeadow participates in the program. Continued compliance with NFIP program by maintaining Floodplain Overlay District and limiting development in 100-year floodplain.	Floods	Effective
Tree trimming	Municipal Operations	Town Tree Warden works with National Grid to identify trees that need to be trimmed to minimize falling tree branches interfering with power lines. The assessment and trimming is currently conducted on a 2-year cycle, which is insufficient.	Severe thunderstorms / wind / tornadoes / hurricanes / severe snow storms / ice storms	Effective but needs to be completed more frequently.
Regular assessment of culverts and bridges for damage from flooding	Municipal Operations	The Town regularly assesses the condition of its transportation and stormwater infrastructure. There are 92 cross drains in Town, 75 of which have been determined to be in need of replacement. The Holland Road bridge has also been identified as needing significant repairs.	Floods	Effective

Strategy	Action Type	Description	Hazards Mitigated	Effectiveness
Drainage improvements to Union Road	Municipal Operations	Drainage improvements to Union Road are currently in process to resolve chronic flooding issues. The cost of these improvements will be approximately \$90,000.	Floods	Effective
Woodland Heights drainage improvements	Municipal Operations	The Town has secured Community Development Block Grant funding for drainage improvements in the Woodland Heights area. The cost of these improvements will be approximately \$600,000.	Floods	Effective
Reverse 911 system	Municipal Operations	Reverse 911 system, known as Code Red, is currently linked to New Braintree, MA emergency dispatch.	All hazards	Effective
Beaver management strategy	Municipal operations	Town DPW monitors waterways and culverts for impediments from beavers and hires private company to remove beaver dams. Beaver traps are also installed at areas known for beaver activity.	Floods	Effective
Wildfire Prevention	Municipal Operations	State and local conservation land cleaned annually to eliminate fuel source for potential wildfire	Wildfire / brushfire	Effective

Existing Resources

In addition to the existing mitigation strategies listed above, the Town currently has the following resources available for hazard mitigation, in the form of administrative and funding capabilities:

- The Town has a Capital Improvement Plan, which provides the overall budget for capital expenditures of general Town funds. The CIP is reviewed annually by the Town. The review involves evaluating proposals for the construction of municipal buildings, including schools, and the acquisition of land or personal property. The review also includes feedback from the Town's Fire Chief, Police Chief, Emergency Management Director, and DPW Director to assess what, if any, capital improvements should be conducted to reduce the Town's vulnerability from hazards.
- The Town receives Massachusetts Chapter 90 funding, which provides financing to implement drainage improvements for any identified drainage issues on roads. The funds are provided by the State Transportation Bond authorizes funding for capital improvement projects such as highway construction, and preservation and improvement projects that extend the life of existing capital facilities.
- Staff from the Town's various departments - including Fire, Police, DPW, Board of Health, Planning, etc. - regularly collaborate and share information. For example, the Police Department alerts the Department of Public Works to any issues with flooding or road conditions they find during regular patrolling. The current staffing is considered adequate to enforce regulations and staff is trained on hazards and mitigation.
- The Town requires new construction to meet State Building Code and requires an inspection from the Town Building Inspector.
- Properties that are financed through Federally backed loans and located within the FIRM-designated Special Flood Hazard Area (100-year floodplain) are required to purchase flood insurance. The Town enforces this requirement through the Building Inspector.
- The Town's Firemen and Police are available for conducting outreach and education on fire prevention and safety to local schools, to reduce the risk of fire in Town.
- The Town uses taxes collected from residents to fund Town staff involved in mitigation strategies, including fire and police. Funding is also used to make improvements to road infrastructure.
- The Town's Planning Board reviews all new development or changes to existing development, as per the Town's zoning bylaw. This ensures that new development conforms to the mitigation strategies included in the zoning bylaw, as listed above.
- The Town's Hazard Mitigation Committee will convene regular meetings to update this plan, as per the schedule indicated in Section 6 of this plan.

Potential Improvements to Existing Strategies and Resources

The existing mitigation capabilities and existing resources listed above were determined by the Hazard Mitigation Committee to be effective for mitigating hazards, with very few changes to existing mitigation strategies determined to be necessary. The only exception to this is the regular trimming of trees, which the Hazard Mitigation Committee determined could occur more frequently.

New Strategies

Based on the hazard identification and risk assessment, list of critical facilities that would be affected by hazards, and evaluation of the effectiveness of current mitigation strategies, the Hazard Mitigation Committee identified several new strategies to pursue.

Strategy Prioritization Methodology

The Hazard Mitigation Planning Committee reviewed and prioritized a list of new mitigation strategies using the following criteria:

Application to multiple hazards – Strategies are given a higher priority if they assist in the mitigation of several natural hazards.

Time required for completion – Projects that are faster to implement, either due to the nature of the permitting process or other regulatory procedures, or because of the time it takes to secure funding, are given higher priority.

Estimated benefit – Strategies which would provide the highest degree of reduction in loss of property and life are given a higher priority. This estimate is based on the Hazard Identification and Analysis Chapter, particularly with regard to how much of each hazard's impact would be mitigated.

