



Town of Bernardston



Municipal Vulnerability Preparedness (MVP) Program

MVP Resiliency Plan

June 2021

Facilitated by the
Franklin Regional Council of Governments
A State-Certified MVP Provider



MVP Resiliency Plan

Including the Summary of Findings from the
Community Resilience Building Workshop

October 2020

Contents

Overview:.....	3
Community Resilience Building: Stakeholder Outreach & Workshop	4
Summary of Findings.....	5
Top Recommendations to Improve Resilience	15
Appendices	29
Maps	29
Outreach Packets.....	29
Interview Responses.....	29
Exercise Outputs	29
Workshop Presentation.....	29
CRB Workshop Presentation	39
Public Comment Period.....	44
MVP Listening Session Presentation.....	46

Town of Bernardston

Community Resilience Building Workshop

Summary of Findings

Overview:

Throughout Franklin County, Massachusetts, communities are experiencing more extreme weather events – especially heavy rains and flooding – along with higher temperatures and other climate-related conditions. Since 1970, average annual temperatures in Franklin County have increased by approximately three degrees Fahrenheit, with winter temperatures rising at a faster rate. These types of conditions are predicted to increase as a result of climate change. According to down-scaled climate data from resilientMA.org,¹ the major climate change drivers in Franklin County and Bernardston are:

- An increase in average temperature, as well as more extreme heat and extreme temperature fluctuations;
- An increase in annual precipitation and an increase in very heavy precipitation events – where more rain, snow, or ice falls in a short period of time – interspersed at times with very dry periods;
- Stronger storms with higher winds, due to an overall warmer climate with more moisture in the atmosphere.

In the face of these changes, municipalities are working to increase their resilience and adapt to natural hazards and extreme weather events. Relatively recent events in Franklin County, such as Tropical Storm Irene (August 29-30, 2011) and “Snow-tober” (October 28, 2011), have reinforced the need for resiliency planning and compelled communities like the Town of Bernardston to proactively plan and mitigate potential risks. This type of planning will reduce the vulnerability of Bernardston’s people, infrastructure and natural resources, and will empower Bernardston’s officials and citizens to take steps to protect themselves and their community.

In early 2020, with funding from the Massachusetts Executive Office of Energy and Environmental Affairs’ Municipal Vulnerability Preparedness (MVP) program, the Town of Bernardston hired the Franklin Regional Council of Governments (FRCOG) to assist the Town in completing the planning process to achieve designation as a Municipal Vulnerability Preparedness Community or “MVP” Community. As a State-certified MVP Provider, the FRCOG helped Bernardston engage in a community-driven process that brought together climate

¹ <http://www.resilientma.org/map/>

change information and local knowledge to conduct community outreach and the Community Resilience Building (CRB) workshop, whose central objectives were to:

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

This report summarizes the findings of the Town of Bernardston's Community Resilience Building Workshop.

Community Resilience Building: Stakeholder Outreach & Workshop

Stakeholder Outreach

The Town of Bernardston planned to hold their Community Resilience Building Workshop in late March 2020, but the meeting was ultimately cancelled due to the ongoing COVID-19 pandemic. In place of an in-person workshop, the Committee devised a plan to remotely complete the objectives of the MVP Planning process. The Town was committed to gathering input from community members in order to build the recommendations presented in the plan.

Beginning in May, the Committee compiled a list of forty-three community members, which was representative of Bernardston's farmers, local businesses, municipal departments and boards, and residents. Informational packets about the MVP program, risks associated with climate change, sample interview questions, and findings from Bernardston's recently updated Hazard Mitigation Plan were sent out to each stakeholder.

Committee members then called each stakeholder to conduct an interview to learn more about how their services, business, farm, or personal property (as applicable) had already been impacted by climate change and what their concerns are for the future considering Massachusetts' changing climate. Interviews were conducted with sixteen (16) stakeholders, which revealed a wide variety of concerns. Responses recorded during the interviews allowed the Committee to characterize the hazards impacting Bernardston, and the data gathered were presented during the virtual Community Resilience Building Workshop. Outreach packets and interviews are presented in the Appendix.



Summary of Findings

The Town of Bernardston, population 2,064, has conducted a number of planning projects in previous years, including its 2020 Hazard Mitigation Plan, which enabled the Town to identify high priority hazards as well as areas, infrastructure and populations vulnerable to a variety of hazards, and action items to potentially address hazards. Other recent Bernardston plans include: Town of Bernardston Master Plan (2016); Culvert Management Plan (2017); and Bernardston Center Village Groundwater Report (2018). The Town is planning on updating their Open Space and Recreation Plan this year.

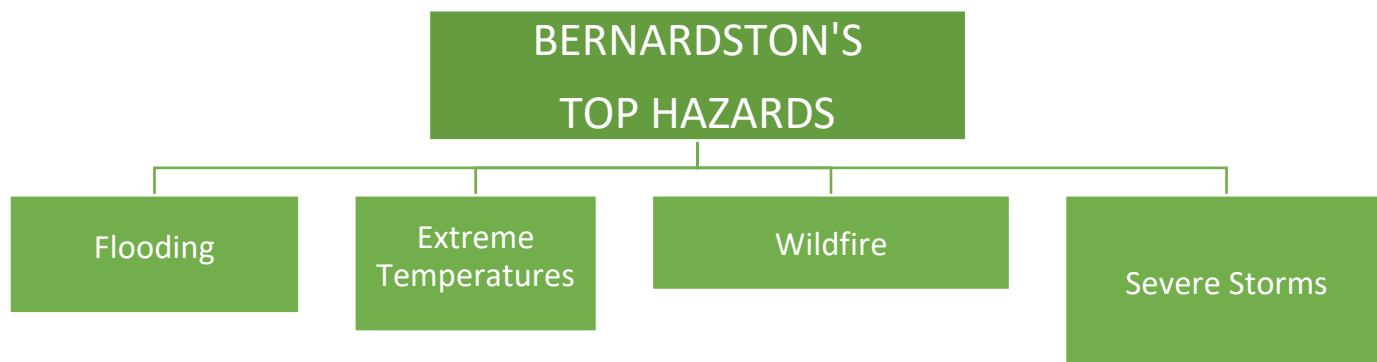
In spite of Bernardston's diligence in completing these planning efforts, there was still a need for the community to conduct a hazard assessment across scales – from individual buildings and bridges to rivers and landscapes, and across sectors – infrastructure, society and environment – looking specifically through the lens of climate change and its likely impacts.

Workshop participants considered climate change impacts most likely to affect Bernardston, including **rising and extreme temperatures, extreme weather events and increased precipitation**, both in quantity and intensity.

The workshop was critical to enabling participants to think about and engage with people from different sectors. People representing emergency management, highway, police, fire, administration, planning, water supply, library, energy committee, and interested residents came together to discuss the most threatening hazards to the Town of Bernardston and to agree upon high priorities and actions to address them.

Top Hazards

Workshop participants discussed a number of hazards that impact Bernardston, deliberating on how frequent, how intense and how widespread each hazard has been and could potentially be in the future. Hazards discussed included: dam failures, severe winter storms/ice storms, earthquakes, hurricanes, wind storms/microbursts, tornados, ice jams, floods, wild fires, landslides, droughts, human-made hazards and extreme temperatures. Top hazards identified by the participants are as follows:



Areas of Concern

Infrastructure and Transportation:

Sources of backup water supplies for firefighting are unmapped; limited emergency access routes for firefighting; prolonged power outages; downed trees on power lines; drainage ditches clogged with brush and yard debris; large box culverts in need of repairs or upgrades; drainage issues on dirt roads; clogged stormwater drains near private property; areas near railroad tracks with shrubby growth; important Town records are not backed up.



Facilities and businesses: Economic impacts of flooding, extreme heat, and drought on farms, economic impacts of severe storms on local businesses, outdated floodplain maps; lack of backup power for the DPW, Fire Department, and Town shelters.



Public health: Contamination of the public water supply due to beaver activity; Sugar Shack Well (primary public water supply well for the Town of Bernardston) is located close to the highway, which is heavily salted; insect-borne diseases; high water table in Bernardston's Center Village leading to flooded basements and septic system failures; respiratory illness associated with higher temperatures.

The impacts of increased precipitation can be seen throughout Bernardston, from the Town Center to the Charity Farm Lot.

People: Elders throughout Town; seniors on fixed incomes who may not be able to make costly repairs due to damage from flooding or severe storms; homes in the floodplain and/or wildland urban interface.

Ecosystems and natural resources: Frequent flooding in the Center Village/Cushman Park and the Darwin Scott Swamp due to increased water flow from Fox Hill Brook; many west to south facing slopes which are more vulnerable to wildfires; floodplains throughout Town; increase of invasive species on private and public property; erosion and sedimentation issues along Barton Brook.

Current Concerns & Challenges Presented by Hazards

Community members and participants in the workshop discussed a number of hazards that have affected the community in recent years, such as:

- Changes in precipitation including more ice and rain in the winter and increased amounts of precipitation falling in a short period
- Short-term, acute weather events including severe wind events, extreme and erratic temperatures
- Prolonged periods of drought and dry conditions, which increase the potential for a wildfire outbreak

Participants in the workshop expressed concern about current flooding issues in the Center Village/Darwin Scott Swamp and the possibility of the flooding issues becoming more severe in the future. The Swamp was historically farmed and was well drained, but after the land was donated back to the state, drainage ditches were no longer maintained and the area reverted to a wetland.² Without functional drainage and an increase in water flowing into the Center Village from upland areas, flooding is a frequent issue; beaver activity in the Darwin Scott Swamp has further exacerbated flooding issues. The DPW has recently cleared out and restored all of the drainage ditches along Fox Hill Brook, and the Town has worked to manage beaver activity but that has not slowed the rate of flow into the Center Village. More rain and ice in the winter will result in greater amounts of runoff from Fox Hill Brook and other high elevation areas in Town.

Temperature extremes, such as high heat and freezing temperatures were another top concern. The elderly are particularly vulnerable to extreme temperatures and may lack air conditioning or ways to adequately heat their homes. Extreme heat can also contribute to poor air quality by trapping emitted pollutants close to the ground, affecting people with asthma and other respiratory diseases as well as young children and the elderly. Many of the livestock farmers throughout Bernardston also noted that rising temperatures and the recent heat waves stress pigs and lambs, as well as crops that are typically used for feed.

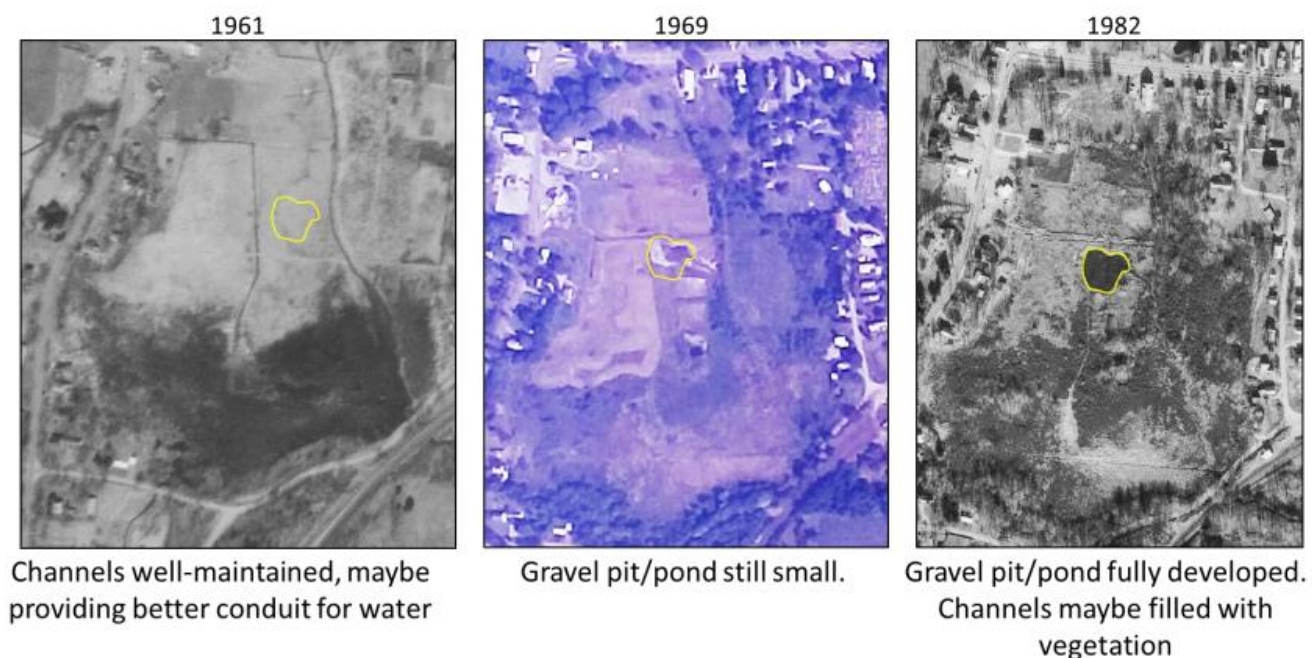
Severe storms were also identified as a top hazard. Community members recalled recent severe wind events that led to prolonged power outages and downed trees, as well as heavy precipitation events that caused significant erosion near the Charity Farm Lot and Barton Brook.

Wildfires have not recently occurred in Bernardston, but community members and workshop participants are concerned that the combination of increasingly dry conditions and many west to south facing slopes in the Town could lead to a wildfire in the future. Nearby Towns in Franklin County such as Leverett and Orange experienced wildfires during the Summer of 2020, which burned a total of more than 60 acres of land in each Town. These fires demonstrated how even mild drought conditions can increase the threat of wildfires.

² 2016 Bernardston Master Plan

Specific Categories of Concerns and Challenges

Flooding in the Bernardston Center Village: Workshop participants unanimously identified flooding in the Center Village as a top concern. As previously noted, land use changes near Center Village, changes in management practices (Figure 1 below), and an increase in the amount of water flowing into the area has exacerbated flooding issues over time. The frequency of flooding events varies with major storm events, but recurring floods started in 2005 and occur every year to some degree. The water table in Center Village is already naturally high due to local topography and geology, so increased precipitation is likely to further exacerbate flooding issues in the area. A hydrogeologic study on the rising groundwater table was completed in 2019 to investigate the relationship between septic system failures and the water table. The findings of the report indicated that while the septic failures appear to be unrelated to the rising water table, action will need to be taken in order to mitigate frequent flooding in the Center Village. Workshop participants also expressed concern about the standing water in the flooded park, as it can lead to increased risk of mosquito-borne diseases such as West Nile Virus and Eastern Equine Encephalitis (EEE).



Historic air photos of Darwin Scott swamp and surroundings. The yellow polygon indicates the location of the gravel pit excavation that developed into a pond. Source: Brian Yellen, Bernardston Center Village Groundwater Report.

Road Drainage: Workshop participants also discussed concerns with regard to inadequate road drainage throughout the Town, especially when considering the impacts of more frequent and intense precipitation events. Approximately 25% of the roadways in Bernardston are gravel, which are more vulnerable to washouts during heavy precipitation events.

Other specific concerns included residents encroaching on road right of ways and setting up berms to divert water off of their property, which has led to localized flooding. There have also

been instances of brush piles being swept into drainage ditches, which is especially problematic for the Town's roadways in the fall.

The Police Chief noted roads are often unpassable due to flooding during a storm event, which is one of their top concerns when there is a hazard. Emergency responders in Town are used to dealing with snow, ice, downed trees and other hazards but flooding causes the most disruption to their services. Areas of Town where streams cross Route 5 north of Center Village risk inundation and are of greatest concern, as residents might become isolated from emergency services if roads, bridges, or culverts were blocked or damaged due to flooding.

The Highway Department Superintendent has a culvert management plan and routinely repairs/replaces small culverts as needed to aid with increased stormwater runoff, but cannot replace failing box culverts due to equipment limitations. Repairing the culvert on Eden Trail Road is of interest to the Town, as the design work has already been completed.

Outdated Floodplain Maps: As noted in Bernardston's recently updated Hazard Mitigation Plan, the FEMA maps for Bernardston have not been updated since July 2, 1980. A new map needs to be developed based on present and forecasted conditions and publicly presented as a bylaw change. Bernardston is specifically interested in developing a LiDAR generated 500-year floodplain map and a 100-year/24-hour rainfall map that could be used for planning purposes. Workshop participants noted this is critical information for the Town to have, and some local business owners are interested in obtaining updated information so they can adequately assess their risk to flood hazards. Although FEMA has an ongoing project to update the Flood Insurance Rate Maps (FIRMS) used for the National Flood Insurance Program (NFIP), this project won't be completed and new maps issued for at least another 5-10 years. For now, the Town must use the existing 40-year-old FIRMs for the enforcement of their Floodplain Bylaw.

River corridor mapping is especially of interest along Keets Brook and the Fall River; new maps would help Town officials and emergency responders assess current and future risks.

Energy Resilience: The Water District, Fire Department, and Police Department all have backup generators. However, workshop participants mentioned that some of these facilities may be in need of new generators, and could benefit from backup battery storage. For example, the Fire Department does not have an automatic generator, and the DPW garage doesn't have a generator which limits the ability of the department to fuel their vehicles during a storm event. The Water District only has a backup generator at one of the two pump houses, but receives power from a solar array on their property power both well stations and the pump house. The District is interested in obtaining battery storage for backup during a storm event.

Outreach to local businesses also identified energy resilience as a key concern and need. Some farms and businesses have added, or would like to add, on-site renewable energy power sources, such as solar PV. Solar-powered back-up battery storage was identified as a need to increase resilience to extended power outages that could be devastating to a local business; this was especially noted as a concern for restaurants or bakeries where there is a potential for food spoilage.

The Bernardston Energy Committee is currently working on permitting and design for a solar array installation at the Town's capped landfill, and they are particularly interested in including backup battery storage.

Impacts of Drought, Heavy Precipitation, and Extreme Temperatures on Farms: Farmers in Bernardston are well acquainted with disruptions to their operations caused by storms, but outreach conducted over the course of this project identified many farmers are concerned about the impacts of climate change. Livestock and dairy farming is prevalent in Bernardston, so many of the concerns brought up were tied to the ability to grow feed and maintain their fields. Recent droughts have negatively impacted hay and corn production, which farmers rely on to feed their animals. The drought of 2016 was brought up during interviews, with one farmer mentioning it cost their farm a season's worth of feed for their cows. Additionally, heavy precipitation events can damage fields. Farmers noted that they have experienced damage from the combination of the storm events and then needing to run animals on wet, muddy fields. Extreme temperatures also pose risks for the livelihood of pigs and sheep. One farmer noted that pigs can't gain weight when temperatures exceed 95 degrees, and another farmer mentioned sheep do not do well when winter temperatures swing dramatically over the course of a few days.

Vulnerabilities related to wildfire: Participants also voiced concerns with regard to the possibility of a wildfire outbreak and the Town's ability to manage a fire. Bernardston's forests have many south to west facing slopes, which receive more solar radiation than other areas and increase the Town's vulnerability to a wildfire outbreak. These slopes are present due to the Town's specific geography. Combined with other factors such as more frequent and prolonged droughts, stands of dying Eastern Hemlock trees, and unmaintained private forestland, wildfire could spread very quickly throughout the Town. West Mountain Road and the northern part of Town in general was noted to be the area of greatest concern, as well as homes in the wildland urban interface. John Lepore, a Certified Ecological Restoration Practitioner, has identified well-drained soils in forested south and southwest facing slopes, but would need to complete further studies to dig into specifics on where the greatest wildfire risks are located.

Additionally, areas near railroad tracks with shrubby growth and track curves are at high risk of starting forest fires. Small forest fires have been sparked on a near annual basis near the tracks in the southeast corner of Town.

Lack of water for firefighting purposes is also a concern. The Town has access to fire ponds, but they may run dry during a drought. Workshop participants agreed on the need to identify additional sources of water that could be used for firefighting. The Fire Chief noted that the Department is generally hesitant to use hydrants throughout Town because the water main system is fragile; therefore infrastructural vulnerabilities could further complicate firefighting efforts.

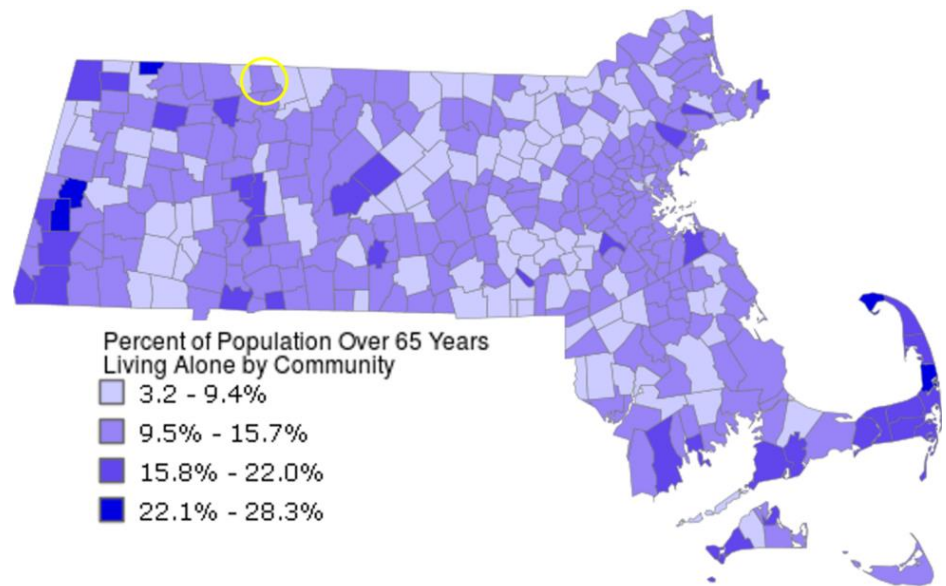
The Fire Department has identified a need to locate and map all water resources in the Town that could be used for firefighting, in addition to mapping how to access high-risk areas. Completing this project would require the Town to work with landowners and other community stakeholders to determine where reliable water resources are located, and to form agreements

for access. Community input would also be beneficial to determine which areas in Town may be at greatest risk for wildfire outbreaks.