Cost effectiveness – in order to maximize the effect of mitigation efforts using limited funds, priority is given to low-cost strategies. For example, regular tree maintenance is a relatively low-cost operational strategy that can significantly reduce the length of time of power outages during a winter storm. Strategies that have identified potential funding streams, such as the Hazard Mitigation Grant Program, are also given higher priority.

The following categories are used to define the priority of each mitigation strategy:

- **Low** – Strategies that would not have a significant benefit to property or people, address only one or two hazards, or would require funding and time resources that are impractical
- **Medium** – Strategies that would have some benefit to people and property and are somewhat cost effective at reducing damage to property and people

- **High** – Strategies that provide mitigation of several hazards and have a large benefit that warrants their cost and time to complete
- **Very High** – extremely beneficial projects that will greatly contribute to mitigation of multiple hazards and the protection of people and property. These projects are also given a numeric ranking within the category.

Cost Estimates

Each of the following implementation strategies is provided with a cost estimate. Projects that already have secured funding are noted as such. Where precise financial estimates are not currently available, categories were used with the following assigned dollar ranges:

- **Low** – cost less than \$50,000
- **Medium** – cost between \$50,000 – \$100,000
- **High** – cost over \$100,000

Cost estimates take into account the following resources:

- Town staff time for grant application and administration (at a rate of \$25 per hour)
- Consultant design and construction cost (based on estimates for projects obtained from town and general knowledge of previous work in town)
- Town staff time for construction, maintenance, and operation activities (at a rate of \$25 per hour)

Project Timeline

Each strategy is provided with an estimated length of time it will take for implementation. Where funding has been secured for the project, a specific future date is provided for when completion will occur. However, some projects do not currently have funding and thus it is difficult to know exactly when they will be completed. For these projects, an estimate is provided for the amount of time it will take to complete the project once funding becomes available.

Prioritized List of Mitigation Strategies for Wales

Action Name	Action Type	Description	Hazards Mitigated	Agency	Priority	Cost	Funding Source	Timeframe
Install Emergency Generators	Structure and Infrastructure Projects	Secure funding and install emergency generator at Wales Senior Center.	All Hazards	Selectboard, DPW, Council on Aging	High	Medium	HMPG	5 years
Install Detention Basins	Structure and Infrastructure Projects	Install new detention basins t locations that flood. Grant application submitted to fund installation.	Flooding	Selectboard, DPW	High	High	HMPG	2 years
Replace Under-Performing Culverts	Structure and Infrastructure Projects	Address approximately 30 underperforming culverts that are scheduled to be repaired or replaced.	Flooding	DPW, Fire Department, Police Department	High	Medium	DPW / MassWorks / HMPG	4 years
Monson Road improvements	Structure and Infrastructure Projects	Implement funding for Monson Road drainage and paving improvements.	Flooding	DPW	High	Medium	HMPG	2 years
Extreme Cold Weather Education	Education and Outreach	Educate property owners in how to protect plumbing, including letting the faucet drip during extreme cold weather. Materials will be included at Senior Center and published in Town newsletter.	Severe snow storms / ice storms	Fire Department, Police Department, DPW, Council on Aging	Medium	Low	DPW, Council on Aging	2 years
Tree pruning	Municipal operations	Inspect and prune trees annually, to reduce risk of fallen branches felling power lines, as a collaboration between Tree Warden and National Grid.	Severe thunderstorms / wind / tornadoes / hurricanes / severe snow storms / ice storms	Tree Warden, DPW, Fire Department	Medium	Low	Town	2 years

Prioritized List of Mitigation Strategies for Wales

Action Name	Action Type	Description	Hazards Mitigated	Agency	Priority	Cost	Funding Source	Timeframe
Flood Risk Education	Education and Outreach	Appoint emergency services member to conduct outreach to homeowners to educate them about flood risks and encourage purchasing of flood insurance. Materials will be included at Senior Center and published in Town newsletter.	Flooding	Fire Department, Police Department, DPW, Council on Aging	Medium	Low	Police / Fire Department	2 years
Monitor at-risk culverts	Municipal operations	Annually inspect at-risk culverts that could be impacted during flooding.	Flooding	DPW, Fire Department, Police Department, Planning Board, Selectboard	Medium	Low	DPW	1 year
Outreach to vulnerable populations about shelter	Education and Outreach	Conduct outreach to senior citizens and other vulnerable populations about Senior Center being an accessible emergency shelter with heating.	All hazards	Council on Aging	Medium	Low	Council on Aging	2 years
CEM Plan Update	Local planning and regulation	Update CEM Plan as per the State of Massachusetts requirement that plan is revised every 5 years.	All hazards	Select Board, DPW, Fire Department, Police Department	Medium	Low	Town	2 years

6: PLAN REVIEW, EVALUATION, IMPLEMENTATION, AND ADOPTION

Upon completion of the draft Hazard Mitigation Plan, a public meeting was held by the Town staff and the Pioneer Valley Planning Commission on January 12th, 2015 to present and request comments from town officials and residents. The Hazard Mitigation Plan was then submitted to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency for their review. Upon receiving conditional approval of the plan by FEMA, the plan was presented to the Town's Select Board and adopted.