Town Trees: Bernardston has a tree warden who can address some issues, but the Town lacks the resources to develop and maintain the perpetual existing hazards created by trees. More planning and funding is needed for the Town to remove and manage the hazardous trees that currently threaten to block roads and damage the power grid. Improved communication and coordination between the Tree Warden and Eversource is needed. Residential properties also harbor a large number of hazardous trees in town, and residents need support with managing and paying for needed tree maintenance, which can be very expensive. Additionally, shifting temperature regimes are changing the overall composition of northern hardwood forests, which may affect the Town's tree canopy.

Ability of Seniors to Age in

Place: Workshop participants also discussed how climate change may impact the ability of many seniors to age in place. Flooding was noted to have damaged the homes of seniors in Bernardston, which can be costly to repair. Seniors on fixed incomes may not be able to afford needed repairs. Additionally, concerns were raised about some seniors not having air conditioning in the summer months, and during the winter they may be reluctant to turn on the heat due to the high cost of fuel.



Approximately 10-15% of seniors in Bernardston live alone. Source: resilientMA.org

Emergency responders in Bernardston already keep track of seniors who require assistance during an emergency, but the Town is interested in further developing their understanding of needs based on different natural hazards. For example, it would be helpful for the town to develop a flooding or wildfire vulnerability assessment and analyze where high-risk areas overlap with vulnerable residents in the Town. Emergency Responders would like to work with community members to develop this risk assessment to ensure the safety of the Town's vulnerable populations.

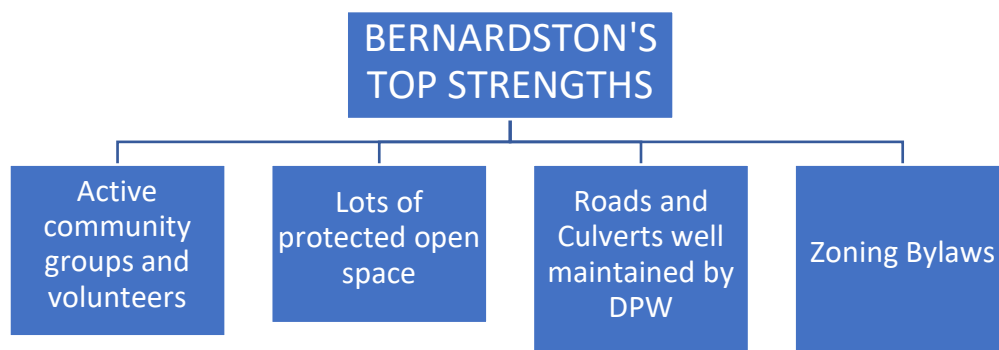
Quality of Water Supply: Water quality degradation was also discussed as a top concern during interviews and the workshop. The Chair of the Fire & Water District noted road salt applied during the winter impacts water quality and corrodes the water mains. Application of road salts followed by heavy precipitation may further exacerbate this issue; this is especially of concern as the Sugar House Well is located next to Interstate 91. Workshop participants also noted there

is a significant amount of beaver activity near the pump house, which may also negatively impact the Town's water supply.

Town Records: No redundancy or digital backup exists for Town Hall documents. If the Town hall was destroyed, all records, except for the few choice, historic ones stored in the library's vault next door, would be lost. The Town needs all critical documents professionally cataloged and digitized for safe, offsite backup and storage. This essential need is beyond financial capabilities, so, outside funding is essential.

Current Strengths and Assets

Bernardston's emergency planning and response procedures are regularly reviewed and updated. The Town has taken a proactive approach to emergency preparedness, which was evident at the workshop as participants readily provided known vulnerabilities, but also strengths and actions to address these vulnerabilities. Participants cited several strengths and assets that help keep their community resilient in the face of climate change and other challenges. They include:



Societal Strengths and Assets: These include Bernardston's informal community leaders, neighborhood groups and communication networks. Participants said that there is a strong sense of community in the Town, and neighbors are always willing to help each other out during emergencies. The Council on Aging was noted to work closely with the Town's emergency services in order to conduct check-ins during severe storm events, or to ensure seniors have access to heating or air conditioning as needed. Other groups mentioned included the Selectboard, Planning Board, and Conservation Commission, who are all dedicated to the Town's operations and preserving its resources.

Lots of protected open space: Workshop participants noted that there are many protected open spaces throughout the Town, such as Kiwanis Park, Cushman Park, and the Darwin Scott Swamp. Although the Darwin Scott Swamp does have issues with flooding, workshop participants mentioned it attracts lots of wildlife such as bears, deer, and waterfowl. Charity Farm Lot was also mentioned, which is a 90-acre site that was donated to the Town back in the 1800s and is now going through major renovations (such as the addition of hiking trails) thanks to the efforts of volunteers. Bill Montiglio and John Lepore are leading the volunteer effort, and are a recognized Committee by the Select Board.

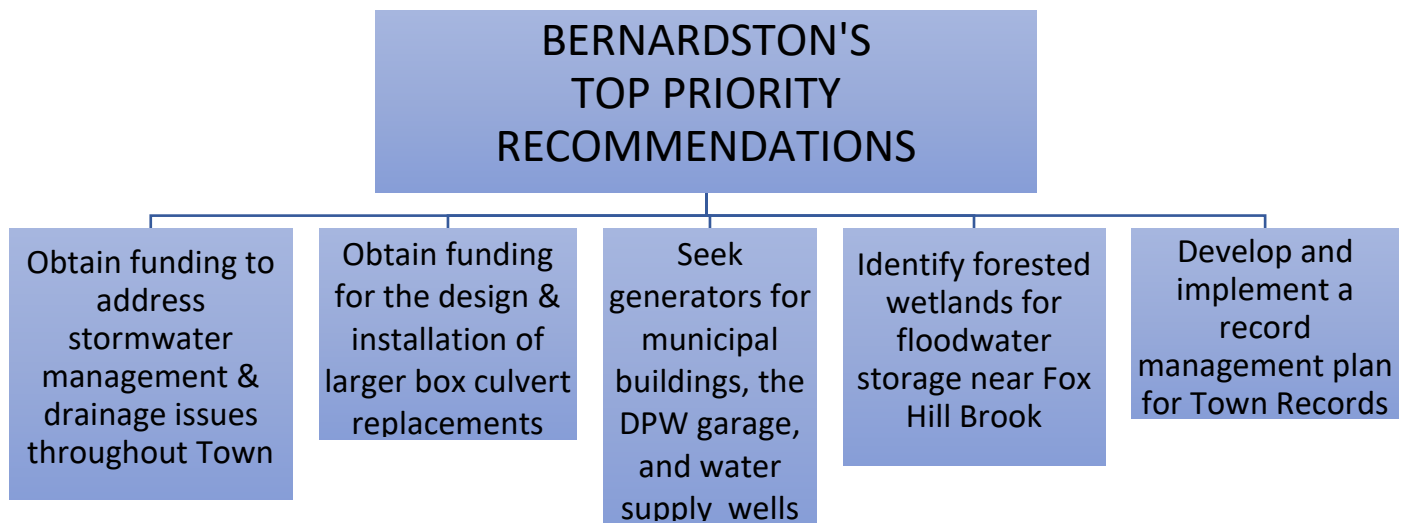
Culvert and Road Maintenance: As previously mentioned, the DPW routinely fixes and upgrades culverts throughout Town to mitigate stormwater runoff and improve road drainage. Bernardston had their culverts mapped in 2015 and maintains a Culvert Management Plan to prioritize and keep track of ongoing repairs.

Zoning Bylaws: The Planning Board recently updated the Town's zoning bylaws to include a

Low Impact Development (LID) bylaw. The Board is actively interested in updating the Flood Plain District bylaw using the Commonwealth's new Model Floodplain Bylaw.

Top Recommendations to Improve Resilience

At the conclusion of Bernardston's virtual MVP workshop, participants voted on the resiliency actions brainstormed during the meeting, and then ranked all of the actions via a poll in Survey Monkey. Full results from the survey are shown in the Appendix. Poll results were consolidated as appropriate to develop Bernardston's top priority recommendations as shown below. Recommendations address key vulnerabilities while building upon current strengths. Relevant recommendations from the Town's recently completed Hazard Mitigation Plan were incorporated into the vulnerability matrix as appropriate.






Obtaining funding to address stormwater management & drainage issues topped the list of highest priority recommendations. This action item includes obtaining funding for surveying road boundaries, completing a Rural Roads/Dirt Roads Assessment, and developing an education and outreach plan for residential stormwater management.


Obtaining funding for the design and installation of box culverts is also a top priority recommendation in order to address failing culverts Bernardston's DPW is not able to replace with their own equipment.


Seeking generators/backup power for municipal buildings, the DPW garage, and water supply wells is a high priority recommendation, as several departments do not have automatic generators. The Town could also consider looking into options for onsite power generation using renewable energy and combining it with battery storage.


Identifying forested wetlands for floodwater storage near Fox Hill Brook is also considered a top priority recommendation. Flooding in the Bernardston Center Village is a known and ongoing issue in the Town, and developing a nature based solution to mitigate runoff is of interest.


Developing and implementing a record management plan for Town records is essential for the Town. Without digital copies of key records, the Town is at risk of losing important documentation due to storm damage.


Community Resilience Building Risk Matrix				  			www.CommunityResilienceBuilding.org				
<u>H</u> - <u>M</u> - <u>L</u> priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>O</u> ngoing) <u>V</u> = Vulnerability <u>S</u> = Strength				Recommendations	Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time	
									<u>H</u> - <u>M</u> - <u>L</u>	<u>S</u> hort <u>L</u> ong <u>O</u> ngoing	
									Features	Location	Ownership
Infrastructural											
Culverts and Bridges	Culvert on Eden Trail Road at Mill Brook, other locations throughout Town	Town/State	S/V	Culverts and bridges throughout town are undersized and in need of upgrades/replacements to increase their capacity and to minimize or repair damage from hazard events. Obtain funding to complete repairs/replacements of larger box culverts in Town, such as the culvert on Eden Trail Road. For smaller culverts in Town, the Highway Department maintains a Culvert Management Plan to prioritize repairs. All culverts in Town are mapped. The Highway Department proactively makes repairs.	X				X	H	S
Town Records	Town Hall	Town	V	Most of the Town's records are stored in un-catalogued boxes on the Town hall's second floor. Since there is no offsite backup, the Town's critical documents are at high risk of being permanently lost. The Town should develop and implement a record management plan to digitize and/or duplicate important records.	X			X	X	H	S
	Municipal Departments (such as the Highway, Fire, and Police depts.)	Town	S/V	Most departments in Town are working on developing Continuity of Operation Plans (COOP) and are incorporating record backup into their plans.	X			X	X	H	S
Dirt Roads	Town-wide	Town	V	25% of the roads in Bernardston are gravel; maintaining proper drainage on these roads is important to ensure access during an emergency and to decrease sediment loads into the Town’s wetlands. Obtain funding for a Rural Roads/Dirt Road assessment to determine low maintenance, low cost climate resilient drainage solutions.	X			X	X	H	S
Public Water Supplies	Town-wide	Town	V	The Fire and Water District has one standby generator for the two pump houses. There is a solar field on the property that the District owns that can fully power both well stations and the pump house, however it does not currently have battery storage. Investigate options to gain additional backup power supply.	X		X		X	M	L




Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
H-M-L priority for action over the S hort or L ong term (and O ngoing) V = Vulnerability S = Strength				Recommendations	Top Priority Hazards					
					Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time
Features	Location	Ownership	V/S						H - M - L	S hort L ong O ngoing
	Town-wide	Town	V	One of Bernardston’s wells is located close to I-91, which is a heavily salted road, and has led to water quality degradation. Continue to contact MassDOT to advocate for low salt/no salt zones near the water well.	X	X		X	M	Ongoing
Public Buildings	Town-wide	Town	V	The Police Department has a backup generator, and the Fire Department has a generator but it is not automatic. The Highway Department needs to obtain backup power in order to ensure they can fuel vehicles during an emergency. Other municipal buildings in Town don’t have backup power. Evaluate public buildings for onsite power generation using renewable energy, such as solar PV, coupled with battery storage to increase resiliency. Consider a mobile battery generator as an option. Continue to implement energy efficiency measures to reduce overall energy use in municipal buildings through the Green Communities Program.	X	X		X	H	Ongoing
Communications with Residents	Town-wide	Town	S	Bernardston has an active CodeRED emergency notification system. Continue to promote signups to ensure residents have access to emergency information.	X	X	X	X	L	Ongoing
Evacuation Options	Town-wide	Public / Private	V	Residents rely heavily on Route 91 and Routes 5/10 for evacuation. Explore options such as real-time reporting through the internet to provide residents with up to date information about routes that are available and to report road closures.	X		X	X	L	Ongoing
Battery Storage	Transfer Station	Town	S	The Town is working on a feasibility study for battery storage at the solar array that will be installed at the Town’s transfer station. If feasible, pursue grant funding to purchase necessary infrastructure.		X		X	M	S
Water for firefighting	Unknown	Town	V	Bernardston does not have a map of available water supplies to reference in the event of a wildfire outbreak, or a map showing ATV trails/other routes that could be used to access high risk areas. Obtain funding to develop a map of available water supplies and access routes. Development of such a map should incorporate robust community outreach in order to identify resources and form agreements for access. Once complete, distribute the map to relevant departments in Town.		X	X	X	H	S / Ongoing

Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
H-M-L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength				Recommendations	Top Priority Hazards					
					Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time
Features	Location	Ownership	V/S						H - M - L	Short Long Ongoing
Senior Center	Church Street	Town	S/V	Bernardston has an active Senior Center, which provides many important services to the community. However, the building doesn't have a covered ramp to ensure safe access for the building during a hazard event. Seek funding to install a covering.	X			X	L	S
Drainage Ditches/Blocked Culverts	Town-wide	Town	V	Drainage ditches and culverts are often blocked by snow, brush piles, and lawn debris. Conduct education and outreach to residents to inform them about best practices for managing stormwater runoff.	X			X	H	S
Local Businesses	Bernardston Center	Private	S	Several local businesses have taken steps to safeguard their operations from the impacts of climate change, but some business owners would like to have more information about how they could be impacted and what they could do to be better prepared. Promote a network of local business owners to facilitate communication & resource/information sharing.	X	X	X	X	L	Ongoing
Societal										
Evacuation	Route 91; Routes 5&10	Private	V	People living or working in Bernardston without access to personal transportation may need help evacuating. Agreements with transit authorities and bus companies should be updated or established.	X		X	X	M	S / Ongoing
Sheltering	Elementary School; Library	Town	S	Bernardston has three locations designated as warming/feeding facilities (Elementary School, Senior Center, and Vets Club), and participates in the regional sheltering program through the Franklin County Regional Emergency Planning Committee. Continue to provide residents with timely information about sheltering options. Work to identify areas that could be used for staging, and work to identify solutions for backup power at the warming/feeding shelters.	X	X	X	X	L	Ongoing
Elderly, isolated, and residents with medical / special needs	Town-wide	Private	V	Promote the formation and maintenance of neighborhood groups. Continue to track vulnerable populations in Bernardston; encourage seniors to sign up with TRIAD.	X	X	X	X	L	Ongoing

Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
H-M-L priority for action over the S hort or L ong term (and O ngoing) V = Vulnerability S = Strength				Recommendations	Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time
									H - M - L	Short Long Ongoing
Features	Location	Ownership	V/S							
			S/V	Expand and maintain the Town’s current tracking system for vulnerable residents. Seek funding to conduct an assessment to determine where flooding, wildfire, power outage and other climate risks exist and overlap with vulnerable populations. Conduct community outreach to determine the level of assistance needed during different types of hazards.	X	X	X	X	H	Ongoing
Home heating & cooling	Town-wide	Private	V	Elderly and low-income residents may lack air conditioning and safe ways to heat their homes. Promote Mass Save, including the income-eligible program through Community Action Pioneer Valley, for insulation, air sealing, and heating system/appliance upgrades.			X	X	M	S / Ongoing
Environmental										
Flooding in Bernardston Center Village	BCV	Town/Private	V	Flooding is a consistent issue in Bernardston’s Center Village. Seek funding to design and implement nature based solutions to mitigate flooding issues. Such solutions could include promoting the rapid runoff of surface water from the margins of the Bernardston Center Village to Darwin Scott Swamp or draining storm water in the upper Fox Hill Brook watershed via retention ponds or reconnection to forested floodplain where available. Work with private landowners as needed to identify parcels of land that could be used for floodwater storage.	X			X	H	S/Ongoing
Farms	Throughout Town, many in the southern part of Town	Private	S/V	Farms are vulnerable to extreme weather, flooding, and drought. Assist farms with assessing and prioritizing climate resiliency options to protect crops, farm fields, and farm workers from extreme weather, such as greenhouses, irrigation systems, and innovative drainage solutions, and identify funding for implementation.	X	X	X	X	M	Ongoing
Roadside Trees	Town-wide	Private/Public	S/V	Examine strategies for improving the Town’s existing hazard tree program, such as improving and encouraging coordination between Eversource and the Bernardston Tree Warden. Review what equipment is available to the Tree Warden and identify what is needed. Look for ways to improve the process of identifying tree hazards.	X		X	X	M	Ongoing

Community Resilience Building Risk Matrix				<div>  </div> <div>www.CommunityResilienceBuilding.org</div>						
H-M-L priority for action over the S hort or L ong term (and O ngoing) V = Vulnerability S = Strength				Recommendations	Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time
									H - M - L	S hort L ong O ngoing
Features	Location	Ownership	V/S							
Floodplain	Floodplain	Private/Public	V	The floodplain maps for Bernardston are out of date. In addition to completing a vulnerability assessment once FEMA updates the 100-year floodplain maps, hire a consultant to develop a LiDAR based 500-year floodplain map and a 100-year/24-hour rainfall map that can be used for planning purposes. Once maps are updated, obtain funding and update the Town’s vulnerability assessment for properties located within the 100-year floodplain (in the Hazard Mitigation Plan) and to conduct community outreach to ensure local knowledge is reflected in the vulnerability assessment. Additionally, conduct outreach to property owners about their risk to flood damage and provide information about the NFIP flood insurance program as needed.	X			X	H	S
River Corridor Mapping	Fall River, Keets Brook	Private/Public	V	Hire a consultant to map the river corridors for the Fall River, Keets Brook, and other key tributaries.	X				H	S
			V	Consider zoning changes to add a River Corridor Overlay District to ensure public safety and healthy watershed function along the Fall River and Keets Brook.	X				H	S
			S	Conduct outreach to residents about the flood mitigation benefits of managing and protecting lands in the river corridor. Review completed corridor maps and floodplain vulnerability assessment with residents.	X				H	S
Residential Landscapes	Town-wide	Private	V	In concert with the action item about residential stormwater management in the <i>Infrastructure</i> section, educate residents about the environmental impacts of maintaining a lawn with low permeability. Conduct community outreach to teach residents and students at the Bernardston Elementary School about planting pollinator gardens, rain gardens, vegetable gardens, and other simple but effective solutions to increase permeability. Working with residents in the Center Village watershed is a priority, as this area is subject to frequent flooding.	X	X		X	H	S/Ongoing
Water Resiliency and Stormwater Management	Municipal Buildings	Public	S/V	Seek funding to design and implement raingardens and rainwater harvesting systems at municipal buildings and on town owned land. In line with the above action item, educate residents about rain gardens and rain barrels and guidance on their installation, maintenance, and appropriate uses of stored rainwater.		X			M	O