Plan Implementation

The implementation of this plan began upon its formal adoption by the Town Select Board and approval by MEMA and FEMA. Those Town departments and boards responsible for ensuring the development of policies, bylaw revisions, and programs as described in this plan will be notified of their responsibilities immediately following approval. The Town's Hazard Mitigation Committee will oversee the implementation of the plan.

Incorporation with Other Planning Documents

Existing plans, studies, reports and municipal documents were incorporated throughout the planning process. This included a review and incorporation of significant information from the following key documents:

- ***Wales Comprehensive Emergency Management Plan*** (particularly the Critical Infrastructure Section) – the Critical Infrastructure section was used to identify those infrastructure components in Wales that have been identified as crucial to the function of the Town.
- ***Wales Zoning Bylaw and Subdivision Regulations*** - The Town's Zoning was used to gather identify those actions that the Town is already taking that are reducing the potential impacts of a natural hazard (i.e. floodplain regulations) to avoid duplicating existing successful efforts.
- ***Massachusetts State Hazard Mitigation Plan*** - This plan was used to insure that the Town's Hazard Mitigation Plan is consistent with the State's Plan.

The Hazard Mitigation Plan will also be incorporated into updates of the Town's Comprehensive Emergency Management Plan.

During regular update meetings for the Hazard Mitigation Plan, the Hazard Mitigation Committee will review whether any of these plans are in the process of being updated. If so, the Hazard Mitigation Committee will provide copies of the Hazard Mitigation Plan to relevant Town staff and brief them on the content of the Hazard Mitigation Plan. The Hazard Mitigation

Committee will also review current Town programs and policies to ensure that they are consistent with the mitigation strategies described in this plan.

Plan Monitoring and Evaluation

The Town's Emergency Management Director will call meetings of all responsible parties to review plan progress as needed, based on occurrence of hazard events. The public will be notified of these meetings in advance through a posting of the agenda at Town Hall. Responsible parties identified for specific mitigation actions will be asked to submit their reports in advance of the meeting. Meetings will entail the following actions:

- Review of previous hazard events to discuss and evaluate major issues, effectiveness of current mitigation, and possible mitigation for future events.
- Assess how the mitigation strategies of the plan can be integrated with other Town plans and operational procedures, including the Zoning Bylaw and Emergency Management Plan.
- Review and evaluate progress toward implementation of the current mitigation plan based on reports from responsible parties.
- Amend current plan to improve mitigation practices.

Meetings will involve evaluation and assessment of the plan, regarding its effectiveness at achieving the plan's goals and stated purpose. The following questions will serve as the criteria that is used to evaluate the plan:

Plan Mission and Goal

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the goal and mission?

Hazard Identification and Risk Assessment

- Have there been any new occurrences of hazard events since the plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.
- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall assessment of risk and vulnerability should be edited to reflect these changes.

- Is there any new data available from local, state, or Federal sources about the impact of previous hazard events, or any new data for the probability of future occurrences? If so, this information should be incorporated into the plan.

Existing Mitigation Strategies

- Are the current strategies effectively mitigating the effect of any recent hazard events?
- Has there been any damage to property since the plan was last reviewed?
- How could the existing mitigation strategies be improved upon to reduce the impact from recent occurrences of hazards? If there are improvements, these should be incorporated into the plan.

Proposed Mitigation Strategies

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any recently completed mitigation strategies affected the Town's vulnerability and impact from hazards that have occurred since the strategy was completed?
- Should the criteria for prioritizing the proposed mitigation strategies be altered in any way?
- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources, or recent hazard events?

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective? Could it be improved?
- Are there any Town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them?
- How can the current Hazard Mitigation Plan be better integrated with other Town planning tools and operational procedures, including the zoning bylaw, the Comprehensive Emergency Management Plan, and the Capital Improvement Plan?

Following these discussions, it is anticipated that the committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments

and/or revise the goals and objectives contained in the plan. The committee will review and update the Hazard Mitigation Plan every five years.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process. The Hazard Mitigation Committee will hold all meetings in accordance with Massachusetts open meeting laws and the public invited to attend. The public will be notified of any changes to the Plan via the meeting notices board at Town Hall, and copies of the revised Plan will be made available to the public at Town Hall.