Community Resilience Building Risk Matrix				 www.CommunityResilienceBuilding.org						
H-M-L priority for action over the S hort or L ong term (and O ngoing) V = Vulnerability S = Strength				Recommendations	Top Priority Hazards					
					Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time
Features	Location	Ownership	V/S						H - M - L	Short Long Ongoing
Insect/animal borne diseases + pest control	Town-wide	N/A	S	Bernardston is a part of the Pioneer Valley Mosquito Control District, which allows the Town to trap and test mosquitoes for diseases such as EEE and West Nile Virus. Educate residents about how to be notified of planned spraying by the State, and how to opt-out of spraying. Educate residents about risks associated with vector-borne diseases and actions they can take at home to protect their community, such as eliminating sources of standing water.	X	X			L	Ongoing
Wildland urban interface	Town-wide	Private	V	Conduct a GIS-based forest fire risk assessment to better determine which areas in Town are at highest risk for a wildfire outbreak. While completing the risk assessment, conduct community outreach to identify additional high-risk areas.		X	X	X	M	S
			V	Many homes are located within the wildland urban interface. Conduct public education and outreach to residents to explain the increasing risk of wildfires due to climate change, and steps they can take to be better prepared for a wildfire.			X		M	S
Town-owned forested areas	Town-wide	Town	S/V	Identify Town-owned forested areas that are at higher risk for wildfires (near industrial manufacturing, residential areas, high-wire utilities, etc.) to implement climate resilient forest management practices that reduce the risk of fire hazards (such as the removal of slash). Areas that will soon have outdated forest management plans (such as the Charity Farm lot) should be considered.		X	X		M	L
Privately owned forested areas	Town-wide	Private	S/V	Seek funding and technical assistance to develop educational materials and conduct outreach to landowners to encourage forest stewardship practices that produce more stable, successional forested landscapes and which reduce the risk of fire hazards and landslides. Encourage forest owners to use the USFS Adaptation Workbook to determine adaptation efforts would be right for their property. Distribute these materials via the Town website, Assessor's office tax mailings, and Conservation Commission.		X	X	X	L	L

Community Resilience Building Risk Matrix				<div>    </div> <div>www.CommunityResilienceBuilding.org</div>						
<u>H</u> - <u>M</u> - <u>L</u> priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>O</u> ngoing) <u>V</u> = Vulnerability <u>S</u> = Strength				Recommendations	Top Priority Hazards					
					Flooding	Extreme Temperatures	Wildfire	Severe Storms	Priority	Time
Features	Location	Ownership	V/S						<u>H</u> - <u>M</u> - <u>L</u>	<u>S</u> hort <u>L</u> ong <u>O</u> ngoing
Pollinator Corridors	Priority Areas	Public	S/V	Pursue funding to implement actions from Bernardston's completed <i>Pollinator Action Plan</i> to form corridor linkages throughout Franklin County that will sustain ecologically important pollinators. Conduct public education and outreach to residents and students at the Bernardston Elementary School to teach them about the importance of pollinator corridors, and actions they can take at home to support pollinator habitats.					M	L

High Priority Recommendations

- Hire a consultant to identify opportunities for upland stormwater/floodwater management and storage in the Fox Hill Brook watershed to alleviate persistent flooding issues in Bernardston Center Village. Work with private landowners as needed to identify parcels of land that could be used for floodwater storage. Identify project types, locations, conceptual designs and cost estimates.
- Obtain funding to address stormwater management & drainage issues throughout Town. This includes:
 - Funding for surveying road boundaries in order to mitigate drainage issues
 - Funding for a Rural Roads/Dirt Roads Assessment
 - Developing an education and outreach plan for residential stormwater management
 - Conducting education and outreach to residents to inform them about best practices for managing stormwater runoff, such as keeping drainage ditches and culverts clear of snow, leaves, and yard debris
 - Educating residents and students at the Bernardston Elementary School about the environmental impact of maintaining lawns with low permeability and providing information about planting pollinator gardens, rain gardens, vegetable gardens, and other but simple but effective stormwater management solutions. Working with residents in the Center Village watershed is a priority, as this area is subject to frequent flooding.
- Purchase generators/backup power for municipal buildings and the DPW garage, and consider options for onsite power generation using renewable energy and combining it with battery storage
- Develop and implement a record management plan for Town records
- Obtain funding for the design and installation of undersized culverts throughout Town culverts, and obtain funding for the culvert replacement on Eden Trail
- Obtain funding to develop a map of available water supplies and access routes. Development of such a map should incorporate robust community outreach in order to identify resources and form agreements for access. Once complete, distribute the map to relevant departments in Town
- Expand and maintain the Town's current tracking system for vulnerable residents. Seek funding to conduct an assessment to determine where flooding, wildfire, power outage and other climate risks exist and overlap with vulnerable populations. Conduct community outreach to determine the level of assistance needed during different types of hazards.
- Hire a consultant to map the river corridors for the Fall River, Keets Brook, and other key tributaries.

- Consider zoning changes to add a River Corridor Overlay District to ensure public safety and healthy watershed function along the Fall River and Keets Brook.
- Conduct outreach to residents about the flood mitigation benefits of managing and protecting lands in the river corridor. Review completed corridor maps and floodplain vulnerability assessment with residents.

Medium Priority Recommendations

- Investigate options to gain additional backup power supply for the Fire & Water District to improve resiliency
- Continue to advocate for no/low salt areas on I-91 near the Sugar Shack well to prevent water quality degradation
- The Town is working on a feasibility study for battery storage at the solar array that will be installed at the Town's transfer station. If feasible, pursue grant funding to purchase necessary infrastructure.
- Bernardston doesn't have a map of available water supplies to reference in the event of a wildfire outbreak. Obtain funding to develop a map and distribute to relevant departments in Town.
- People living or working in Bernardston without access to personal transportation may need help evacuating. Agreements with transit authorities and bus companies should be updated or established.
- Elderly and low-income residents may lack air conditioning and safe ways to heat their homes. Promote Mass Save, including the income-eligible program through Community Action Pioneer Valley, for insulation, air sealing, and heating system/appliance upgrades.
- Conduct a farm resiliency study to assist farms with assessing and prioritizing climate resiliency options to protect crops, farm fields, and farm workers from extreme weather, such as greenhouses, irrigation systems, and innovative drainage solutions, and identify funding for implementation.
- Examine strategies for improving the Town's existing hazard tree program, such as improving and encouraging coordination between Eversource and the Bernardston Tree Warden. Review what equipment is available to the Tree Warden and identify what is needed. Look for ways to improve the process of identifying tree hazards.
- Conduct a GIS-based forest fire risk assessment to better determine which areas in Town are at highest risk for a wildfire outbreak. While completing the risk assessment, conduct community outreach to identify additional high-risk areas.

- Conduct public education and outreach to residents to better prepare them for a wildfire.
- Identify Town-owned forested areas that are at higher risk for wildfires (near industrial manufacturing, residential areas, high-wire utilities, etc.) to implement climate resilient forest management practices that reduce the risk of fire hazards (such as the removal of slash). Areas that will soon have outdated forest management plans (such as the Charity Farm lot) should be considered.
- Many homes are located within the wildland urban interface. Conduct public education and outreach to residents to explain the increasing risk of wildfires due to climate change, and steps they can take to be better prepared for a wildfire.
- Pursue funding to implement actions from Bernardston's completed *Pollinator Action Plan* to form corridor linkages throughout Franklin County that will sustain ecologically important pollinators.
- Conduct public education and outreach to residents and students at the Bernardston Elementary School to teach them about the importance of pollinator corridors, and actions they can take at home to support pollinator habitats.
- Create rainwater harvesting systems on municipal buildings and land and educate residents about rain barrels and guidance on their installation, maintenance, and appropriate uses of stored rainwater.

Low Priority Recommendations

- Continue to promote signups to ensure residents have access to emergency information.
- Secure funding to build a cover over the ramp at the entrance of the Senior Center
- Continue to provide residents with timely information about sheltering options.
- Promote the formation and maintenance of neighborhood groups. Continue to track vulnerable populations in Bernardston; encourage seniors to sign up with TRIAD.
- Educate residents about risks associated with vector-borne diseases and actions they can take at home to protect their community, such as eliminating sources of standing water.
- Seek funding and technical assistance to develop educational materials and conduct outreach to landowners to encourage forest stewardship practices that produce more stable, successional forested landscapes and which reduce the risk of fire hazards and landslides. Distribute these materials via the Town website, Assessor's office tax mailings, and Conservation Commission.

- Promote a network of local business owners to facilitate communication & resource/information sharing about how to be prepared for climate change.

CRB Workshop Participant -- Department/Commission/Representative:

Bill Meese, Conservation Commission
Brian Keir, Selectboard
Brian Miner, Highway Department
Hayley Bolton, Senior Center Director*
Jean Page, Board of Health
Jim Palmeri, Police Chief
Karen Stinchfield, Library
Mark Abrahamson, Agricultural Commission*
Barbara Killen, Board of Health
Peter Shedd, Fire Department*
Stanley Garland, Selectboard
Andrew Smith, MA EoEEA

Interview Respondents:

Regina Grover, River Maple Farm
Val Deane, Stoney B Acres
Jim Counihan, The Heirloom Collective
Paul Skiathitis, Four Leaf Restaurant
Craig White, Hillside Pizza
Clayton Cardin, Antonio's II
Bill Pachalis, Fire & Water District
Kevin Snow, Fire & Water District
Rawn Fulton, Planning Board
Peter Nai, Planning Board
Mark Duprey, Leyden Glen Farm
Tyler Sage, Sage Farm
Lucy Damkohler, Sweet Lucy's Bakery

*Completed an interview and participated in the virtual CRB

CRB Workshop Project Team: Organization and Role

Town of Bernardston

John Lepore, Project Manager, Certified Ecological Restoration Practitioner
Christina Wysk, Planning Board Chairperson

Franklin Regional Council of Governments:

Kimberly Noake MacPhee, Land Use & Natural Resources Program Manager
Allison Gage, Land Use & Natural Resource Planner
Alyssa Larose, Senior Land Use & Natural Resource Planner
Helena Farrell, Land Use & Natural Resource Planner
Megan Rhodes, Senior Land Use & Transportation Planner
Ryan Clary, Senior GIS Specialist

Recommended Citation

Noake MacPhee K. Gage A. (2020) Town of Bernardston Community Resilience Building Workshop Summary of Findings. Franklin Regional Council of Governments.

Photo credits:

Cover Photos: John Lepore

Page 6: Photos of flood damage throughout Town provided by John Lepore

Appendices

Maps

Outreach Packets

Interview Responses

Exercise Outputs

Workshop Presentation

Hazards and Infrastructure, Bernardston, Massachusetts

Flood Related
 Dam
 100 YR Flood Plain
 Localized Flooding
 Man-made Ponds

Evacuation Route
 Alternative
 Primary
 Secondary
 Tertiary

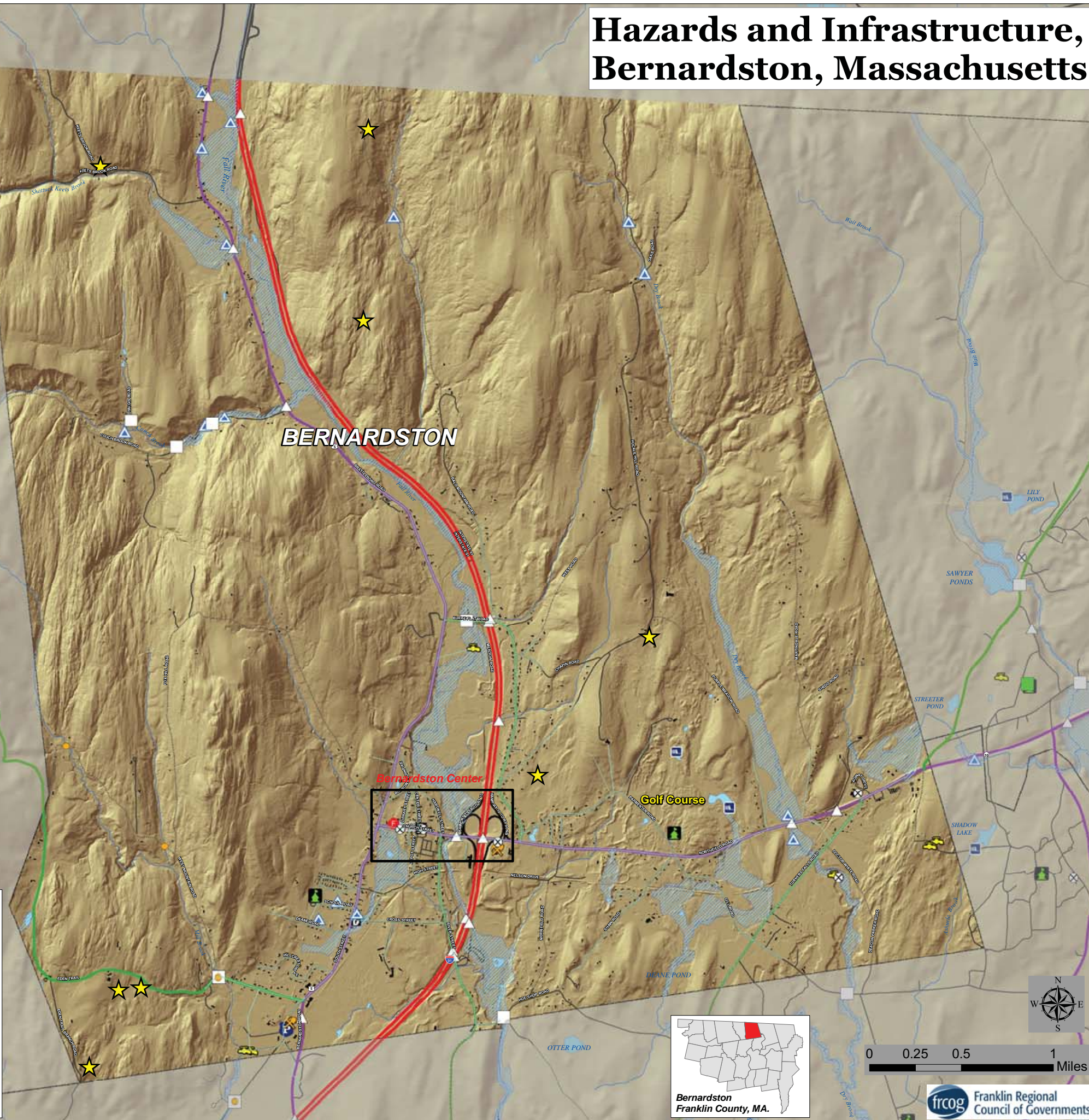
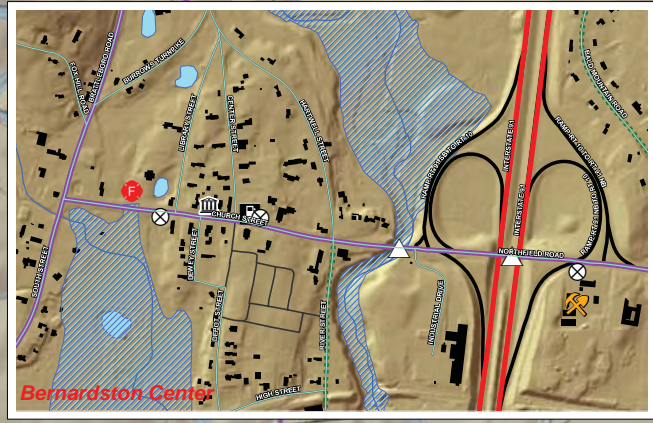
Radio Tower
 Public Water Supply
 Sewage Treatment Plant
 Water Line
 Chemical Facility
 Gas Station
 Transmission Line

School
 Library
 Town Hall
 Fire Station
 Police Station
 DPW
 Ambulance

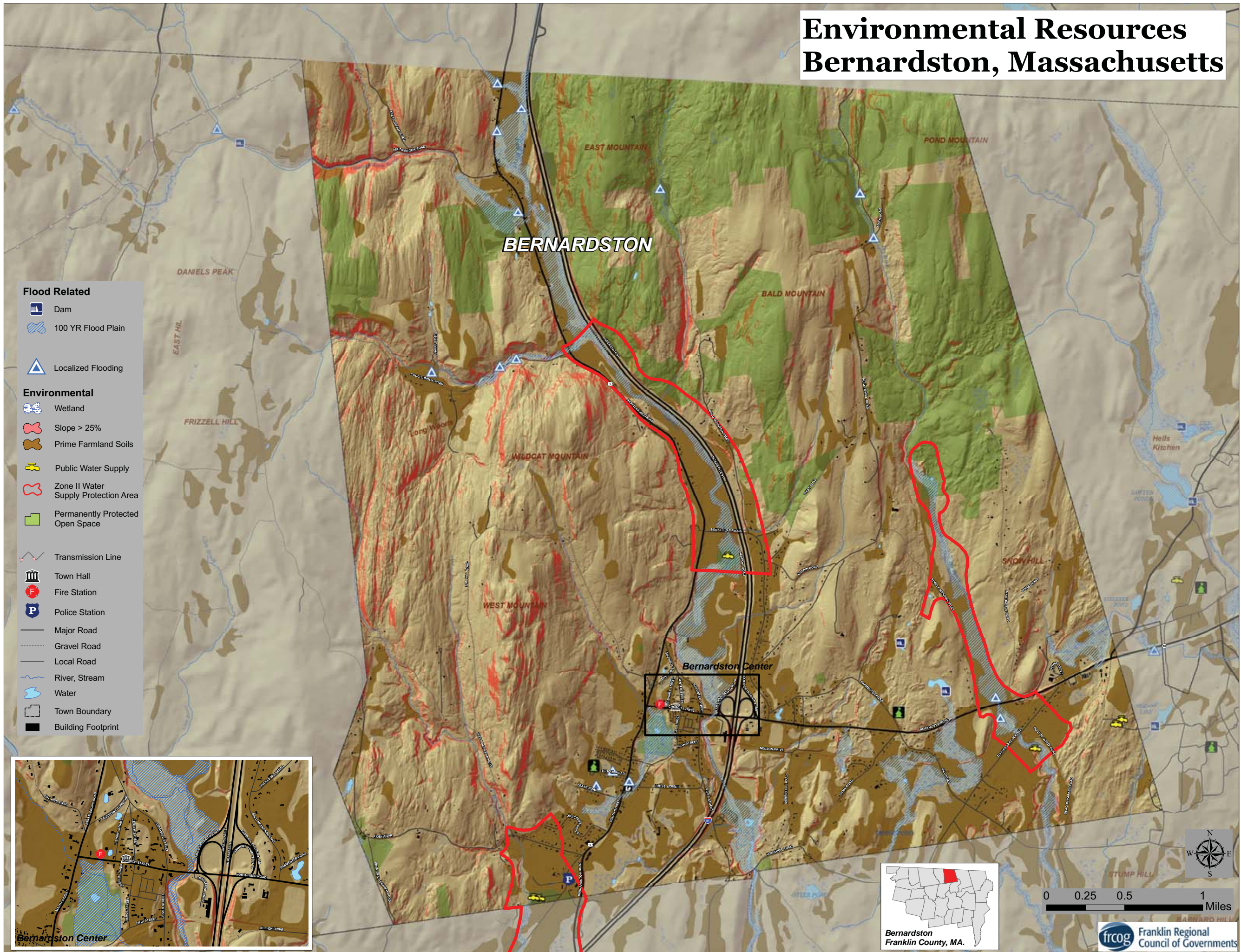
Water Crossings
Bridge Ownership
 MassDOT
 Municipal

Risk of Failure*
(includes culverts)
 High
 Medium
 Low
 No Data
 Major Road
 Gravel Road
 Local Road
 River, Stream
 Water
 Town Boundary
 Building Footprint

*data for crossings within Deerfield watershed only

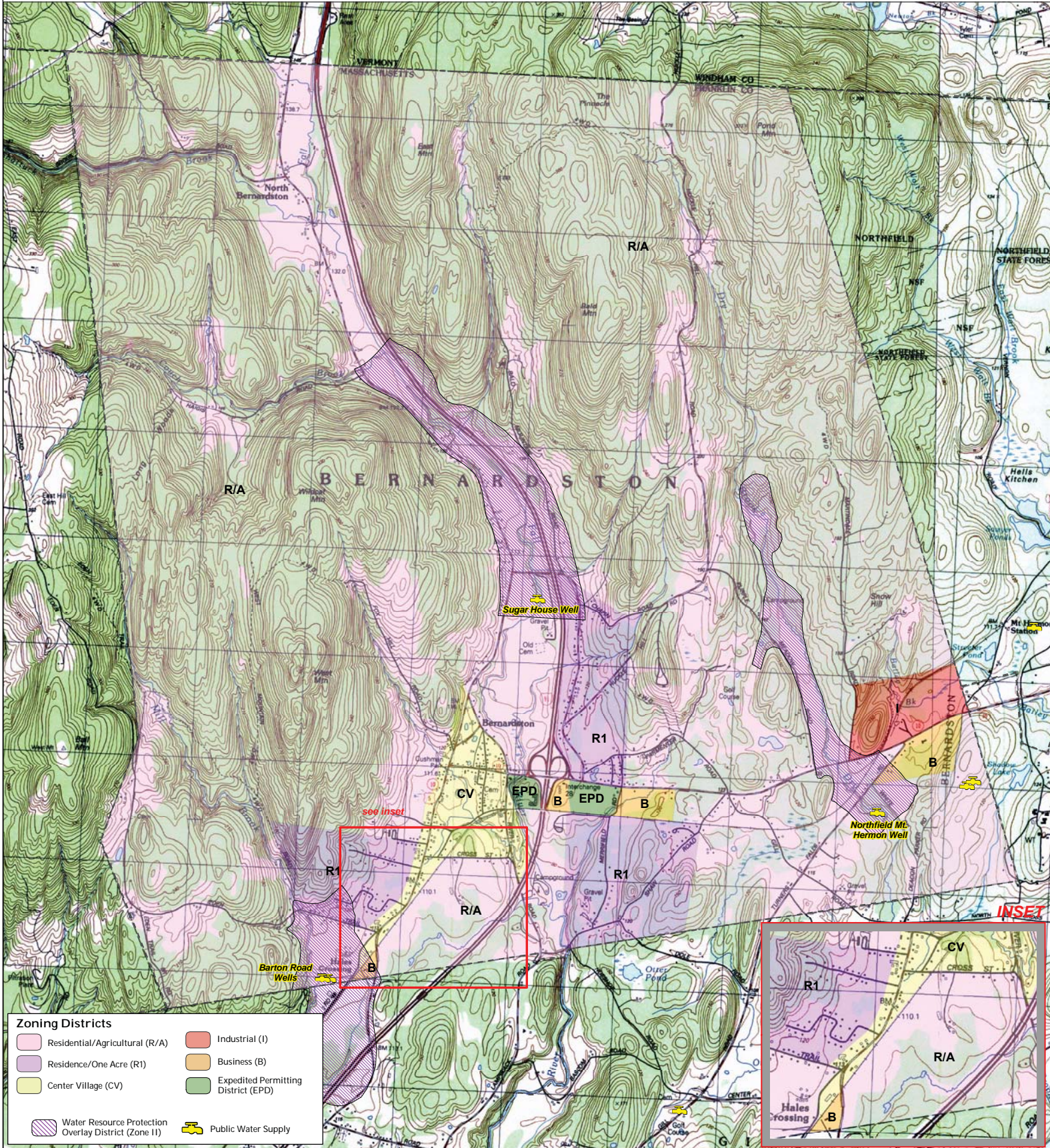


Environmental Resources Bernardston, Massachusetts



Town of Bernardston Official Zoning Map

March 9, 2020



Town of Bernardston



Office of the Selectboard

Brian J. Keir

Robert R. Raymond, Chairman

Stanley D. Garland

April 27, 2020

Dear Bernardston Community Member:

Increasingly, we find ourselves working to respond to more unpredictable and severe weather events that damage Bernardston's infrastructure, natural resources, and local economy and threaten the health and welfare of our residents. The costs and impacts to our town remind us that we need to continue working to reduce our risk and increase our resilience – being able to effectively deal with and quickly bounce back from - these extreme storm events.