7: APPENDICES

Appendix A – Technical Resources

1) Agencies

Massachusetts Emergency Management Agency (MEMA).....	508/820-2000
Hazard Mitigation Section	617/626-1356
Federal Emergency Management Agency (FEMA)	617/223-4175
MA Regional Planning Commissions:	
Berkshire Regional Planning Commission (BRPC).....	413/442-1521
Cape Cod Commission (CCC).....	508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC).....	508/693-3453
Franklin Regional Council of Governments (FRCOG).....	413/774-3167
Martha’s Vineyard Commission (MVC).....	508/693-3453
Merrimack Valley Planning Commission (MVPC).....	978/374-0519
Metropolitan Area Planning Council (MAPC).....	617/451-2770
Montachusett Regional Planning Commission (MRPC).....	978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC).....	508/228-7236
Northern Middlesex Council of Governments (NMCOG).....	978/454-8021
Old Colony Planning Council (OCPC).....	508/583-1833
Pioneer Valley Planning Commission (PVPC).....	413/781-6045
Southeastern Regional Planning and Economic Development District (SRPED).....	508/823-1803
MA Board of Building Regulations & Standards (BBRS).....	617/227-1754
MA Coastal Zone Management (CZM).....	617/626-1200
DCR Water Supply Protection.....	617/626-1379
DCR Waterways.....	617/626-1371
DCR Office of Dam Safety.....	508/792-7716
DFW Riverways.....	617/626-1540
MA Dept. of Housing & Community Development.....	617/573-1100
Woods Hole Oceanographic Institute.....	508/457-2180
UMass-Amherst Cooperative Extension.....	413/545-4800
National Fire Protection Association (NFPA).....	617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX – an association of private companies & industries involved in disaster recovery planning).....	781/485-0279
MA Board of Library Commissioners.....	617/725-1860
MA Highway Dept, District 2.....	413/582-0599
MA Division of Marine Fisheries.....	617/626-1520
MA Division of Capital & Asset Management (DCAM).....	617/727-4050
University of Massachusetts/Amherst.....	413/545-0111
Natural Resources Conservation Services (NRCS).....	413/253-4350
MA Historical Commission.....	617/727-8470
U.S. Army Corps of Engineers.....	978/318-8502
Northeast States Emergency Consortium, Inc. (NESEC).....	781/224-9876
National Oceanic and Atmospheric Administration: National Weather Service.....	508/824-5116
US Department of the Interior: US Fish and Wildlife Service	413/253-8200
US Geological Survey.....	508/490-5000

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP)	MA Emergency Management Agency
406 Public Assistance and Hazard Mitigation	MA Emergency Management Agency
Community Development Block Grant (CDBG).....	DHCD, also refer to RPC
Dam Safety Program.....	MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG)	MA Emergency Management Agency
Emergency Generators Program by NESEC†	MA Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation
Service Flood Mitigation Assistance Program (FMAP).....	MA Emergency Management Agency
Flood Plain Management Services (FPMS).....	US Army Corps of Engineers
Mitigation Assistance Planning (MAP).....	MA Emergency Management Agency
Mutual Aid for Public Works.....	Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) †	MA Emergency Management Agency
Power of Prevention Grant by NESEC†	MA Emergency Management Agency
Roadway Repair & Maintenance Program(s).....	Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection	US Army Corps of Engineers
Section 103 Beach Erosion.....	US Army Corps of Engineers
Section 205 Flood Damage Reduction.....	US Army Corps of Engineers
Section 208 Snagging and Clearing	US Army Corps of Engineers
Shoreline Protection Program.....	MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....	MA Department of Environmental Protection
Wetlands Programs	MA Department of Environmental Protection

†NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NESEC for more information.

† Note regarding National Flood Insurance Program (NFIP) and Community Rating System (CRS): The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community's floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. MEMA can provide additional information regarding participation in the NFIP-CRS Program.

3) Internet Resources

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/hazards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/disaster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/geog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.html	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links

Sponsor	Internet Address	Summary of Contents
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iaaa.iix.com/ndcmap.html	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Appendix B – Documentation of the Planning Process

Wales Hazard Mitigation Committee Meeting Agenda

**Wales Town Hall
September 9, 2014, 5:30 p.m.**

1. Introductions
2. Overview of Hazard Mitigation Planning Process
 - a. Background on Hazard Mitigation Planning
 - b. Planning process and requirements
 - i. 4 committee meetings
 - ii. 2 public committee meetings
 - iii. MEMA / FEMA review
 - iv. Select Board adoption
 - c. Timeline for meetings
 - Committee Meeting #1
September 9th
 - Committee Meeting #2 / Public Outreach Meeting #1
Proposed: Week of October 6th
 - Committee Meeting #3
Proposed: Week of October 20th
 - Committee Meeting #4 / Public Outreach Meeting #2
Proposed: Week of November 3rd
3. Review of Chapter 1: Planning Process
4. Review of Chapter 2: Local Profile
5. Review of Chapter 3: Hazard Identification and Risk Assessment

**Wales Hazard Mitigation Committee Meeting
Sign-In Sheet
September 9, 5:30 p.m., Wales Town Hall**

Name	Position	E-mail
John Cooke	EMD / Deputy Fire Chief	Deputy.Chief@townofwales.net
Bruce R. Cadieu	EMA / Road Commissioner	road.com@townofwales.net

**Wales Natural Hazard Mitigation Plan
Public Input and Workshop**

Agenda

**Wales Senior Center
October 6, 2014, 9:00 a.m.**

1. Welcome and introductions
2. Overview of hazard mitigation planning process
3. Hazard identification and risk assessment
 - a. Types of hazards affecting Wales
 - b. Previous occurrences, extent, location, impact, future probability, and vulnerability of each hazard
4. Existing mitigation measures
5. Recommended new mitigation strategies or changes to existing mitigation strategies
6. Discussion
7. Next steps

(No members of the public attended)

**Wales Hazard Mitigation Committee
Meeting Agenda**

**Wales Senior Center
October 6, 2014, 9:30 a.m.**

1. Review of changes from previous Hazard Mitigation Committee meeting
2. Existing mitigation strategies undertaken by Town and assessment of effectiveness
3. Assessment of proposed mitigation strategies and potential prioritization

Wales Hazard Mitigation Committee Meeting
Sign-In Sheet
October 6, 9:30 a.m., Wales Senior Center

Name	Position	E-mail
Heather Ackerman	Director/ Senior Center	coae@townofwales.net
John Cechie	EMD/Deputy Fire Chief	deputy.chief@townofwales.net
ALEXANDER TRAW	Planner, PUPC	Attrain@pupc.org
Bruce Cadieux	road commissioner	road-com@townofwales.net



MEDIA RELEASE

CONTACT: Josiah Neiderbach, PVPC Planner, (413) 781-6045 or jneiderbach@pvpc.org
Bruce Cadieux, Road Commissioner, Town of Wales (413) 245-7494 or road-com@townofwales.net

FOR IMMEDIATE RELEASE
October 1, 2014

Town of Wales Hazard Mitigation Plan Public Engagement Event to Be Held

Wales residents are invited to provide comments on the development of the Town of Wales' first hazard mitigation plan **Monday, October 6** at 9:00 a.m. at the Wales Senior Center, 85 Main Street. All members of the public are welcome to attend.

The meeting will include an introduction to the hazard mitigation planning process, information on the location of the Town's critical facilities, and a summary of existing mitigation initiatives. Municipal officials and Pioneer Valley Planning Commission staff will be available to answer questions and listen to comments from the public.

This planning effort is being undertaken to help the Town of Wales assess the risks faced from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

The plan is being produced by the Town with assistance from the Pioneer Valley Planning Commission and is funded by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA).

For more information, please contact PVPC's Josiah Neiderbach at jneiderbach@pvpc.org or (413) 781-6045.

—30—

Wales Natural Hazard Mitigation Plan

Public Outreach Event

January 12, 2015



FEMA



Agenda

2

- Overview and benefits of hazard mitigation
- Plan development process
- Identified hazards and mitigation strategies
- Questions and discussion



What is Hazard Mitigation?

3



FEMA

“Any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards.”



Examples:

- Limiting development in high-risk areas
- Retrofitting structures to protect them from floods, high winds, etc.
- Minor drainage flood control projects in areas of localized flooding
- Fire safety education

Mitigation and Preparedness

4

Hazard Mitigation

Planning and zoning

Open space preservation

Education and outreach

Drainage improvements

Emergency Preparedness

Evacuation plans and emergency shelters

Radio communications equipment

Emergency response drills

Benefits of Hazard Mitigation

5

- ❑ Makes community eligible to apply for MEMA/FEMA grant opportunities for hazard mitigation projects
- ❑ Mitigation is less expensive than disaster clean up
- ❑ Having a plan provides an approach for using limited resources more effectively

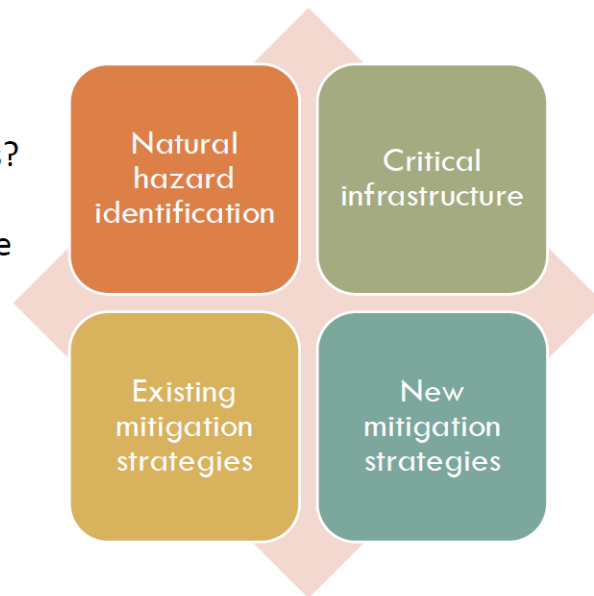


Components of a Hazard Mitigation Plan

6

Questions considered:

- What are the hazards in Wales?
- How is Wales affected by these hazards?
- How effective are current mitigation strategies?
- What new strategies could be implemented?