In order to be as proactive as we can in preparing and protecting our residents, the Town of Bernardston is partnering with the Franklin Regional Council of Governments to prepare a Municipal Vulnerability Preparedness (MVP) Plan. This Plan will help us to:

- Understand connections between natural hazards and local and regional planning/mitigation efforts;
- Evaluate strengths and vulnerabilities of residents, infrastructure, and natural resources;
- Develop and prioritize resilient actions for the town, residents and our local organizations and businesses; and
- Identify actions that can reduce the impact of hazards and increase resilience, and later qualify us for funding to implement these important actions.

We previously planned on holding an in person workshop in late March to gather critical stakeholder feedback, but due to the ongoing COVID-19 pandemic we are now gathering information virtually. **We are hoping to conduct a brief phone interview with you in order to gain insight on what issues are most important to you;** we will call you within the next week to schedule an interview at a time that is convenient for you. We want the Plan to reflect the real needs and experiences of Bernardston residents, and your input is critical.

Please find enclosed an informational packet that provides an overview of the topics we will cover:

- Municipal Vulnerability Preparedness (MVP) Program
- Extreme Temperatures, Changes in Precipitation, and Extreme Weather Events Infographics (3)
- Guiding Interview Questions

By going through this planning process, the town will become "MVP certified" and then eligible for state-funded implementation grants to help us be prepared for the lasting effects of climate change. We are eager to hear what issues are important to you and what projects you think are most important for Bernardston to undertake. Your thoughts will help us to strengthen our climate resiliency plan and prioritize future projects.

We appreciate your time and we look forward to speaking with you.

Sincerely,

John Lepore, Bernardston Planning Board

Chris Wysk, Bernardston Planning Board

Kimberly Noake MacPhee, FRCOG

Allison Gage, FRCOG

PO Box 504; Bernardston, Massachusetts 01337

Phone: (413) 648-5401 Fax: (413) 648-9318

Email: bos@townofbernardston.org

Municipal Vulnerability Preparedness (MVP) Program

MVP Process Overview &

Key Takeaways from The Town of Bernardston's Hazard Mitigation Plan Update

Facilitated by the
Franklin Regional Council of Governments
A State Certified MVP Provider



Overview

Climate Change Impacts

Increased Temperatures

Increased Precipitation

More Extreme Weather

The Municipal Vulnerability Preparedness (MVP) grant program provides support for cities and towns in Massachusetts to begin the process of planning for climate change resiliency and implementing priority projects. Our community is already experiencing the effects of climate change, which raises the importance of this planning process.

Your feedback is critical to Bernardston's MVP Planning process!

Before your upcoming phone interview, consider the following questions:

- What hazards have impacted your community in the past?*
- What infrastructure/facilities are exposed to current and future hazards?*
- What are the strengths and vulnerabilities of your community?*
- What natural resources are important to your community?*



Photos courtesy of the Greenfield Recorder.

The Town of Bernardston's Top Priority Hazards

The Hazard Mitigation Committee identified and assessed relevant hazards for the Town of Bernardston. The Committee considered how different hazards have impacted the community, and how these impacts will become more severe due to climate change. Below is a snapshot of the Town's primary hazards, and examples of specific concerns related to high priority hazards.



Flooding

Bernardston's maps for the 100 and 500 year floodplain are critically out of date. Therefore, emergency personnel don't have accurate information about what areas in Town may be at risk of flooding. New maps need to be developed based on present and forecasted conditions.



Wildfire

The vast majority of Bernardston is forested, which makes it difficult for the Town and landowners to have a sense for the potential risk of forest fires. To better understand the potential risks and how this could increase with climate change, a GIS-based forest fire risk assessment is needed.



Extreme Temperatures

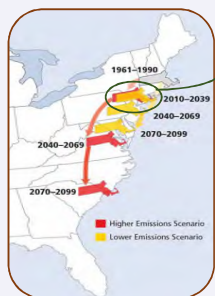
Changing climate has resulted in an annual decrease in days below freezing, a trend that will progress over the next century. Fewer days below freezing and deep frosts occurring later in the season are some of the contributing factors for larger tick and mosquito populations and longer seasons for both. This increases risk to Bernardston residents from insect borne diseases.

Extreme Temperatures



Current Conditions

Since the beginning of the century, temperatures in Massachusetts have increased almost 3 degrees Fahrenheit. Perhaps the most noticeable difference most of us have already recognized is that winter temperatures have risen approximately 4 degrees Fahrenheit.

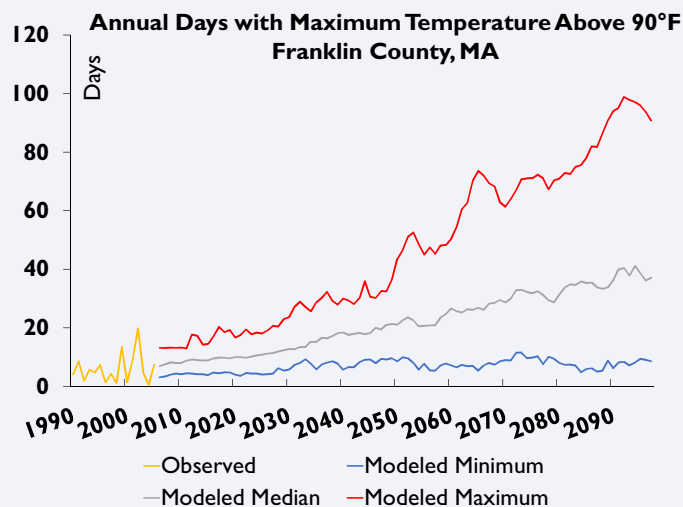


The map on the left shows how summer temperatures in Massachusetts may change through the end of the century. The circled region highlights where we currently are in the modeling scenarios.

Heavily forested Towns such as Bernardston may experience more wildfires in the near future due to **drier and hotter conditions**. To the right is an example of tree damage from a fire at the Charity Farm Lot.




Future Conditions



The number of days per year with daily maximum temperatures over 90°F is projected to **increase by 18 days by the 2050s, and by 32 days** by the end of the end of the century. Under a high emissions scenario, however, **there could be as many as 100 days** with a maximum temperature above 90°F by the end of the century.



Rising temperatures will undoubtedly have an impact on human health. Warmer climates allow populations of invasive pests such as ticks and mosquitoes to grow and live longer due to a delay of the first frost in the Fall. Additionally, an increase in the growing season means favorable habitats for these pests will expand. For example, ticks favor Japanese Barberry for nesting sites.


**Rising
Temperatures**


Wildfire

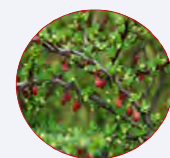

**Invasive
Species**

*How have these hazards
impacted your
community?*

*How do you think they
will change over time?*

Some of the potential impacts to our natural resources and habitats:

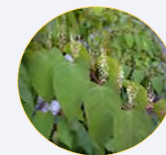
- Shift in seasons
- Mismatch of key food sources & wildlife
- Mismatch of bloom time & pollinators
- Drying of streams and wetlands
- Stresses on forest & ecosystem health
- Loss of ecological diversity



Japanese Barberry



Garlic Mustard



Japanese Knotweed

Many species of invasive plants that **threaten critical biological diversity** thrive in warmer temperatures. A total of nineteen invasive species have been identified in Bernardston.



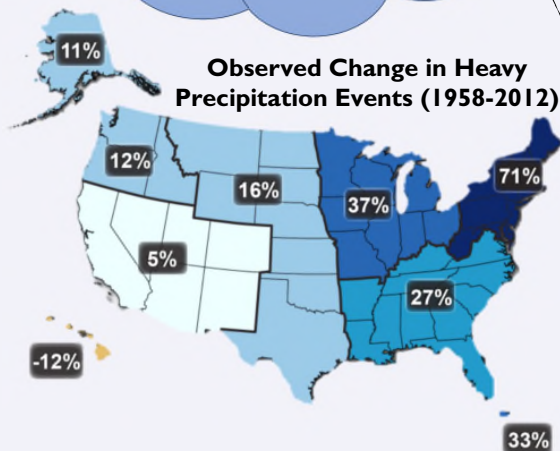
Information sourced from:
- 2020 Bernardston Hazard Mitigation Plan
- FRCOG's A Framework for Resilience
- ResilientMA: Climate Change Clearing House for the Commonwealth
Photos provided by John Lepore/Bernardston Planning Board

Changes in Precipitation

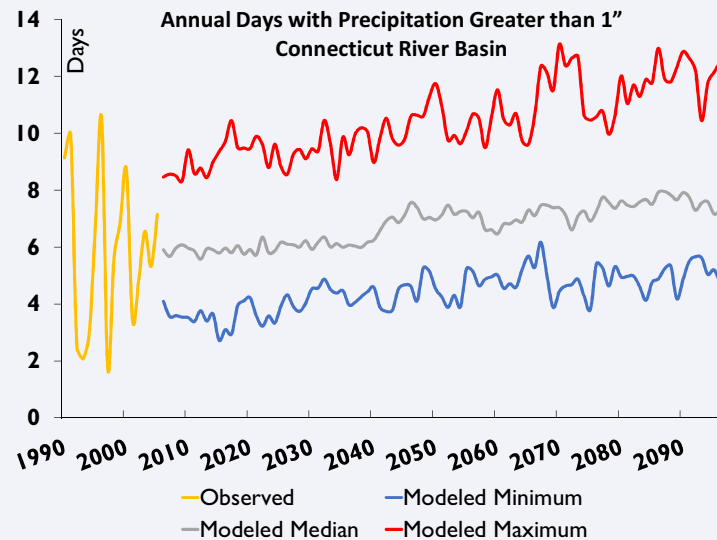
Annual precipitation in Massachusetts is projected to increase by as much as 7.3 inches by the end of this century

Current Conditions

The Northeast has seen a greater increase in extreme precipitation than any other part of the country, experiencing a **71% increase** in heavy precipitation events between 1958 and 2012.

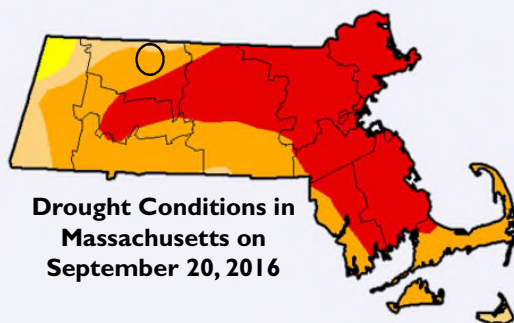


Future Conditions



By the end of the century, our area could have **5 additional days** of rainstorms that dump over 1 inch of rain.

What about Drought?

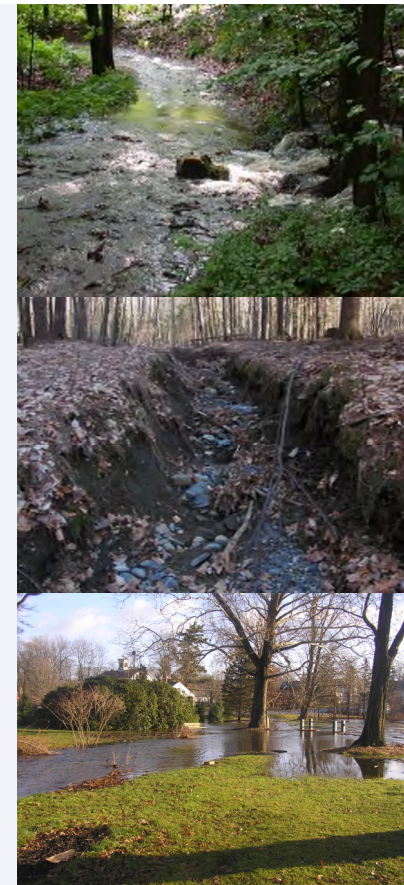


How have these hazards impacted your community?

How do you think they will change over time?

From March 2015 to May 2016, Massachusetts experienced a prolonged drought. By September 2016, the majority of Franklin County entered a "severe drought." The drought devastated many farms in the region.

Although Massachusetts will see an increase in precipitation, it will likely come in the form of winter rain. Massachusetts is expected to see a **75% increase in drought**.



The impacts of increased precipitation can be seen throughout Bernardston, from the Charity Farm lot to the Town Center. **What other natural or built features in Bernardston are affected by changes in precipitation?**

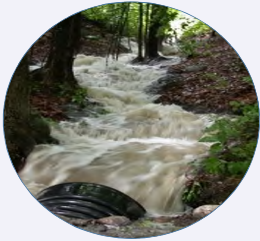
Information sourced from:
 - 2020 Bernardston Hazard Mitigation Plan
 - FRCOG's A Framework for Resilience
 - ResilientMA: Climate Change Clearing House for the Commonwealth

Photos provided by John Lepore/
 Bernardston Planning Board

Extreme Weather Events

Current Conditions

Below are some examples of recent extreme weather events that have affected Bernardston and surrounding communities in Franklin County.

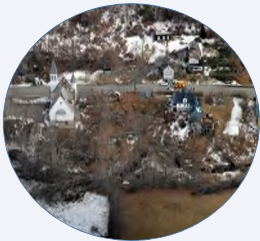


Flash flood events have recently occurred throughout Bernardston. One event of note was in 2006 when 9" of rain fell within 3 hours, leading to a foot of water on Route 10.

Photo courtesy of John Lepore/Bernardston Planning Board.

Pictured to the right is an example of the aftermath of a microburst that struck Orange in June of 2017. This storm included bouts of intense rain and hail, and caused thousands to lose power.

Photo courtesy of The Recorder.



In February 2017, an EF-1 tornado hit Conway. Wind speeds reached 110 mph, and the tornado severely damaged or destroyed several houses and buildings. The United Congregational Church (pictured on the left) was damaged beyond repair and was eventually demolished.

Photo courtesy of The Recorder.

The 2008 ice storm greatly impacted the Northeast. The ice downed numerous trees, branches, and power lines which resulted in wide spread power outages.

Photo courtesy of The Recorder.



Future Conditions

Extreme weather events are anticipated to increase due to climate change. Scientists predict the following factors will all **increase** over time:



Frequency



Intensity



Duration



Geographic extent

Example: A 2017 U.S. Climate Science Special Report noted that there has been an upward trend in North Atlantic hurricane activity since 1970. The report forecasts that future hurricanes formed in the North Atlantic will drop more rain and may have higher wind speeds. This is because a warmer atmosphere will hold more water, and hurricanes are efficient at wringing water out of the atmosphere and dumping it on land.



Hurricanes



Winter Storms



Tornadoes

How have these hazards impacted your community?

How do you think they will change over time?

Some of the potential impacts to our infrastructure and local economy:

- Destruction of property and infrastructure
- Disruption of critical services and transportation
- Crop loss
- Business interruption/economic disruption
- Dam damage/failure

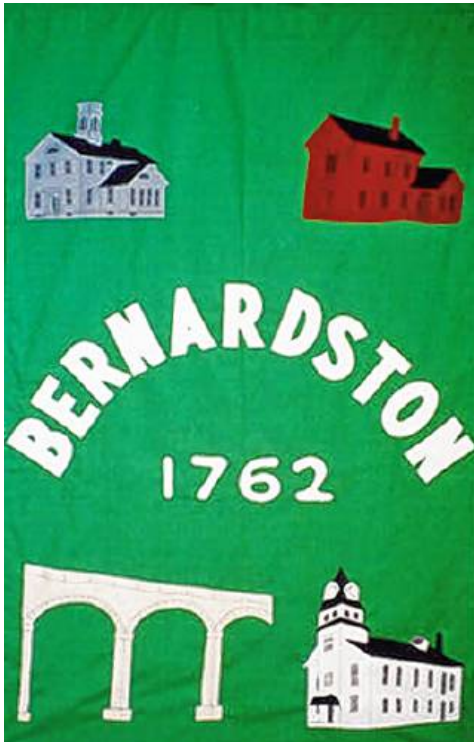
Information sourced from:
2020 Bernardston Hazard Mitigation Plan
FRCOG's A Framework for Resilience
ResilientMA: Climate Change Clearing House for the Commonwealth
Photos provided by John Lepore/Bernardston Planning Board

Goal for Building Resilience to a Changing Climate:

Protect life, property, natural resources and the economy

News > Local (</News/Local/>)

Bernardston collecting survey responses to inform vulnerability planning process



By [ZACK DeLUCA \(/byline?byline=By ZACK DeLUCA.\)](#)

Staff Writer

Published: 5/27/2020 1:37:41 PM

BERNARDSTON — After a planned eight-hour workshop was canceled in March, Bernardston's Municipal Vulnerability Preparedness (MVP) planning project is moving forward through the collection of community survey responses.

Related stories

\$20K grant to assess Bernardston areas impacted by climate change
(<https://www.recorder.com/bl-Bernardston-MVP-work-32624717>)

Bernardston, which was awarded a \$20,000 grant to support the creation of the plan, is one of several Franklin County municipalities researching and addressing local effects of climate change. Project Manager John Lepore said the plan is meant to address areas in town that could be affected by climate change.

“Some of these concerns include flooding in Center Village and beyond, threats of forest fires during droughts and loss of valuable biodiversity from exotic invasive species,” Lepore said.

The costs and impacts from climate-related issues remind towns of the need to increase their resiliency to effectively deal with and bounce back from extreme weather events. By working with the Franklin Regional Council of Governments (FRCOG), Bernardston will identify ways to reduce the impact of such hazards.

“The goal is to educate the public on how to prepare their homes, their land and their families for fires, floods or other natural disasters,” Lepore explained.

The \$20,000 grant funds a Community Resilience Workshop where businesses and community members are invited to share their concerns based on experiences and local scientific information. A draft of the plan is then developed and publicly presented during a Community Listening Session.

Finalizing the plan will then qualify Bernardston for further grants to complete projects identified in the process.

“In a perfect world, by now, the grant would be in its final stages,” Lepore said. “Needless to say, concerns over COVID-19 changed the process, and, like many other present-day situations, adjustments need to be made.”

As a result of the pandemic, the Massachusetts Executive Office of Energy and Environmental Affairs, which awarded Bernardston the \$20,000 grant, has extended the deadline for the planning process by one year. Instead of holding a Community Resilience Workshop at this time, the MVP Committee — consisting of FRCOG’s Kimberly Noake MacPhee and Allison Gage, Bernardston Planning Board Chair Christina Wysk and Lepore — has mailed out packets with local data and survey questions.

Lepore said the packets were sent to about 50 businesses, farmers, town departments and committees. Follow-up phone interviews are now underway. The data from these interviews will be compiled and summarized so it can later be presented during the Community Resilience Workshop.

According to Lepore, an official workshop will most likely be held early this fall. At this time, it is unclear whether it will be an in-person or virtual meeting. The same holds true for the required Community Listening Session.

Updates to the Municipal Vulnerability Preparedness plan will be added to the [Bernardston town website at townofbernardston.org](http://www.townofbernardston.org/index.php/bernardston-mvp-plan). (<http://www.townofbernardston.org/index.php/bernardston-mvp-plan>)

Zack DeLuca can be reached at zdeluca@recorder.com or 413-930-4579.