Overview of Planning Process

7

- Three Hazard Mitigation Committee meetings:
September 9th, October 6th, and January 12th
- Hazard Mitigation Committee members:
 - ▣ John Croke, EMD and Deputy Fire Chief
 - ▣ Bruce Cadieux, Road Commissioner
 - ▣ Jeffrey Hastings, Police Chief
 - ▣ Heather Ackerman, Senior Center Director

Overview of Planning Process (continued)

8

- Two public outreach meetings:
October 6th, 2014 and January 12th, 2015
- After this meeting, the plan will be revised with comments incorporated and submitted to MEMA and FEMA for comment
- Select Board will then review and adopt

Hazard Assessment Summary

9

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Hazard Risk Index Rating
Flooding	Small	Moderate	Limited	2 - High risk
Severe Snowstorms / Ice Storms	Large	High	Limited	2 - High risk
Wildfire / Brushfire	Large	Low	Critical	2 – High risk
Severe Thunderstorms / Winds / Tornadoes	Small	Severe thunderstorms and wind: Moderate Tornadoes: Low	Limited	Severe thunderstorms and wind: 2 – High risk Tornadoes: 4 – Low risk
Hurricanes	Large	Low	Limited	3 - Medium Risk
Earthquakes	Large	Very low	Critical	4 - Low risk
Dam Failure	Medium	Very low	Critical	4 - Low risk
Drought	Large	Low	Minor	5 - Very low risk

Prioritized Mitigation Strategies

10

See handout.

Question and Comments

11

Contact information:

Josiah Neiderbach

Planner, Pioneer Valley Planning Commission

E-mail: jneiderbach@pvpc.org

Phone: 413-781-6045

Draft Plan on PVPC Website (www.pvpc.org)

The screenshot shows a web browser window with two tabs: 'PVPC | PIONEER VALLEY P...' and 'Town of Wales Hazard Mit...'. The address bar shows 'www.pvpc.org/content/town-wales-hazard-mitigation-plan'. The website header features the PVPC logo with the tagline 'Catalyst for Regional Progress', the text 'PIONEER VALLEY PLANNING COMMISSION', and navigation links for 'ABOUT', 'PLANNING', 'DOING', and 'MEASURING'. There are also links for 'TRANSLATE PAGE', 'CHANGE FONT SIZE', and social media icons for Twitter, YouTube, and Facebook. Below the header, a breadcrumb trail reads 'Home > Tags > Hazard Mitigation Plan'. The main heading is 'Town of Wales Hazard Mitigation Plan'. Below this, there are 'View' and 'Edit' buttons. A section titled 'Add document' contains the Federal Emergency Management Agency (FEMA) logo and a paragraph: 'This draft of the Town of Wales Hazard Mitigation Plan was completed to help the Town of Wales assess the risks faced from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts.' Below this, a section titled 'Documents:' lists a document titled 'WALES HAZARD MITIGATION PLAN' with the subtitle 'Mitigation Plan for the Town of Wales' and the filename 'Wales_HMP_2014_11-6-14.docx'. A section titled 'Associated Communities:' lists 'Wales'. A section titled 'Tags:' lists 'Hazard Mitigation Plan'.

PVPC | PIONEER VALLEY P x Town of Wales Hazard Mit x

www.pvpc.org/content/town-wales-hazard-mitigation-plan

PVPC Catalyst for Regional Progress PIONEER VALLEY PLANNING COMMISSION

TRANSLATE PAGE CHANGE FONT SIZE

ABOUT PLANNING DOING MEASURING

Home > Tags > Hazard Mitigation Plan

Town of Wales Hazard Mitigation Plan

View Edit

Add document



This draft of the Town of Wales Hazard Mitigation Plan was completed to help the Town of Wales assess the risks faced from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts.

Documents:

 **WALES HAZARD MITIGATION PLAN**
Mitigation Plan for the Town of Wales
Wales_HMP_2014_11-6-14.docx

Associated Communities:

Wales

Tags:

- Hazard Mitigation Plan

**Wales Hazard Mitigation Committee
Meeting Agenda**

**Wales Senior Center
January 12, 2015, 11:30 a.m.**

1. Review of prioritized list of mitigation strategies
2. Procedures for regular maintenance of plan
3. Plan adoption process
4. Next steps

Wales Hazard Mitigation Committee Meeting
Sign-In Sheet
January 12, 2015, 11:30 a.m., Wales Senior Center

Name	Position	E-mail
Bruce Cadieux	Assistant Emergency Manager Road Commissioner	road-conf@townofwales.net
Thea Khera	COA Director Senior Center	

**Wales Hazard Mitigation Plan
Public Input and Workshop**

Agenda

**Wales Senior Center
January 12, 2015, 11:00 a.m.**

1. Welcome and introductions
2. Overview of hazard mitigation planning process
3. Hazard identification and risk assessment
 - a. Types of hazards affecting Montgomery
 - b. Previous occurrences, extent, location, impact, future probability, and vulnerability of each hazard
4. Existing mitigation measures
5. Recommended new mitigation strategies or changes to existing mitigation strategies
6. Discussion
7. Next steps

(No members of the public attended)



Catalyst for Regional Progress

PVPC

Timothy W. Brennan, Executive Director

MEDIA RELEASE

CONTACT: Josiah Neiderbach, PVPC Planner, (413) 781-6045 or
jneiderbach@pvpc.org
Bruce Cadieux, Road Commissioner, Town of Wales (413) 245-7494 or
road-com@townofwales.net

FOR IMMEDIATE RELEASE

January 8, 2015

Town of Wales to Hold Public Engagement Event for Hazard Mitigation Plan

Wales residents are invited to provide comments on a completed draft of the Town's first hazard mitigation plan on Monday, January 12th, from 11:00 a.m. to 11:30 a.m. at the Wales Senior Center, 85 Main Street. The plan was produced by the Town with assistance from the Pioneer Valley Planning Commission and is funded by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA). All members of the public are welcome to attend the event.

The meeting will include an introduction to the planning process, a summary of existing mitigation initiatives, and an outline of recommended strategies for addressing natural hazards in Wales. Municipal officials and PVPC staff will be available to answer questions and listen to comments on the draft plan, which is posted at <http://www.pvpc.org/content/town-wales-hazard-mitigation-plan>. A paper copy of the plan will also be available at Wales Town Hall.

This planning effort is being undertaken to help the Town of Wales assess the risks faced from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

For more information, please contact PVPC's Josiah Neiderbach at jneiderbach@pvpc.org or (413) 781-6045.

Media Organizations Sent Press Releases

Media Organization	Address	Town	State	Zip Code
African American Point of View	688 Boston Road	Springfield	MA	01119
Agawam Advertiser News	23 Southwick Street	Feeding Hills	MA	01030
Amherst Bulletin	115 Conz Street	Northampton	MA	01060
Belchertown Sentinel	1 Main Street	Belchertown	MA	01007
Berkshire Eagle	75 South Church Street	Pittsfield	MA	01202
Brattleboro Reformer	62 Black Mountain Rd.	Brattleboro	VT	05301
CBS 3 Springfield	One Monarch Place	Springfield	MA	01144
Chicopee Register	380 Union Street	West Springfield	MA	01089
CommonWealth Magazine	18 Tremont Street	Boston	MA	02108
Country Journal	5 Main Street	Huntington	MA	01050
Daily Hampshire Gazette	115 Conz Street	Northampton	MA	01060
El Sol Latino	P.O. Box 572	Amherst	MA	01004
Going Green	PO Box 1367	Greenfield	MA	01302
Hilltown Families	P.O. Box 98	West Chesterfield	MA	01084
Holyoke Sun	138 College Street	South Hadley	MA	01075
Journal Register	24 Water Street	Palmer	MA	01069
La Voz Hispana	133 Maple Street #201	Springfield	MA	01105
Ludlow Register	24 Water Street	Palmer	MA	01069
Massachusetts Municipal Association	One Winthrop Street	Boston	MA	02110
Quaboag Current	80 Main Street	Ware	MA	01082
Recorder	14 Hope Street	Greenfield	MA	01302
Reminder	280 N. Main Street	East Longmeadow	MA	01028
Southwick Suffield News	23 Southwick Street	Feeding Hills	MA	01030
State House News Service	State House	Boston	MA	02133
Tantasqua Town Common	80 Main Street	Ware	MA	01082
The Longmeadow News	62 School Street	Westfield	MA	01085
The Republican	1860 Main Street	Springfield	MA	01102
The Westfield News	62 School Street	Westfield	MA	01085
Town Reminder	138 College Street	South Hadley	MA	01075
Urban Compass	83 Girard Avenue	Hartford	CT	06105
Valley Advocate	115 Conz Street	Northampton	MA	01061
Vocero Hispano	335 Chandler Street	Worcester	MA	01602

WAMC Northeast Public Radio	1215 Wilbraham Road	Springfield	MA	01119
Ware River News	80 Main Street	Ware	MA	01082
West Springfield Record	P.O. Box 357	West Springfield	MA	01098
WFCR-Public Radio	131 County Circle	Amherst	MA	01003
WGBY-Public TV	44 Hampden Street	Springfield	MA	01103
WGGB ABC40/FOX 6 News	1300 Liberty Street	Springfield	MA	01104
WHMP-FM	15 Hampton Avenue	Northampton	MA	01060
Wilbraham-Hampden Times	2341 Boston Road	Wilbraham	MA	01095
Worcester Telegram & Gazette	20 Franklin Street	Worcester	MA	01615
WRNX/WHYN/WPKR Radio	1331 Main Street	Springfield	MA	01103
WWLP-TV 22	PO Box 2210	Springfield	MA	01102

Pioneer Valley Planning Commission Regional Reporter January 2015

Let PVPC Guide Your Community Through the Hazard Mitigation Planning Process!

Over the past 10 years, PVPC has helped 40 communities in the Pioneer Valley develop hazard mitigation plans, making them eligible for grant opportunities from the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA).