Related stories

\$20K grant to assess Bernardston areas impacted by climate change (<https://www.recorder.com/b1-Bernardston-MVP-work-32624717>)

https://www.berkshir mazda.com/new-vehicles/2021-mazda-cx-5-sport-awd?sd_campaign=Mazda_Tier2&sd_digadprov=geometry&sd_channel=video&sd_campaign_type=th

2021 MAZDA CX-5
Sport AWD

\$199 a month

36-month lease plus \$3,999 due at signing.
(10,000 miles/yr.) No security deposit required. Monthly payment includes \$650 acquisition fee. Excludes tax, title, license, and dealer options and charges.

Community Outreach – Interview Responses

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Rawen Fulton, Planning Board Member/Searchlight Films

Questions for Community Services

1. What type of service do you manage?
 - a. Community mental health
 - b. Assisted living
 - c. General community services
 - d. Medical services
 - e. Other
 - i. Searchlight Films, and Meadowedge Art for Children
 - ii. 46 Foxhill Road, abuts Fox Hill Brook
 1. Home is located uphill from Foxhill Brook, up right by the road, then slopes dramatically
 2. Sometimes starts flowing down Foxhill Brook and flood basement, during a January thaw in the middle of the winter. Snow on ice event, rainstorm event on top of that. Funneling down a path that he had shoveled, water went right down into the basement 1990s, destroyed computer equipment
 3. Have since built stone walls so that the land slopes away from the house and ditched the house – external drainage system
 4. Foxhill Brook is a big problem – floods Darwin Scott Swamp
2. Extreme weather events in recent years have affected your service in recent years
 - a. Not at all
 - b. Somewhat
 - c. Moderate
 - d. Frequent
 - i. Flooding, powerline outages, all the regular suspects
 - e. Extreme
3. Which hazards have interrupted your service in recent years?
 - a. Flooding
 - i. Mostly the Center of Town
 - ii. Jim ? wrote a history of Bernardston – stone bridge on River Road near the railway, built in the 1840s by an engineer. No cement, perfectly cut stone blocks. Amtrak goes over it twice a day + freight trains.
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Other
 - i. Anything that interferes with the internet and electricity – those are essential for businesses
4. Which aspects of your business are the most vulnerable to hazards?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- a. Treatment plans
 - b. Access to clients
 - c. Infrastructure
 - i. Makes videos – if internet is down he can't make videos and can't access clients
 - d. Other (please detail)
5. Are you aware of how extreme weather or changes in climate could impact your services?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future?
 - b. Moving target – this changes all the time. Involves game time decisions, incident by incident.
6. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
 - i. Had a fire in 2005 – rebuilt in 2007. Has a strong foundation, strong concrete slabs.
 - ii. Basement drainage – we're in good shape, but the Town should still be taking steps.
 - iii. Problems with drainage from Fox Hill Brook coming under the road.
7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
 - b. Not planning on taking any steps
8. What resources would be the most beneficial to you?
 - a. Information on funding
 - i. Funding for septic system for homeowners and businesses that need that
 - ii. Information about new types of septic systems/find out about alternative options
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
 - i. Not particularly relevant to his business.
9. Have you previously engaged your clients in issues relate to climate change or resiliency?
 - a. If yes, what was your approach?
 - i. Yes – a guy came over to the planning board with plans for something – planning board is good at helping people properly organize the way they present their land issues. Service that the planning board is happy to provide. In terms of his local business, he thinks it would be great to get more solar energy going around.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

ii. Neighbor has been approached to do a large solar farm up on West Mountain – many can't see it because it's behind trees on a flat top and no one lives there so it seems like an ideal location.

b. If not, has your organization considered conducting outreach?

10. What could the Town do to support your continued success?

As climate change progresses – we're going to have to adapt. I think when sea level rises three more feet, we're going to have an influx of environmental refugees. He has made several movies on the topic of rising population + environment. 50% of the population of the United States lives on the coast – where will they go when coastal towns are flooded? We don't currently have the social infrastructure to handle that crisis.

Overall very grateful to live in Bernardston.

11. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

River Maple Farm - Regina

Questions for Agricultural Stakeholders

1. What agricultural products does your farm support? (Detail types of crops and livestock)
 - a. Primarily a dairy farm – dairy cows, raise a few beef steers every year (sell by the quarter friends and family)
 - b. Grow hay and corn for the cows
 - c. Have a maple sugaring operation
 - d. Have started a cut flower garden
2. Which hazards have caused the most damage in recent years?
 - a. Flooding
 - i. There is a river that runs through the property that causes some flooding – maple operation is next to it but the river is small enough that does not cause a lot of damage
 - b. Drought
 - i. Biggest thing in recent years was 2016 – lost a lot of corn, which meant losing a season's worth of feed for the cows.
 - c. Extreme Temperatures
 - d. Invasive Species
3. Extreme weather events in recent years have affected my long-term farm/agricultural/forestry management goals
 - a. Not at all
 - b. Somewhat
 - c. Moderate
 - i. Having a severe drought is devastating on feed
 - ii. Fortunately this does not happen every year
 - d. Frequent
 - e. Extreme
4. What are your primary concerns or considerations related to the impacts of recent hazards in Bernardston?
 - a. Losing feed due to drought – very expensive to feed cows without the supply of corn.
5. How have your farming operations been affected by climate related hazards?
 - a. How often have climate related hazards disturbed your operations?
 - b. Not very often – extreme droughts are the biggest problem and the last time that happened was in 2016.
6. Which aspects of your farm are the most vulnerable to hazards? (Specific crops, livestock, etc.)
 - a. Feeding operations

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

7. What steps (if any) are you taking to safeguard your farming operations against the effects of climate change? (e.g. crop variety diversification, shifting planting/harvesting dates, water conservation and reuse programs)
- If yes, what hazard was the adaptation in response to?
 - Father is trying to plant a patch of sorghum this year, which is drought resistant and can be used to feed the dairy cows

8. Are there any steps you are planning to take?
- If yes, do you project any barriers to implement the changes?

Need more education – they don't know what would be most helpful to combat the effects of climate change. The farm has reached out to NRCS (Natural Resource Conservation Service) – supposed to come out this summer and assess the farm for different programs they may have available (general environmental and conservation programs). The evaluation will likely focus on water runoff and conservation efforts. Nutrient management is also included in the evaluation.

9. The following is a list of some weather challenges the farms and orchards in the Northeast have experienced. When you think about the impact they have had on your own farm or orchard, how concerned are you about these challenges? (Rank challenges 1-4, 1 being no concern and 4 being highly concerned)
- More frequent saturated soils and ponded water
 - More frequent river flooding events
 - More frequent flash flooding
 - More frequent erosion
 - Loss of nutrients due to heavy and abundant precipitation
 - Land is fairly dry – not too much moisture. Some parts of the field that are affected, but it's not widespread. They are lucky on that front. A lot of pasture land is on a hillside so they may lose nutrients from that. They have to fertilize a lot of that. The land where corn is grown is fairly flat.
 - More frequent crop diseases related to weather
 - Longer dry periods or drought
 - More frequent heat stress on crops
 - More frequent or new pest pressures related to weather (e.g. insects, fungus, disease)
 - Some leaf hoppers – only insect they've had. They've had some fields that are taken over by Japanese knotweed. Just been mowing and pulling it. It seems to be spreading along the riverbank (Fall River)
 - More frequent or new weed/invasive pressure related to weather
 - More frequent stress/runtime on cold storage/refrigeration due to increased temperatures
 - Sell all products through Cabot Cooperative so refrigeration isn't an issue
 - Reduced winter snow cover
 - More frequent unpredictable seasonal temperatures (early bud break, early or late frosts)
 - Wind damage
 - Hail and ice storm damage

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

10. Which of the following have the largest impacts on your success?

- a. Land use regulations, such as zoning
- b. Labor regulations
- c. Food safety regulations
- d. Pest control
- e. Extreme and variable weather
- f. Market volatility
 - i. Milk prices are pretty up and down – don't stay up for a while. All of the items on this list are important, but of all this one has the biggest impact.
- g. Crop failure
- h. Insecure land tenure
- i. Local tax structure
- j. Equipment purchasing or maintenance
- k. Increased operation costs
- l. Cost of mitigation (irrigation, row covers, increased use of pesticides, etc.)
- m. Labor shortages
- n. Other (please specify)

11. Which hazards are you most concerned about worsening in the future?

- a. Flooding
- b. Drought
 - i. Only one that they have been impacted from so far, so this is what we're most concerned about. They lost pretty much everything Fall 2016 and had to buy feed.
- c. Extreme Temperatures
- d. Invasive Species
- e. Other

12. What could the Town do to support your continued success?

- a. Education – what could the farm do? That's the biggest thing for them. Mentioned that when she went over the packet with her parents who run the farm they are definitely concerned but also unsure about how climate change will specifically affect them in the long run.

13. Are there any non-climate related vulnerabilities you would like to address?

- a. The markets are always a concern, but not much can be done about that – out of the Town's/their hands.

14. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Questions for Agricultural Stakeholders

1. What agricultural products does your farm support? (Detail types of crops and livestock)

Pasture raised pork, horse powered logging (sells lumber)

2. What are your primary concerns or considerations related to the impacts of recent hazards in Bernardston?

3. Extreme weather events in recent years have affected my long-term farm/agricultural/forestry management goals

- a. Not at all
- b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

4. How have your farming operations been affected by climate related hazards?

- a. How often have climate related hazards disturbed your operations?

Pork aspect of the business – pork and logging is tied to commodity markets, and that's tied very much into global weather, tied into all sorts of other things. Heat has been hard on the pigs, variability is also really hard (heavy rain + then drought) it's been super sporadic, very stressful, especially on the pigs

5. Which aspects of your farm are the most vulnerable to hazards? (Specific crops, livestock, etc.)

Livestock is the most vulnerable

6. What steps (if any) are you taking to safeguard your farming operations against the effects of climate change? (e.g. crop variety diversification, shifting planting/harvesting dates, water conservation and reuse programs)

- a. If yes, what hazard was the adaptation in response to?

Sort of – yes – complicated: recently bought the farm, bought it 2 years ago, building out infrastructure, building structures for pigs in the transition months – if pigs were out in pasture in April that would be bad for the land. Covered buildings with deep bedding

7. Are there any steps you are planning to take?

- a. If yes, do you project any barriers to implement the changes?

8. Which hazards have caused the most damage in recent years?

- a. Flooding
- b. Drought
- c. Extreme Temperatures

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- d. Invasive Species
 - e. Other
9. The following is a list of some weather challenges the farms and orchards in the Northeast have experienced. When you think about the impact they have had on your own farm or orchard, how concerned are you about these challenges? (Rank challenges 1-4, 1 being no concern and 4 being highly concerned)
- a. More frequent saturated soils and ponded water
 - b. More frequent river flooding events
 - c. More frequent flash flooding
 - d. More frequent erosion
 - i. Has not been a problem but is definitely a concern with pigs on exposed soil, when those weather events happen, more rain it'll become more of an issue
 - e. Loss of nutrients due to heavy and abundant precipitation
 - f. More frequent crop diseases related to weather
 - g. Longer dry periods or drought
 - h. More frequent heat stress on crops
 - i. Days above 95 degrees, pigs don't gain weight. Every day weight gain is really important
 - i. More frequent or new pest pressures related to weather (e.g. insects, fungus, disease)
 - j. More frequent or new weed/invasive pressure related to weather
 - k. More frequent stress/runtime on cold storage/refrigeration due to increased temperatures
 - l. Reduced winter snow cover
 - m. More frequent unpredictable seasonal temperatures (early bud break, early or late frosts)
 - n. Wind damage
 - o. Hail and ice storm damage
10. Which of the following have the largest impacts on your success?
- a. Land use regulations, such as zoning
 - i. Definitely hard to navigate – on conservation land, the CR is held by the Franklin Land Trust, they are great but the type of CR prevents him from getting grants. If APR would be eligible for much more money
 - b. Labor regulations
 - c. Food safety regulations
 - d. Pest control
 - e. Extreme and variable weather
 - f. Market volatility
 - g. Crop failure
 - h. Insecure land tenure
 - i. Local tax structure
 - j. Equipment purchasing or maintenance
 - k. Increased operation costs
 - l. Cost of mitigation (irrigation, row covers, increased use of pesticides, etc.)
 - m. Labor shortages
 - n. Other (please specify)

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

11. Which hazards are you most concerned about worsening in the future?

a. Flooding

b. Drought

c. Extreme Temperatures

d. Invasive Species

i. They are there and problematic and the pressure is there – will be interesting to see what happens in 10 years. Runs pigs on the edges of fields multiflora rose and bittersweet. Can look into grants for thus

e. Other

12. What could the Town do to support your continued success?

Awareness of linking – a lot of programs out there – in a small way just facilitating pointing people in the right direction. Help with grants and could be helping. Hard to find what is out there.

13. Are there any non-climate related vulnerabilities you would like to address?

Market volatility

14. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Val Deane – Stoney B Acres

Questions for Agricultural Stakeholders

1. What agricultural products does your farm support? (Detail types of crops and livestock)

Horses and hay

2. What are your primary concerns or considerations related to the impacts of recent hazards in Bernardston?
3. Extreme weather events in recent years have affected my long-term farm/agricultural/forestry management goals
- Not at all
 - Somewhat
 - Moderate
 - Frequent
 - Extreme

Always something going on, wind shear came through and took down ½ an acre of pine timber and had to get a bulldozer to fix the damage.

4. How have your farming operations been affected by climate related hazards?
- How often have climate related hazards disturbed your operations?

With hay, you want it to be wetter – keeps the pastures better for the horses. Drought cut the first crop.

5. Which aspects of your farm are the most vulnerable to hazards? (Specific crops, livestock, etc.)

Hay is vulnerable if there's a drought. They haven't had many issues. Winter is winter and summer is summer. You just work the weather as a farmer

Have solar on the barn, produces power. Does more for the farm. Can sell it – covers half of the barn.

Ticks are a huge problem now. Guinea hens fowl – spray the horses on a regular basis. Makes vet bills high, high fevers, lethargy, have to put horses on doxy

More ice, horses now have ice shoes

Don't mind the liquid – but without snow they can do a lot better

6. What steps (if any) are you taking to safeguard your farming operations against the effects of climate change? (e.g. crop variety diversification, shifting planting/harvesting dates, water conservation and reuse programs)
- If yes, what hazard was the adaptation in response to?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
8. Which hazards have caused the most damage in recent years?
 - a. Flooding
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Other
9. The following is a list of some weather challenges the farms and orchards in the Northeast have experienced. When you think about the impact they have had on your own farm or orchard, how concerned are you about these challenges? (Rank challenges 1-4, 1 being no concern and 4 being highly concerned)
 - a. More frequent saturated soils and ponded water
 - b. More frequent river flooding events
 - c. More frequent flash flooding
 - d. More frequent erosion
 - e. Loss of nutrients due to heavy and abundant precipitation
 - f. More frequent crop diseases related to weather
 - g. Longer dry periods or drought
 - h. More frequent heat stress on crops
 - i. More frequent or new pest pressures related to weather (e.g. insects, fungus, disease)
 - j. More frequent or new weed/invasive pressure related to weather
 - k. More frequent stress/runtime on cold storage/refrigeration due to increased temperatures
 - l. Reduced winter snow cover
 - m. More frequent unpredictable seasonal temperatures (early bud break, early or late frosts)
 - n. Wind damage
 - o. Hail and ice storm damage

Weeds have been a problem – fertilize crops and has to be careful with what she sprays.

Fungus on the broadleaf and clover – from a load of Hay from Canada

Done well with eradicating.

Yellow straw (?) seen all over Town – hasn't seen it much this year though. No help to the animals. Bed straw is another thing that (white flower, doesn't hurt the horses but no nutrients)

10. Which of the following have the largest impacts on your success?
 - a. Land use regulations, such as zoning
 - b. Labor regulations
 - c. Food safety regulations
 - d. Pest control
 - e. Extreme and variable weather
 - f. Market volatility

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- g. Crop failure
- h. Insecure land tenure
- i. Local tax structure
- j. Equipment purchasing or maintenance
- k. Increased operation costs
- l. Cost of mitigation (irrigation, row covers, increased use of pesticides, etc.)
- m. Labor shortages
- n. Other (please specify)

11. Which hazards are you most concerned about worsening in the future?

- a. Flooding
- b. Drought
- c. Extreme Temperatures
- d. Invasive Species
- e. Other

Ice and lightning – has blown out the water pump and electric fencer.

12. What could the Town do to support your continued success?

N/A

13. Are there any non-climate related vulnerabilities you would like to address?

COVID, decreasing sign ups in 4H

14. Any other information you would like to provide?

Would like to do something with wind power

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Sweet Lucy's Bakeshop

Questions for Small Businesses

1. What sector is your business in?
 - a. Retail
 - b. Infrastructure
 - c. Real estate
 - d. Information/technology
 - e. Service
 - f. Other
2. Which hazards have caused the most damage in recent years?
 - a. Flooding
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Severe wind/microbursts
 - i. Any storm that affects power is a great concern – can quickly lead to food and product spoilage. It also decreases foot traffic to the bakeshop/interrupts deliveries etc.
 - f. Other
3. Extreme weather events in recent years have affected my long-term business management goals
 - a. Not at all
 - b. Somewhat
 - i. Hasn't been greatly impacted, but is concerned about the future because the shop doesn't have backup power. Generators are also expensive.
 - c. Moderate
 - d. Frequent
 - e. Extreme
4. Which aspects of your business are the most vulnerable to hazards?
 - a. Direct damage to property
 - b. Food spoilage
 - c. Delays in delivery
 - d. Loss of customers
 - e. Other (please describe)
5. Are you aware of how extreme weather or changes in climate could impact your business?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

6. What steps (if any) are you taking to safeguard your business against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
 - i. None taken yet – but is interested in learning more about what other business owners in Town are doing. For example, she knows one owner has solar on their restaurant and would like to know what she could do to be better prepared and limit interruptions to her business.
7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
8. What resources would be the most beneficial to you?
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
9. What could the Town do to support your continued success?

10. Any other information you would like to provide?

Is interested in learning more about the Town's efforts surrounding climate resiliency, and was excited to hear that Bernardston is proactively trying to address these issues.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Mark Abramson MVP Interview - May 30, 2020

1. Sheep, laying hens, meat birds, hay, grow own fruit and vegetables
2. 70 to 100 acres
3. Flood in CV; Need sewerage treatment for commercial development; excess water coming into CV; ones property with a very high water table and is very concerned about septic failure
4. Somewhat: Barton Brook over ran its banks and had excessive erosion and tree collapses along banking; water access is also an issue, although they have a new shallow well that seem to be working sufficiently.
5. Hay production is low from dry or excessively wet years; their pastures and sheep are effected
6. Hay production; forest - woolly adelgid killing eastern hemlock
7. Not much; just the shallow well
8. Funding to re-route Barton Brook; they plan to put conservation easement on their land fund bank restoration.
9. 1. Flooding fo brook, 2. Drought, 3. Invasive species
10.
 - a. 2
 - b. 4
 - c. 4
 - d. 4
 - e. 2
 - f. 2
 - g. 3
 - h. 2
 - i. 2
 - j. 1
 - k. 1
 - l. 2
 - m. 2
 - n. 2
 - o. 2
11.
 - a. 1
 - b. 1
 - c. 1
 - d. 2
 - e. 3
 - f. 1
 - g. 3
 - h. 1
 - i. 1
 - j. 1
 - k. 1
 - l. 2
 - m. 1
12.
 - a. 4
 - b. 4
 - c. 4
 - d. 2
13. MVP Strategic plan, Master Plan

14. Barton Brook - needs to be protected as part of the town's water district protection zone
15. No

Spoke with Clayton, owner of Antonio's II pizza.

Questions for Small Businesses

1. What sector is your business in?

- a. Retail
- b. Infrastructure
- c. Real estate
- d. Information/technology
- e. Service
- f. Other

2. Extreme weather events in recent years have affected my long-term business management goals

- a. Not at all
- b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme
- f. *Allow option for respondents to provide additional information*

3. Which hazards have caused the most damage in recent years? (*Ranked question*)

- a. Flooding
- b. Drought
- c. Extreme Temperatures
- d. Invasive Species
- e. Severe wind/microbursts
- f. Other

g. Owner stated none

The owner discussed the current ongoing situation with COVID-19 as an example of how they continue to operate despite bad conditions. When the outbreak first happened, they closed the Greenfield shop, started forwarding calls, offered free delivery (75% of their business is takeout anyway), and greatly increased advertising. Clayton mentioned that if a natural hazard were to occur, they would continue to "wing it" and figure out what to do depending on the situation.

4. Which aspects of your business are the most vulnerable to hazards? (*Ranked question, with N/A*)

- a. Direct damage to property
- b. Food spoilage
- c. Delays in delivery
- d. Loss of customers
- e. Other (please describe)

The owner mentioned that with any storm, losing power is his biggest concern. However, they are on the same circuit as the fire station, so over a span of 15 years they have only lost power once for 24

hours.

5. Are you aware of how extreme weather or changes in climate could impact your business?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future?
6. What steps (if any) are you taking to safeguard your business against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?

The owner mentioned that he is aware that to safeguard his business against many of these hazards, he could buy a backup generator, but realizes that it is not worth sinking in \$5,000 to have it any only use it a couple of times. His biggest concern is with regard to the sewer lines in Town, and is an advocate of connecting his service to the City of Greenfield, or the Town doing something using an RDA grant. He did express concern over severe flooding impairing septic systems throughout Town, and that is something he would be excited to see the Town work on. Otherwise, he thinks the Town does a really good job making repairs, etc.

7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
8. What resources would be the most beneficial to you? (*Leave open ended, or provide examples*)
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
9. What could the Town do to support your continued success?

10. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Bernardston Fire Department

Questions for Community Services

1. What type of service do you manage?
 - a. Community mental health
 - b. Assisted living
 - c. General community services XX
 - d. Medical services XX
 - e. Other XX Fire / emergency service
2. Extreme weather events in recent years have affected your service in recent years
 - a. Not at all
 - b. Somewhat
 - c. Moderate
 - d. Frequent XXXXXX
 - e. Extreme
3. Which hazards have interrupted your service in recent years?
 - a. Flooding XX
 - b. Drought XX
 - c. Extreme Temperatures XX
 - d. Invasive Species
 - e. Other XX Storms are stronger
4. Which aspects of your business are the most vulnerable to hazards?
 - a. Treatment plans
 - b. Access to clients XX
 - c. Infrastructure XX
 - d. Other (please detail)
5. Are you aware of how extreme weather or changes in climate could impact your services?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future? Yes
6. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken. **Tried to get a new station for over 15 years**
 - b. If yes, what hazard was the adaptation in response to?
7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

8. What resources would be the most beneficial to you?
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
9. Have you previously engaged your clients in issues relate to climate change or resiliency?
 - a. If yes, what was your approach?
 - b. If not, has your organization considered conducting outreach?
10. What could the Town do to support your continued success?
- 11. Any other information you would like to provide?**

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Questions for Bernardston Fire & Water District (Bill Pachalis, Chair)

1. What sector is your business in?
 - a. Retail
 - b. Infrastructure PWS and fire suppression $\frac{3}{4}$ of town serviced # 1475 people; 668 serve connections of North on Rte 5 to Old Hollywood. To the East Bob Cooke excavating to the South to the district meeting house; West just to west of Rte 5. Aging infrastructure. Some original equip 1930's plus new stuff in 2019. 1-2 Improvement projects every year consistently to slowly rebuild infrastructure. System financed customers based on usage. Plus Fire & Water tax rate the Assessors help with this. 87 and 88 feet deep. Picking up Sodium.
 - c. Real estate
 - d. Information/technology
 - e. Service
 - f. Other
2. How have Extreme weather events in recent years have affected short-term and long-term management/operations?
 - a. Not at all
 - b. Somewhat
 - c. Moderate
 - d. Frequent
 - e. Extreme
 - f. **Allow option for respondents to provide additional information** Power outages. 2 pump houses only 1 has a standby generator. Flooding hasn't been a problem yet, but it could cause loss of water main. Moderate to high impacts. Reduced capacity by $\frac{1}{2}$. River could overtake/erode well house/well. Salt is a huge problem and impacts water quality. 450 gallons/minute. Town just went to all salt. And water district just wrote a letter. Killing trees, etc. I-91 and Rte 5 are MassDOT. Sodium levels are increasing over time. Impacts to the health of the elderly potentially. Sampling done not in winter, when application rates are high. Have asked for low/no salt zones. No response. Fosters.com re: road salt article
3. Which hazards have caused the most damage in recent years? (*Ranked question*)
 - a. Flooding
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Severe wind/microbursts
 - f. Other Power outages due to storm events #1. Lightning strikes fry water pumps. Naturally attracts
4. Which aspects of the system/infrastructure are the most vulnerable to hazards? (*Ranked question, with N/A*)
 - a. Direct damage to property

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- b. Food spoilage
 - c. Delays in delivery
 - d. Loss of customers
 - e. Other (please describe)
 - road salt corrodes water mains cuz they are on the edge of the road.
 - f. 2 buried tanks. Screened vents. Water could breach and enter. Animals. District has emergency response plans that covers all this. Updated once/year. Any requirements for natural hazards/change. Guidance manual. This is a strength. But could use more guidance... see #5
 - g. Operator job posted for 5 years no applicants. Lack of volunteers to serve on Board, etc.
 - h. Succession plan needed. Older board members, etc. no one stepping up.
 - i. Can't raise rates money is not there.....
 - j. Storm damages can bust budgets – how can the District make a damage account? Can create articles and can fund them. Can do without affecting tax rate.
 - k. Boil water advisory \$20K account based on previous experience – strength
 - l. Storm damage account could be established. Most trees are not the responsibility of the power company. Access roads to water tanks lined with trees. Well in north end of town and pump house
 - m. Solar field on property that the District owns. Went online April 2020. No battery storage. On credit plan. Grant money through MassDEP and incentives through power company. Can fully power both well stations/power house. Surplus is generated and thinking of giving back to fire dept and town hall....still talking about that. Get battery storage for backup during storm event.
5. Are you aware of how extreme weather or changes in climate could impact the F&W District?
- a. Do you feel that you have adequate information on how your business could be impacted in the future? He would like more info. Doesn't feel like he has adequate info.... Commissioners/town folks need more info. Public education/ town officials need this and then the residents.
6. What steps (if any) are you taking to safeguard your business against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
- a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
 - c. Installation of back up power is critical. \$30K
7. Are there any steps you are planning to take?
- a. If yes, do you project any barriers to implement the changes? Money#1 Regulatory Agencies #2 and poor planning #3. Need coordination between sewer & water departments, DPW, opening road to elementary school lay a new main. Worked together. More coordination among parties.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

8. What resources would be the most beneficial to you? *(Leave open ended, or provide examples)*
- a. Information on funding **yes** grants are too hard to fill out forms/admin hurdles...all in same boat. TA needs
 - b. A workshop on how to prepare/enhance protection **yes, very important, Operator CEC credits. Very important and sought after. New topics welcome.....** include town admins too.
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks. Operator trainings are time to network. Part-time/side job.....don't have time to go to meetings on personal time.
9. What could the Town do to support your continued success? Great SB, level-headed, good relationship with the town. Interact with FDept. Continually. Continue the good communication, good relationship.

10. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Bernardston Water Department

Questions for Community Services

1. What type of service do you manage?
 - a. Community mental health
 - b. Assisted living
 - c. General community services
 - d. Medical services
 - e. Other
2. Extreme weather events in recent years have affected your service in recent years
 - a. Not at all
 - b. Somewhat
 - c. Moderate
 - d. Frequent
 - e. Extreme
 - f. ***Allow option for respondents to provide additional information***
3. Which hazards have interrupted your service in recent years? (***Ranked question***)
 - a. Flooding
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Other

Ground temperature gets warmer, and there are problems with algae. In the late summer/fall there are a lot of problems with bacteria in the water. Some years are warmer than others.

4. Which aspects of your business are the most vulnerable to hazards? (***Ranked question, with N/A***)
 - a. Treatment plans
 - b. Access to clients
 - c. Infrastructure
 - d. Other (please detail)

Troubles with the winter storm that knocked out the power, and they didn't have power to pump for a while. Reservoirs will last a while with normal use, but they got down to critical levels. Once the power came back on

They do now have backup generators.

Not sure if they have had to use them recently.

Test the water every year, test the water twice a year. Laboratory, were checked for lead and copper. Test it at least once a year. Places in the water system where the state comes and takes samples of the

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

water.

5. Are you aware of how extreme weather or changes in climate could impact your services?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future?
6. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?

Drought is usually what causes problems. Bernardston's aquifer where they draw the water out. One of them is shared by Greenfield. Once of them years ago, saw that Brook dried right up. 10am-11am, different people said that is when water use spikes.

The other well is up on Brattleboro Road near 91 and Route 5. Near the River Maple Farm. They have two systems in Bernardston where they are separate, can open a valve when the two systems run together.

Town does have a backup surface water supply. They have to set in every month or so of records of how much water they use to MassDEP, how much water gets pumped, how much gets leaked out of the system. Can't exceed a certain amount of water pumped and water billed out as your system gets older.

8. What resources would be the most beneficial to you? (*Leave open ended, or provide examples*)
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
9. Have you previously engaged your clients in issues relate to climate change or resiliency?
 - a. If yes, what was your approach?
 - b. If not, has your organization considered conducting outreach?
10. What could the Town do to support your continued success?

Upgrading the system, water pipes may break during winter storms.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

He mentioned during his time with the Highway Department, when they would try to fix culverts, it was a frustrating process. Ex. to replace a small failed culvert you would have to contact a soil scientist etc. and surrounding residents may have

11. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Hayley Bolton, Director of the Bernardston Council on Aging

Questions for Community Services

1. What type of service do you manage?
 - a. Community mental health
 - b. Assisted living
 - c. General community services
 - d. Medical services
 - e. Other
 - i. Council on aging, responses reflect the needs of clients.
2. Extreme weather events in recent years have affected your service in recent years
 - a. Not at all
 - b. Somewhat
 - i. Flooding has affected clients, the majority of seniors are on a fixed income it's hard to make repairs when needed. Concerned that there will be a need for more repairs due to increased flooding.
 - c. Moderate
 - d. Frequent
 - e. Extreme
3. Which hazards have interrupted your service in recent years?
 - a. Flooding
 - b. Drought
 - c. Extreme Temperatures
 - i. Noted this is the greatest concern.
 - ii. Some of the seniors don't have air conditioning in the summer months, or in the winter months the cost of oil is too high and then they are reluctant to turn on the heat. Both of these instances can create a dangerous situation.
 - iii. Asked about if they have current programs to help with this situation – the COA currently has an outreach worker who can facilitate between seniors and Community Action
 - d. Invasive Species
 - e. Other
4. Which aspects of your business are the most vulnerable to hazards?
 - a. Treatment plans
 - b. Access to clients
 - i. Checking in on clients during a hazard is a concern – the internet in Bernardston is not reliable so they rely on in person communications. This becomes more difficult during a storm.
 - c. Infrastructure
 - d. Other (please detail)

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- i.
5. Are you aware of how extreme weather or changes in climate could impact your services?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future?
6. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
 - i. On hot days, the COA invites people to come in so they don't have to be at home without air conditioning.
 - ii. The COA works closely with emergency services, and they do referrals to local agencies to help seniors with various needs.
7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
 - i. Yes – the COA is interested in doing more outreach. However, the success of outreach might depend on how open minded people are. Then, there are other circumstances where people might be vulnerable but not in a position to take action.
8. What resources would be the most beneficial to you?
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
 - i. As a council, resources on different state programs that they could refer seniors to
 - ii. Or information on how climate change will impact others
9. Have you previously engaged your clients in issues relate to climate change or resiliency?
 - a. If yes, what was your approach?
 - b. If not, has your organization considered conducting outreach?
 - i. No, no formal outreach. Thinking of doing this in the future – and they could model after COVID response.
10. What could the Town do to support your continued success?
 - a. Start with more information, the director has been in the position for a year and would like to know if there are programs that could help seniors that they could refer them out to

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- i. Note: would be great to get them involved with the AARC grant/make sure we provide outreach materials and information about the website when we have it. We (FRCOG) are interested in doing targeted outreach for seniors.

11. Any other information you would like to provide?

Extreme temperatures are of great concern – and can have a critical impact on seniors. Beyond what was mentioned above, hot temperatures can also impact their breathing and have other health consequences. However, in terms of heating issues it is a difficult issue to solve because seniors still have to pay increasing bills on a fixed income.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Questions for Agricultural Stakeholders

1. What agricultural products does your farm support? (Detail types of crops and livestock)

In the meat business, raise sheep. Selling lambs, some hay.

2. What are your primary concerns or considerations related to the impacts of recent hazards in Bernardston?

3. Extreme weather events in recent years have affected my long-term farm/agricultural/forestry management goals

- a. Not at all
- b. Somewhat
- c. Moderate
- d. Frequent
- e. Extreme

Anyone who is dealing with the weather is affected a lot.

Two that pop out – extreme weather during lambing. Lambs in the winter – get a blast when it's 15 below zero they lose lambs. This time of the year they are thinking more about drought – that affects the hay crop.

If you have an extremely dry period and then get warm rains, you get a huge parasite hatch. Roundworm. Sheep have not been affected by lyme. More trouble with internal parasites.

4. How have your farming operations been affected by climate related hazards?

- a. How often have climate related hazards disturbed your operations?

5. Which aspects of your farm are the most vulnerable to hazards? (Specific crops, livestock, etc.)

His cropland and pasture, went through the extreme dry period this year. Went through an extremely wet period 2 years ago because it rained everyday. Mother nature will always have its extremes, and we end up on the losing side.

6. What steps (if any) are you taking to safeguard your farming operations against the effects of climate change? (e.g. crop variety diversification, shifting planting/harvesting dates, water conservation and reuse programs)

- a. If yes, what hazard was the adaptation in response to?

They more have to roll with it – nothing is ever all good or all bad.

7. Are there any steps you are planning to take?

- a. If yes, do you project any barriers to implement the changes?

8. Which hazards have caused the most damage in recent years?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- a. Flooding
 - b. Drought
 - c. Extreme Temperatures
 - i. Extreme events – going from extremely dry to extremely wet. Going from thunderstorms that have 8 inches of rain to nothing. Lambing in the winter – sheep do quite well in moderately cold, dry conditions. Have extreme back and forth events (45 and drizzling to 5 below with 20mph wind). Whipsaw events are not good.
 - d. Invasive Species
 - e. Other
9. The following is a list of some weather challenges the farms and orchards in the Northeast have experienced. When you think about the impact they have had on your own farm or orchard, how concerned are you about these challenges? (Rank challenges 1-4, 1 being no concern and 4 being highly concerned)
- a. More frequent saturated soils and ponded water
 - b. More frequent river flooding events
 - c. More frequent flash flooding
 - d. More frequent erosion
 - e. Loss of nutrients due to heavy and abundant precipitation
 - f. More frequent crop diseases related to weather
 - g. Longer dry periods or drought
 - h. More frequent heat stress on crops
 - i. More frequent or new pest pressures related to weather (e.g. insects, fungus, disease)
 - j. More frequent or new weed/invasive pressure related to weather
 - k. More frequent stress/runtime on cold storage/refrigeration due to increased temperatures
 - l. Reduced winter snow cover
 - m. More frequent unpredictable seasonal temperatures (early bud break, early or late frosts)
 - n. Wind damage
 - o. Hail and ice storm damage
10. Which of the following have the largest impacts on your success?
- a. Land use regulations, such as zoning
 - b. Labor regulations
 - c. Food safety regulations
 - d. Pest control
 - e. Extreme and variable weather
 - f. Market volatility
 - g. Crop failure
 - h. Insecure land tenure
 - i. Local tax structure
 - j. Equipment purchasing or maintenance
 - k. Increased operation costs
 - l. Cost of mitigation (irrigation, row covers, increased use of pesticides, etc.)
 - m. Labor shortages

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- n. Other (please specify)
 - i. Trend towards buying local is helpful – COVID-19, roundabout way people are thinking even more about buying local.
 - ii. Run a small operation and don't have economies of scale – if it's commodity ag he can't compete. Local folks are willing to pay a small premium to get it local and from someone they know

11. Which hazards are you most concerned about worsening in the future?

- a. Flooding
- b. Drought
- c. Extreme Temperatures
- d. Invasive Species
- e. Other
 - i. Extreme weather – we're fortunate living in New England – we don't have 8 year droughts like in Australia. If we start getting events like those we are going to get put out of biz.

12. What could the Town do to support your continued success?

Not really. Most of the things they could do they are already doing – right to farm legislation is helpful. Taxing as current use instead of development taxes.

13. Are there any non-climate related vulnerabilities you would like to address?

Market – if the market turns away again from buying local, small farmers can't compete. We rely very heavily on the marketplace. Probably a bigger impact than the weather for their operation. IF no one wants to buy it's compost.

14. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Questions for Small Businesses

1. Owner of the Four Leaf Restaurant – Paul S. (currently the property manager)
 - a. Family has owned the restaurant since the 40s
 - b. General comment: a solar farm was supposed to go up in the back of the restaurant and had been approved. He has some concern about water running off the mountain in extreme conditions/increased precipitation.
2. What sector is your business in?
 - a. Retail
 - b. Infrastructure
 - c. Real estate
 - d. Information/technology
 - e. Service
 - f. Other
 - i. Restaurant. No longer runs the restaurant, has leased it to the people who currently own it for the last 18 years. Still involved with property management his family has owned the restaurant for a long time.
3. Which hazards have caused the most damage in recent years?
 - a. Flooding
 - i. Has always been a problem at the restaurant since he was a kid, but it has only gotten worse. The park floods now. Has already seen changes. At one time Scott Swamp used to be farmed, and wasn't wet – at some point in the history had ditches (currently ditches along South Street to drain water off the mountain) but those have all been abandoned. Without those ditches there – everything is filling in. When you have water coming off the mountain it flood and backs up into the brook and into the center of town. That's the main problem and it's slowly getting worse. There's a simple solution – but wetlands protection act blocks simple solutions. He isn't sure how the Town will get around that. Need to figure out how to mitigate water levels. At the restaurant – can dig down three feet down in the spring during a wet season and find water. Have to have above ground septic system at the restaurant. Also get water in the cellar in the house behind the restaurant.
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Severe wind/microbursts
 - f. Other
4. Extreme weather events in recent years have affected my long-term business management goals
 - a. Not at all
 - b. Somewhat

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- c. Moderate – if the septic system fails then that will put them out of business. In that case, he would say extreme.
 - d. Frequent
 - e. Extreme
- 5. Which aspects of your business are the most vulnerable to hazards?
 - a. Direct damage to property
 - b. Food spoilage
 - c. Delays in delivery
 - d. Loss of customers
 - e. Other (please describe)
- 6. Are you aware of how extreme weather or changes in climate could impact your business?
 - a. Do you feel that you have adequate information on how your business could be impacted in the future?
- 7. What steps (if any) are you taking to safeguard your business against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
 - i. No – flooding is really the only issue. The house used to have a drainage system in the cellar and was running into a brook. Have to pump the house – it would be nice to put in a drainage system but they don't own the land behind it. Not much they can do about it.
- 8. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
- 9. What resources would be the most beneficial to you?
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
 - i. Resources – doesn't know what the Town could do for them - it's a major geographical issue that has to be dealt with by the state. Something is going to have to be done, the park now has an underground drainage system so they might do something with that. Will help get the water flowing out of the brook and the park won't flood. How do we find a compromise between keeping the town center alive and not damaging the environment? That's how it all washes out. That is going to have to happen to try to mitigate the issue.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

10. What could the Town do to support your continued success?

11. Any other information you would like to provide?

Reiterated that somehow there is going to have to be a compromise with the wetlands protection act – otherwise the town will fail. Businesses already do not want to come in and if flooding damage persists the businesses that are already there will face serious issues. Not cost effective to put in an entire sewer system if there is the possibility of a simple solution (referring to better drainage in town center that would technically violate the WPA).

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Heirloom Collective – Jim

Questions for Small Businesses

1. What sector is your business in?

- a. Retail
- b. Infrastructure
- c. Real estate
- d. Information/technology
- e. Service
- f. **Other**

Medical cannabis grow facility is located in Bernardston.

2. Extreme weather events in recent years have affected my long-term business management goals

- a. Not at all
- b. **Somewhat**
- c. Moderate
- d. Frequent
- e. Extreme
- f. ***Allow option for respondents to provide additional information***

3. Which hazards have caused the most damage in recent years? (***Ranked question***)

- a. Flooding
- b. Drought
- c. **Extreme Temperatures**
- d. Invasive Species
- e. Severe wind/microbursts
- f. **Other**

The company hasn't been hit by any major storms yet. However, extreme temperatures are a great concern. Cannabis is a finicky/difficult plant to grow, so extreme temperatures can have a direct impact on the plant. The facility is carefully operated to maintain an optimal temperature, so at this point it mostly impacts operational costs.

Jim mentioned that although they haven't had any damage, himself and the other owners are greatly concerned about the potential impact of storms – made reference to the tornado warning that was put out in late May. After what happened in Springfield and Conway, he knows that it's a possibility. All of the cofounders live near Boston and Jim mentioned it's nerve wracking to be 2.5 hours away from the facility when there are reports about big storms in western Massachusetts.

The building itself is an open steel building – due to the way it's constructed it can cause a natural wind tunnel.

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

4. Which aspects of your business are the most vulnerable to hazards? (*Ranked question, with N/A*)

- a. Direct damage to property, and the product
- b. Food spoilage
- c. Delays in delivery
- d. Loss of customers
- e. Other (please describe)

The facility in Bernardston doesn't rely on vendors – direct damage to their property/crops is of greatest concern. Although no damage to the facility yet, more severe storms do impact operational costs.

As a business they are starting to develop phase 2 expansion – they are anticipating more issues with environmental impact, but are trying to figure out how to decrease impacts.

5. Are you aware of how extreme weather or changes in climate could impact your business?

- a. Do you feel that you have adequate information on how your business could be impacted in the future?

6. What steps (if any) are you taking to safeguard your business against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)

- a. If yes, please describe the actions taken.
- b. If yes, what hazard was the adaptation in response to?

The owners are definitely thinking about implementing solar power – they currently have a backup generator but it runs on propane. It has been part of the plan for a bit; the roof is engineered/properly cited for the installation of solar panels. However, the ongoing pandemic is shifting their schedule in terms of when they will be able to complete the building expansion and add solar. They already recapture water runoff for reuse.

They have also fenced in all of the external facilities, which can create some drift during snowstorms.