Through the hazard mitigation planning process, communities assess their vulnerability to natural hazards, such as flooding, snowstorms, hurricanes, wildfire, and tornadoes. They also prioritize a set of mitigation strategies that will help eliminate the long-term risk to human life and property from these hazards. Common mitigation strategies that are eligible for grant funding from FEMA and MEMA include minor localized flood reduction projects, structural retrofitting of existing buildings, culvert improvements, installation of emergency backup generators, and infrastructure retrofits.

PVPC provides guidance in all aspects of the development of hazard mitigation plans, including identification and mapping of natural hazards, collaboration with municipal officials to prioritize mitigation strategies, and public outreach. PVPC can also assist communities in applying for grants to fund mitigation projects, through its Local Technical Assistance (*LTA*) program. Contact Josiah Neiderbach at jneiderbach@pvpc.org to find out more.

Pioneer Valley Planning Commission Regional Reporter April 2013

The Pioneer Valley Planning Commission is currently working with 23 member municipalities to create new hazard mitigation plans and update expiring plans. These plans, approved by the Federal Emergency Management Agency (FEMA), make these municipalities eligible to apply for hazard mitigation grant funds to address identified top community priorities to mitigate the long-term consequences of natural disasters.

PVPC is currently in the process of creating or updating plans for 10 communities. This includes developing new hazard mitigation plans for Granville, Longmeadow, Montgomery, Russell, and Wales, as well as updating the current plans for Agawam, Easthampton, Hampden, Southwick, and Ware.

PVPC also recently applied for funds from FEMA to create or update plans for an additional 13 communities. This includes creating new plans for Blandford and Tolland, as well as updating existing plans for Chesterfield, Hadley, Hatfield, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southampton, Westhampton, and Wilbraham.

Copies of approved hazard mitigation plans are available on PVPC's website at <http://www.pvpc.org/activities/landuse-mitplans-2011.shtml>. For more information please contact PVPC's Josiah Neiderbach at (413) 781-6045 or jneiderbach@pvpc.org.

**Pioneer Valley Planning Commission Regional Reporter
December 2012**

PVPC working with member communities to mitigate the long term consequences of natural hazards

PVPC is working with 10 member municipalities to update and/or develop new Hazard Mitigation plans. Granville, Longmeadow, Montgomery, Russell, and Wales are all developing their first Hazard Mitigation plans; while Agawam, Easthampton, Hampden, Southwick, and Ware are working on updates.

PVPC was also engaged by the University of Massachusetts Amherst campus to write their campus Hazard Mitigation plan, and PVPC has just submitted a grant application to MEMA to update plans for Hadley, Hatfield, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southampton, Westhampton, and Wilbraham.

Having a FEMA approved Hazard Mitigation plan makes each municipality eligible to apply for Hazard Mitigation grant funds to address identified top community priorities to mitigate the long-term consequences of natural disasters.

For more information, please contact Catherine Ratté at cratte@pvpc.org or 413/781-6045.

Appendix C – List of Acronyms

FEMA	Federal Emergency Management Agency
MEMA	Massachusetts Emergency Management Agency
PVPC	Pioneer Valley Planning Commission
EPA	Environmental Protection Agency
DEP	Massachusetts' Department of Environmental Protection
NWS	National Weather Service
HMGP	Hazard Mitigation Grant Program
FMA	Flood Mitigation Assistance Program
SFHA	Special Flood Hazard Area
CIS	Community Information System
DCR	Massachusetts Department of Conservation and Recreation
FERC	Federal Energy Regulatory Commission
TRI	Toxics Release Inventory
FIRM	Flood Insurance Rate Map
NFIP	National Flood Insurance Program
CRS	Community Rating System
BOS	Board of Selectmen
DPW	Department of Public Works
LEPC	Local Emergency Planning Committee
EMD	Emergency Management Director
Con Com	Conservation Commission
Ag Com	Agricultural Commission
EOC	Emergency Operations Center
CEM Plan	Comprehensive Emergency Management Plan
EMA	Emergency Management Agency
RACES	Radio Amateur Civil Emergency Service
WMECO	Western Massachusetts Electric Company
HAZMAT	Hazardous Materials

Appendix D – Past and Potential Hazards/Critical Facilities Map

CERTIFICATE OF ADOPTION

Town of Wales, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE TOWN OF WALES HAZARD MITIGATION PLAN

WHEREAS, the Town of Wales established a Committee to prepare the Hazard Mitigation plan;
and

WHEREAS, the Town of Wales participated in the development of the Town of Wales Hazard Mitigation Plan;

and WHEREAS, the Town of Wales Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Wales, and

WHEREAS, a duly-noticed public meeting was held by the Board of Selectmen on 8/11 for the public and municipality to review prior to consideration of this resolution; and

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

NOW, THEREFORE BE IT RESOLVED that the Town of Wales Board of Selectmen formally approves and adopts the Town of Wales Hazard Mitigation Plan, in accordance with M.G.L. c. 40.

ADOPTED AND SIGNED this 11th day of August, 2015

ATTEST