Also use LED lights for energy efficiency.

7. Are there any steps you are planning to take?

- a. If yes, do you project any barriers to implement the changes?

8. What resources would be the most beneficial to you? (*Leave open ended, or provide examples*)

- a. Information on funding
- b. A workshop on how to prepare/enhance protection
- c. Detailed region/sector impacts
- d. Contact details for state or city officials
- e. Details on how future climate changes will impact my business
- f. A network of other small businesses in the area who face similar risks

9. What could the Town do to support your continued success?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

A better understanding of the floodplain in Town would be helpful to them to better plan for how they may be impacted by a flood event.

10. Any other information you would like to provide?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

Peter Nai – Bernardston Selectboard

Questions for Community Services

1. What type of service do you manage?
 - a. Community mental health
 - b. Assisted living
 - c. General community services
 - d. Medical services
 - e. Other
2. Extreme weather events in recent years have affected your service in recent years
 - a. Not at all
 - b. Somewhat
 - c. Moderate
 - i. Flooding – didn't get a lot the past year but have in the past
 - d. Frequent
 - e. Extreme
3. Which hazards have interrupted your service in recent years?
 - a. Flooding
 - i. Especially in the center village
 - ii. Risk is high moving forward
 - b. Drought
 - c. Extreme Temperatures
 - d. Invasive Species
 - e. Other
 - i. Wildfire – the town hasn't dealt with this yet but this is a large risk moving forward
 - ii. West Mountain Road is vulnerable (northern part of town in general)
 - iii. It's a large town for so few people – wildfire could carry great risk
4. Which aspects of your business are the most vulnerable to hazards?
 - a. Treatment plans
 - b. Access to clients
 - c. Infrastructure
 - i. Center village is vulnerable to flooding – and there are some homes in the area, which is the biggest concern to him in terms of infrastructure
 - d. Other (please detail)
 - i. Center Village readily comes to mind
 - ii. A few dirt roads that are heavily impacted (frequently washed out and then repaired, a fairly frequent process) – Fox Hill Road
 - iii. Regularly in trouble in April when mud season gets dangerous
5. Are you aware of how extreme weather or changes in climate could impact your services?

Bernardston Municipal Vulnerability Preparedness – Outreach Guiding Questions

- a. Do you feel that you have adequate information on how your business could be impacted in the future?
6. What steps (if any) are you taking to safeguard your services against severe weather hazards? Some examples include developing an emergency plan, installing hurricane windows, basement drainage, partnering with other local businesses)
 - a. If yes, please describe the actions taken.
 - b. If yes, what hazard was the adaptation in response to?
 - i. Yes this grant is a big step – we really aren't ready for future hazards
7. Are there any steps you are planning to take?
 - a. If yes, do you project any barriers to implement the changes?
8. What resources would be the most beneficial to you?
 - a. Information on funding
 - b. A workshop on how to prepare/enhance protection
 - c. Detailed region/sector impacts
 - d. Contact details for state or city officials
 - e. Details on how future climate changes will impact my business
 - f. A network of other small businesses in the area who face similar risks
 - i. Have a fairly elderly population – I worry about the families that are relying on electric power for medical conditions – number is between 10 and 15, if there is a problem with a grid we're not ready for what could happen there. Our police department is fairly stretched – only 1 or 2 officers on the road for a large town. We need a lot more preparedness that they should be looking at. Been in town for 20 years and hasn't seen any correspondence addressing this issue.
9. Have you previously engaged your clients in issues relate to climate change or resiliency?
 - a. If yes, what was your approach?
 - b. If not, has your organization considered conducting outreach?
10. What could the Town do to support your continued success?
 - a. Greatest concern: who knows what's going to happen going forward with finances – how do finances and emergency preparedness go together? What happens if the money runs out? How does the town move forward? Where will the cutbacks come from?
11. **Any other information you would like to provide?**

We're looking a lot at solar and vegetation around solar sites, as that grows, how do we ensure that we're not using glyosphosphate and keeping invasives down, what's the agreements to get that done. Solar is coming to Town – landfill and one off of Route 5 that has been approved. Client has 3 years to start the project. Have invasives been written into the agreement? When landfill is done, that'll be front and center in the discussion.

Please save the date and come to our
MVP COMMUNITY RESILIENCE BUILDING WORKSHOP

Join via zoom on Tuesday, September 15th
11am – 1pm

Please join us for a public workshop to discuss your experiences with climate related threats, such as flooding, severe winter storms, and extreme temperatures. Your thoughts will help to strengthen our climate resiliency plan.

This workshop is a part of Bernardston's effort to become a designated MVP Community. During the workshop we will:

- ✓ Review the natural hazards impacting Bernardston and how climate change is interacting with these hazards
- ✓ Discuss responses gathered from stakeholder outreach and further outline our strengths and vulnerabilities
- ✓ Brainstorm resiliency actions



WE NEED YOUR INPUT!

Access the workshop via zoom:

<https://us02web.zoom.us/j/84169348858?pwd=bDN0ekxLQ1JFNWVTdDlMTGJBNGdYdz09>

Access the workshop via phone:

1-929-436-2866

Meeting ID: 841 6934 8858

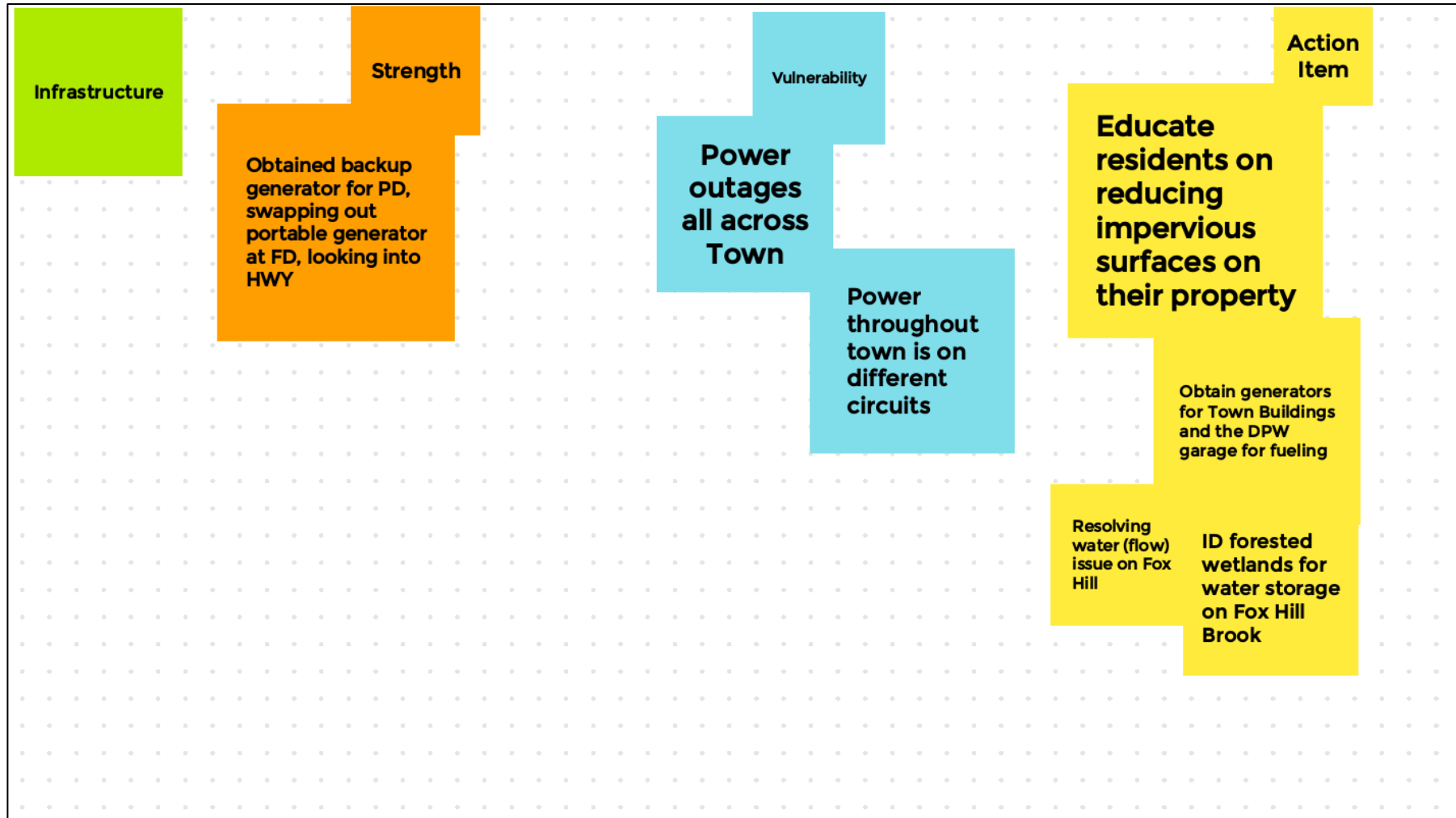
Passcode: 257523

Please RSVP to confirm attendance:

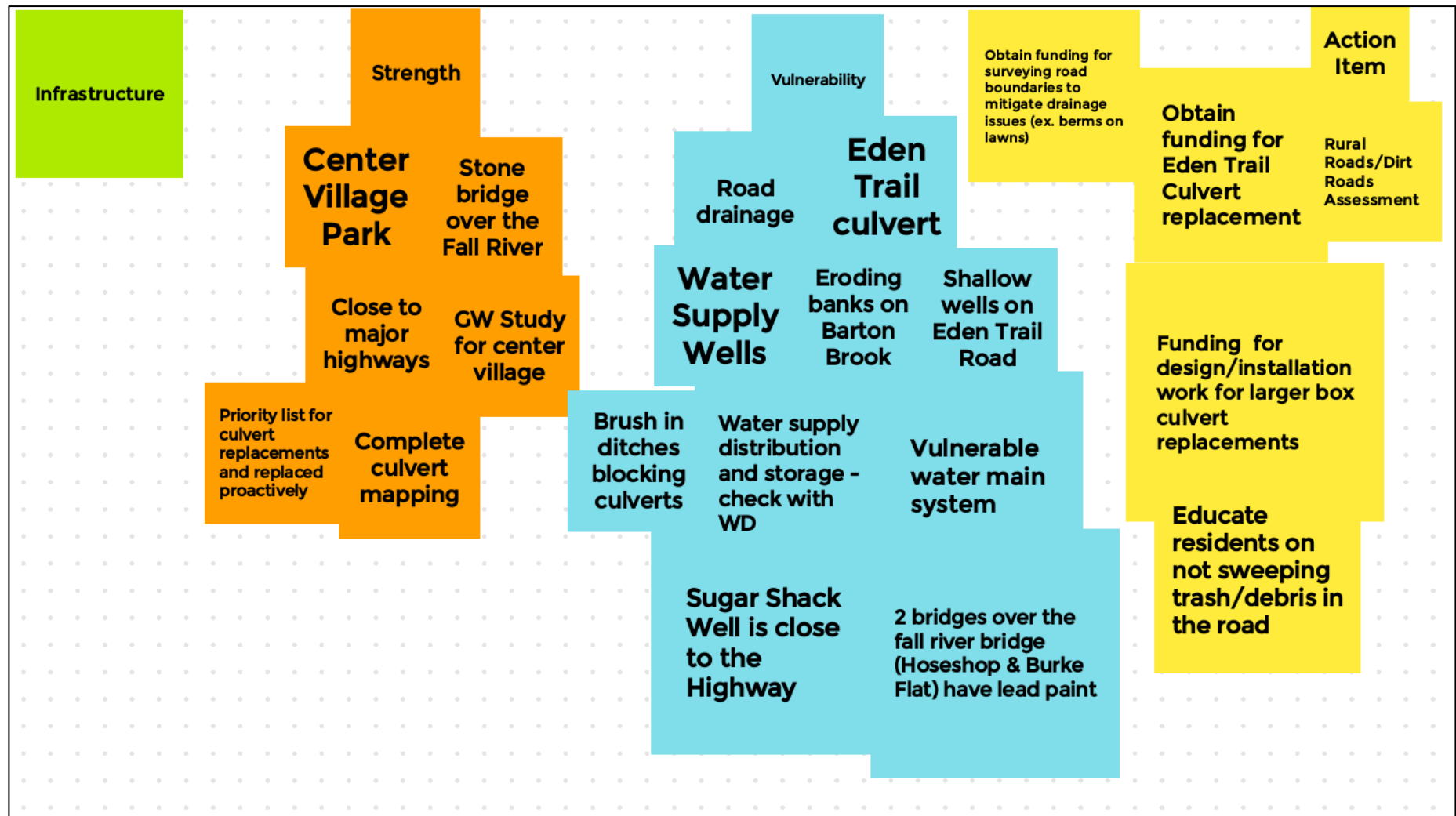
Louis Bordeaux, Town Coordinator
bos@townofbernardston.org or 413-648-5401

EXERCISE OUTPUTS

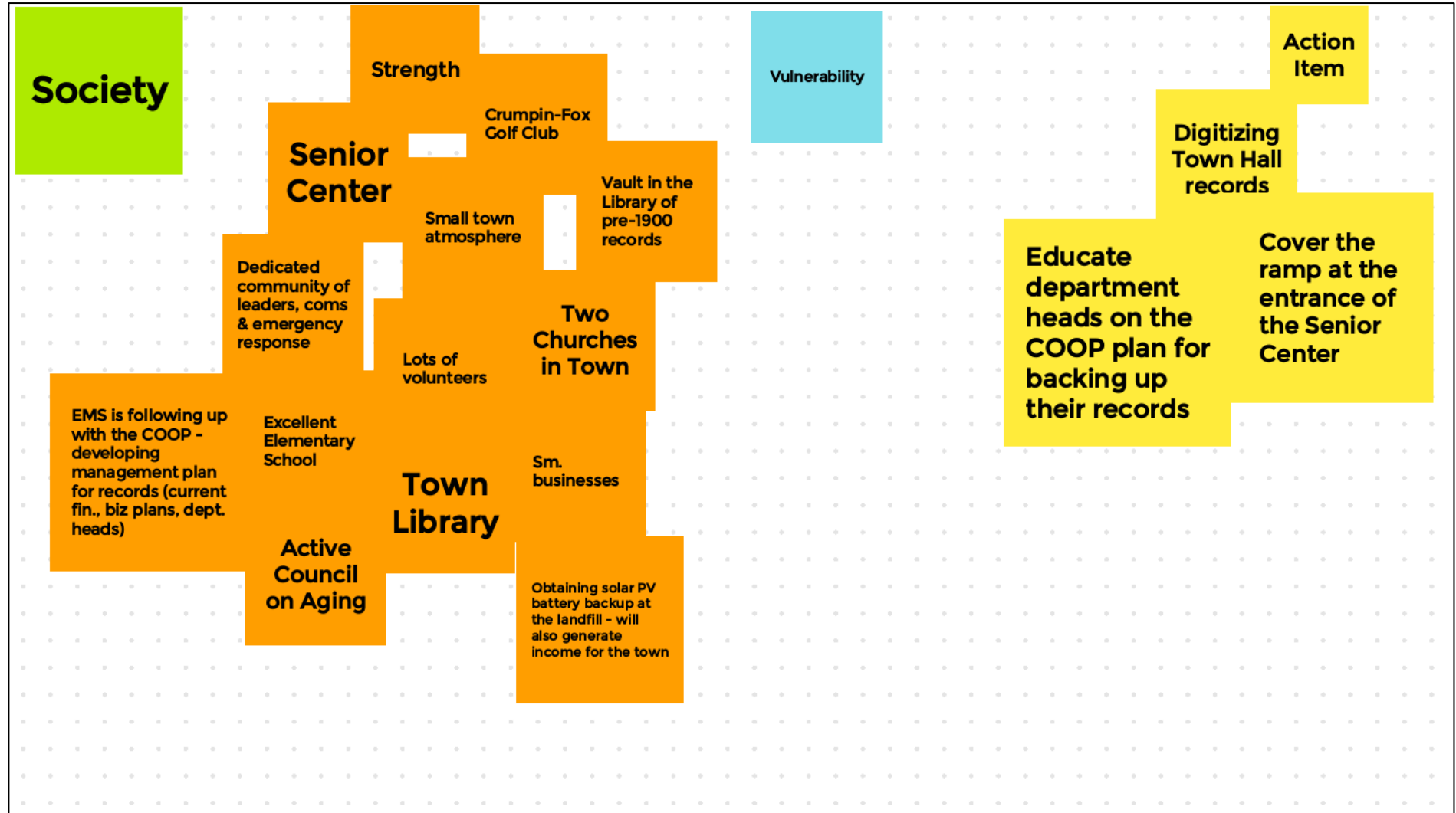
Strengths/Vulnerabilities/Action Items – Infrastructure #1



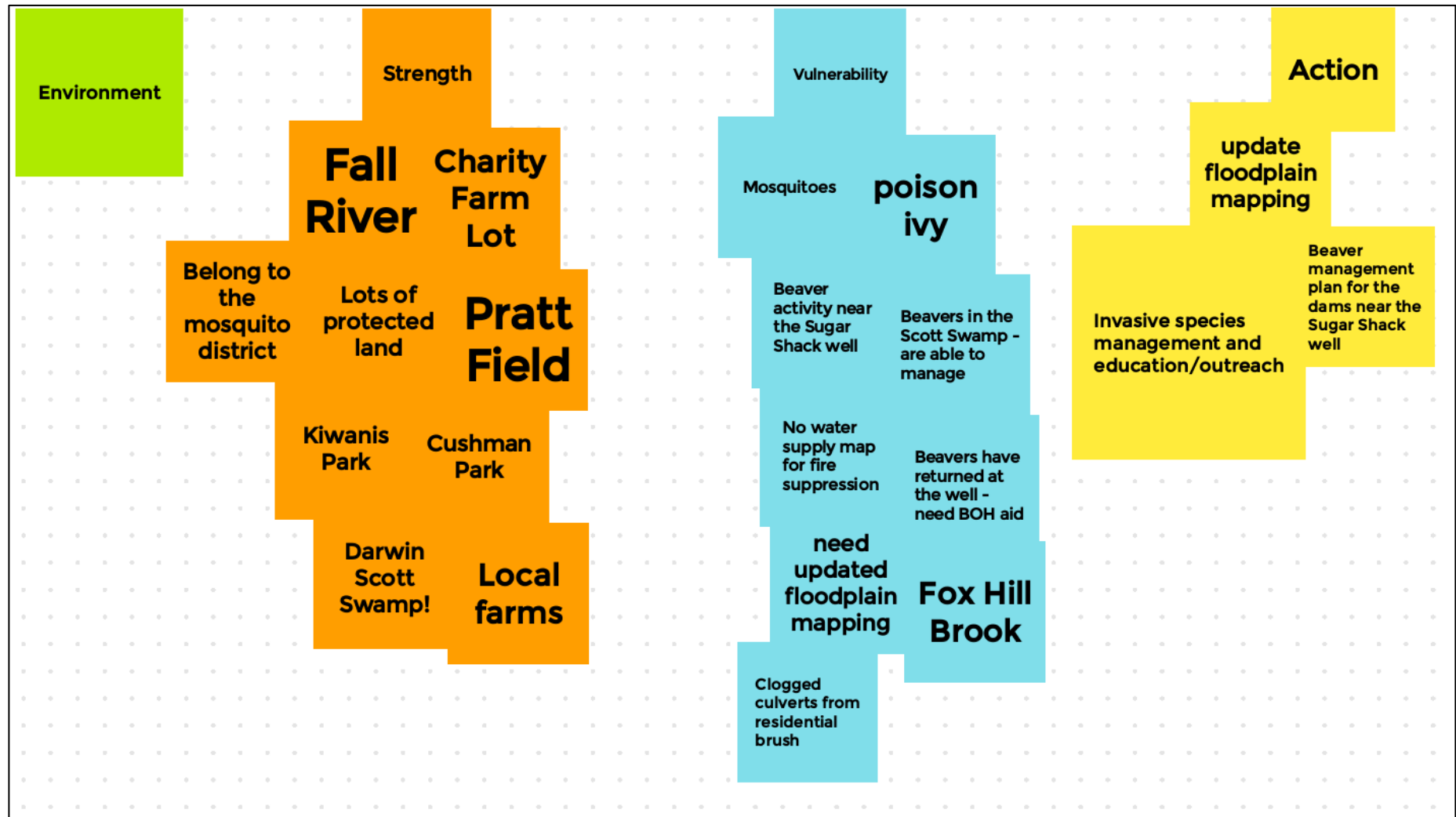
Strengths/Vulnerabilities/Action Items - Infrastructure #2



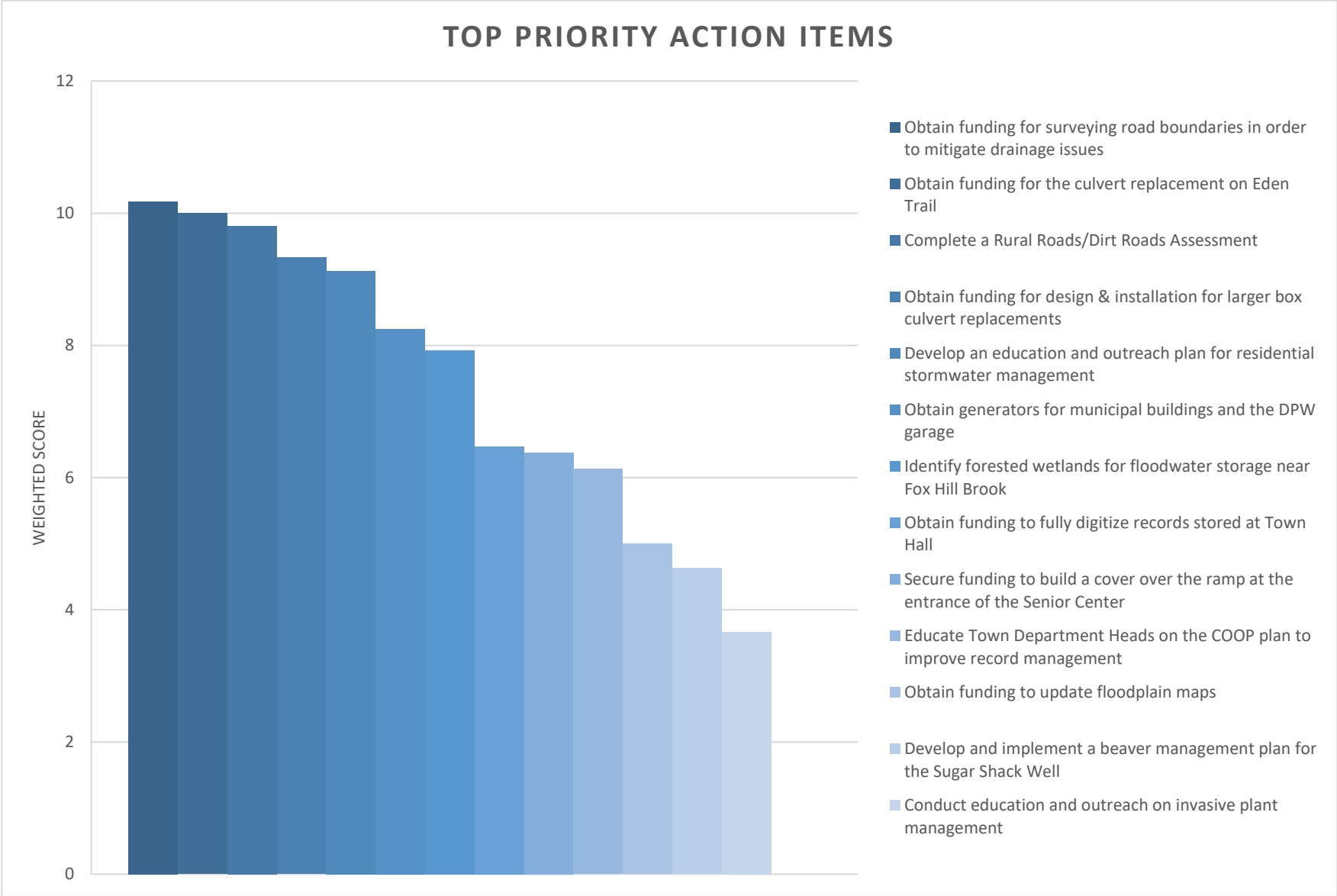
Strengths/Vulnerabilities/Action Items - Society



Strengths/Vulnerabilities/Action Items - Environment



Recommendation Prioritization



CRB Workshop Presentation

Community Resilience Building Workshop

Town of Bernardston

October 2020

Zoom Housekeeping

Unmute/mute yourself – please stay muted if not speaking


Ask questions/report issues

Turn on/off video function

Prevents videos from blocking presentation


MVP Designation

Montague




MVP Grant: \$33,750
Match Amount: \$11,250
Total Project Cost: \$45,000

Deerfield




MVP Grant: \$47,325
Match Amount: \$19,611
Total Project Cost: \$66,936

Montague City Road Flooding Protection Project: Design and Permitting






Culvert Redesign and Retrofit and Bylaw Update




Workshop Outcomes

Main goal: build resilience!

- Understand strengths and vulnerabilities in three sectors

Infrastructure Society Environment











- Actions to build on strengths and address vulnerabilities

Workshop Agenda

- Overview of the Municipal Vulnerability Preparedness (MVP) Program
- Review community outreach and top hazards
- Identify Strengths and Vulnerabilities and develop action items
- Discuss next steps

Participant Introductions

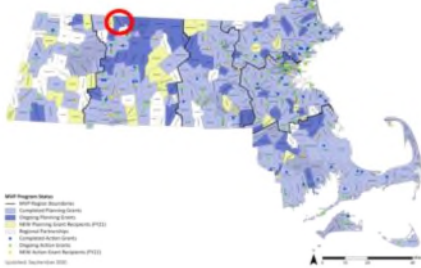





- Name
- Position/Department
- How have you/your community been impacted by natural hazards?
- What is your greatest concern?

Municipal Vulnerability Preparedness (MVP) Program

\$44 Million since 2017



Why the MVP program?

A climate resilient town will be able to maintain functions, protect its residents and emerge stronger and better prepared for future storm events and a changing climate.

The goal of building resilience is protect life, property, natural resources and the economy



Massachusetts' Changing Climate

Changing Weather



Changes in Precipitation



Rising Temperatures



Extreme Weather

Amplifies Existing Risks



Natural resources & habitat



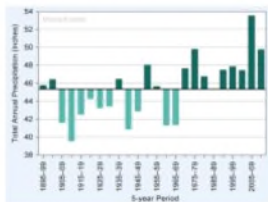
Human health & welfare



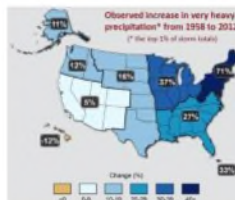
Local economy & infrastructure

Heavy Precipitation

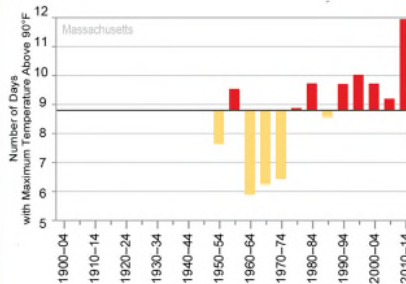
Observed Annual Precipitation



Observed Increase in Heavy Precipitation

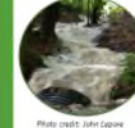


Higher Temperatures

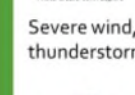


- Number of days >90° are predicted to increase.
- By 2050 - 6 to 25 more days
- By 2100 - 9 to 60 more days

Extreme Weather Events



Flash flooding, tropical storms



Severe wind, thunderstorms



Tornadoes



The frequency, intensity, duration and geographic extent of these extreme storms is likely to increase.

-



Wildfire

- Many west to south facing slopes, which increase vulnerability
- Limited access to water for firefighting
- Some areas are not easily accessible for fire fighting



Photo credits: The Greenfield Recorder



Severe Storms

- Residents and businesses lose power
- Crops on farms may be damaged
- Shelters don't have a backup power supply



Photo credits: The Greenfield Recorder

Project Tasks

• Complete MVP Workshop Activities

- ✦ Review Massachusetts' changing climate ★
- ✦ Identify top hazards ★
- ✦ Identify strengths and vulnerabilities
- ✦ Brainstorm resiliency projects



Workshop Process

1 Identify strengths and vulnerabilities



Infrastructure

Strength

- Trees near powerlines are routinely cut

Vulnerability

- Undersized culverts or bridges



Environment

- Large parcels of conserved land

- Culverts are blocked by beaver dams



Society

- Residential emergency preparedness

- Sheltering facility lacks backup power

Workshop Process

2 Brainstorm resiliency projects

Examples:

- Upgrade culverts, flood-proof drinking water supplies
- Evacuation drills and extreme weather communications protocols to protect vulnerable populations
- Protect wetlands and floodplains to improve flood resiliency

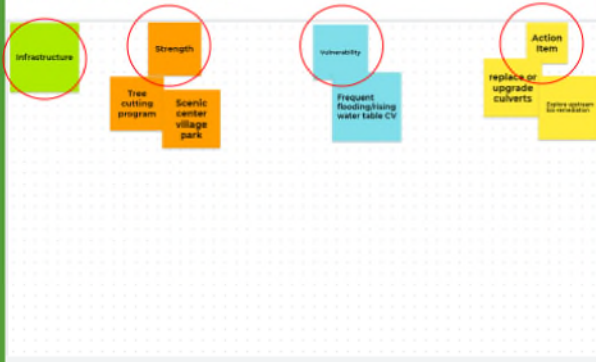


Photo credits: Mass DEP

Nature Based Solutions




Workshop Activity



Community Resilience Building Matrix

Information collected will be transposed into the matrix for the final MVP Plan

Community Resilience Building Risk Matrix  www.CommunityResilienceBuilding.com

1. Priority for action over the short or long term (and @rating)
 2. Vulnerability 3. Strength

Top Priority Hazards (roads, floods, wildfires, hurricanes, earthquakes, drought, sea level rise, heat wave, etc.)

Hazards	Location	Ownership	V or S	Priority	Rating
Infrastructure					
Social					

Vote on priority action items

Please **rank** all of the priority action items – link is in the chat

1. Please rank the action items

Rank by #

1	Culvert mapping
2	Upstream bio-remediation
3	Education and outreach on climate change
4	Obtain a generator for the shelter
5	Distribute tick collars to seniors with pets
6	Streambank stabilization

Done

Don't forget to submit!

Drag actions up and down

Bio Break!

Vote on priority action items

Please **rank** all of the priority action items – link is in the chat

Computer version



Mobile version



Project Tasks

•Complete MVP Workshop Activities

- ✦Review Massachusetts' changing climate
- ✦Identify top hazards
- ✦Identify strengths and vulnerabilities
- ✦Brainstorm resiliency projects



•Compile Information into a Summary Report



•Listening Session with Town Residents and Stakeholders

•Finalize MVP Report and Request MVP Designation

Public Comment Period

A public listening session and public comment period were held to provide Bernardston residents and Town Officials an opportunity to review and comment upon the draft Bernardston MVP Resiliency Plan.

The public listening session was held as a standalone meeting on January 14, 2021 at 6:30pm via zoom. FRCOG Staff and Planning Committee members presented the MVP program as well as findings from the workshop, provided opportunities for feedback on the Town's top resiliency actions, and answered questions from attendees.

Representatives from the Town's Select Board, Planning Board, and many residents were present at the meeting. Overall, the meeting attendees were happy with the plan and presentation.

Summary of comments from the January 14, 2021 Listening Session:

Participants were asked to introduce themselves and address their concerns about climate change and natural hazards and their impact on Bernardston. The following were mentioned:

- Concerns about the stability of the natural resources in Town and preserving the rural character of the Bernardston
- Storage of Town records, concerned about how vulnerable the records are. Records are not fire proofed or backed up.
- Tree die offs due to invasive species
- Forest fires, much of residential properties are in the wildland urban interface
- Drought and its impact on the Town's municipal water supply
- Drainage issues on Fox Hill Brook
- Rising groundwater table could impact septic systems in the Center Village
- A need for understanding the Town's right of ways (maintain and verify the Town's right of ways)
- Standing water throughout Town
- Drainage issues on gravel roads
- Road conditions after storms
- Maintaining open spaces to preserve water quality
- Increase efforts to protect the Town's tree canopy
- Encourage rain gardens on Town property to mitigate stormwater flow

Participants were later asked to comment on the Town's top vulnerabilities in each sector. The following were mentioned:

Infrastructure: Emergency access routes, flooding in the Center Village, power grid

Society: Food security, economic impacts

Environment: Water supply and water quality, loss of natural habitat due to invasive species

At the end of the session, participants brainstormed additional resiliency actions. The following ideas were proposed:

- Rainwater harvesting as an idea to address irrigation needs
- Look into regional solutions to increase food security
- Educate residents about the impacts of their own land use practices
- Watershed scale solutions to flooding on Fox Hill Brook, such as working with landowners to acquire property to reconnect the forested floodplain
- Educate residents on the importance of rainwater gardens and how their own practices impact stormwater runoff

The public comment period was held from January 14, 2021 to January 28, 2021, during which the public was invited to submit comments via email. All comments received during the listening session were incorporated into the plan.

The Bernardston Planning Board reviewed the plan and determined it should be updated to include action items related to the following topics:

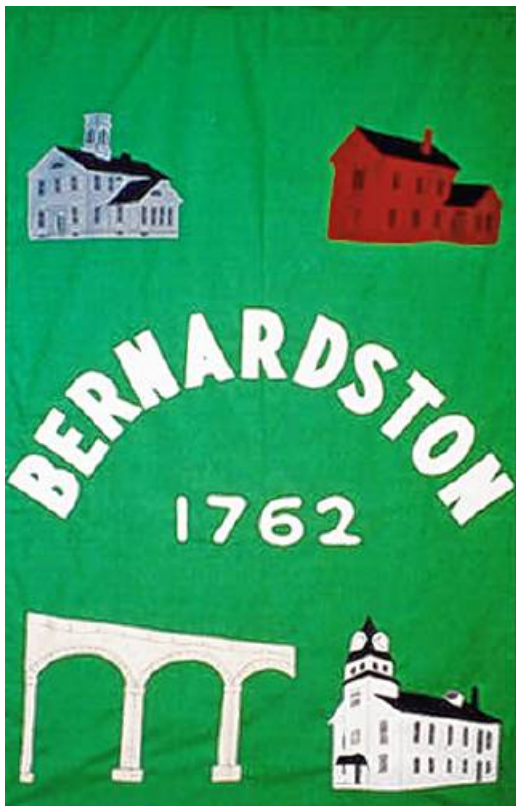
1. River corridor mapping and river corridor protection bylaws
2. Public engagement and social justice, with a focus on the elderly
3. Encouraging the development of pollinator habitat and resilient landscapes on municipal and residential property

FRCOG Staff and MVP Planning Committee members worked together to brainstorm and update the action plan to reflect those comments.

The public listening session and public comment period were advertised on the Town of Bernardston's website. The press release, shown below, was published in the Greenfield Recorder. Additionally, a flyer was distributed via pizza boxes to advertise the listening session. A recording of the listening session was posted on the Town website.

News > Local (/News/Local/)

Bernardston's vulnerability preparedness process wrapping up with Thursday meeting



By [ZACK DeLUCA \(/byline?byline=By ZACK DeLUCA\)](#)

Staff Writer

Published: 1/12/2021 3:03:58 PM

BERNARDSTON — To finalize the eligibility requirements necessary to be certified as a Municipal Vulnerability Preparedness (MVP) community, Bernardston is holding a community listening session Thursday at 6:30 p.m.

Planning Board member John Lepore said the purpose of the hour-long, virtual meeting will be twofold.

“We need community member input on additional climate change challenges, and to further refine the results from the list created at the MVP workshop in October,” he said.

The October workshop identified Bernardston's vulnerabilities in three areas, Lepore explained. The first area is "infrastructure," which includes limited emergency access routes, prolonged power outages and failing culverts. The second area is "society," which Lepore said includes concerns regarding homes in the floodplain, seniors on fixed incomes, flooding and drought on local farms. The third area, "environment," relates to frequent flooding in the Center Village district, remote high-risk forest fire areas and invasive species.

Thursday's "listening session" is also the last step needed for Bernardston to receive its MVP certification from the state's Executive Office of Energy and Environmental Affairs. Once finalized, the certification will make Bernardston eligible to apply for specific grants to address the identified town priorities and additional challenges brought on by climate change.

The MVP certification process began last February, but was delayed by the pandemic, with Planning Board members working off of the town's Multi-Hazard Mitigation Plan. Lepore said the Planning Board "gleaned information" to bring to the workshop in October, and discussed the MVP process and town priorities with Bernardston town officials. Thursday's meeting could further define, redefine or expand upon the list of priorities and concerns created in October.

"That's why it's so important we have attendance," Lepore said. "We want to hear from the townspeople about their concerns."

Registration for the community listening session, at tinyurl.com/ycltvhcu, is required to participate.

Zack DeLuca can be reached at zdeluca@recorder.com or 413-930-4579.



[environment \(/keyword/?keyword=environment\)](/keyword/?keyword=environment) [climate change \(/keyword/?keyword=climate change\)](/keyword/?keyword=climate change)

[bernardston ma \(/keyword/?keyword=bernardston ma\)](/keyword/?keyword=bernardston ma)

[municipal vulnerability preparedness \(/keyword/?keyword=municipal vulnerability preparedness\)](/keyword/?keyword=municipal vulnerability preparedness)

f Share on Facebook

(<https://www.facebook.com/sharer/sharer.php?s=100&u=https%3a%2f%2fwww.recorder.com%2fBernardston-s-vulnerability-preparedness-process-wrapping-up-with-Thursday-meeting-38260127>)

COMMUNITY MVP* VIRTUAL LISTENING SESSION

* Municipal Vulnerability Preparedness

**January 14, 2021
6:30 to 7:30 PM**

- ✓ Your Input is Important!
- ✓ Last Step for Town Certification
- ✓ Major Funding for Climate Change Preparedness



Post Hurricane Irene 2011, Fox Hill Rd; Photo J. Lepore

Register in advance for this Zoom webinar: <https://tinyurl.com/y9zhlqsy>


After registering, you will receive a confirmation email containing information about joining the webinar.

Questions? Contact John Lepore futurelandsdesigns@gmail.com

Hosted by the Bernardston Planning Board and the Franklin Regional Council of Governments



MVP Listening Session Presentation



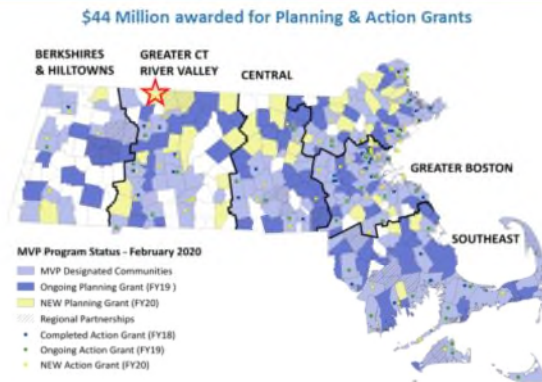
Municipal Vulnerability Preparedness (MVP) Listening Session

Town of Bernardston


January 14th, 2021

Agenda	Municipal Vulnerability Preparedness (MVP)
<ul style="list-style-type: none"> • Overview of the Municipal Vulnerability Preparedness (MVP) Program • Overview of Bernardston's MVP Planning Process • Summary of Outreach & Workshop Findings • Discuss Your Concerns & Brainstorm Potential Projects 	 <ul style="list-style-type: none"> ✓ Provides support for MA municipalities to plan for climate change resiliency and implement priority projects ✓ Provides a simple, straightforward process ✓ Certifies municipalities as MVP communities ✓ Provides funding to complete design & implementation of resiliency projects  <div> <p>1. Engage Community</p> <p>2. Identify impacts & hazards</p> <p>3. Assess vulnerabilities & strengths</p> <p>4. Develop & prioritize actions</p> <p>5. Take action</p> </div>


Massachusetts Municipal Vulnerability Preparedness (MVP) Program Launched 2017




Changing Climate Variables




Increased precipitation



More frequent droughts



Higher temperatures



More frequent & intense storms


Climate change **increases** existing risks
Bernardston is already facing

Municipal Vulnerability Preparedness (MVP)

Bernardston Community Outreach May – August 2020

- Farmers, local businesses, town departments, conservation organizations
- Asked how they have been impacted by natural hazards and what their concerns are for the future





Municipal Vulnerability Preparedness (MVP)

Community Components



Bernardston Community Resilience Building Workshop – October 14th, 2020

- ✓ Identify top local natural and climate-related hazards of concern
- ✓ Identify existing and future strengths and vulnerabilities
- ✓ Develop a list of prioritized actions for the Community

Workshop Participants



Benefits of having participants from different sectors/departments:

- Local knowledge and experience
- Working across departments / sectors
- Reaching consensus

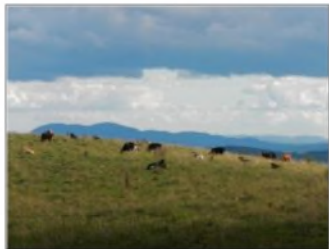
Workshop Outcomes

A climate resilient town will be able to maintain functions, protect its residents and emerge stronger and better prepared for a changing climate.

RESILIENCE



Your Input



- Name
- Position/Role
- What concerns do you have about *climate change and natural hazards* and their impact on Bernardston?
 - ✓ Infrastructure
 - ✓ Residents
 - ✓ Environment

BERNARDSTON'S TOP HAZARDS



Photos courtesy of the Greenfield Recorder and John Laporte

Bernardston's Vulnerabilities



Infrastructure

- Limited emergency access routes
- Prolonged power outages
- Falling culverts



Society

- Homes in the floodplain
- Seniors on fixed incomes
- Flooding and drought on local farms



Environment

- Frequent flooding in Center Village
- Remote high risk forest fire areas
- Invasive species

What do you think is most vulnerable to climate change?

Type the corresponding # in the chat box



Critical Facilities / Infrastructure:

1. Roads and bridges
2. Power grid
3. Drinking Water
4. Wastewater/septic
5. Communications
6. Housing
7. Emergency Shelters
8. Critical Town Facilities
9. Schools
10. Access to Hospitals / Medical Facilities
11. Other (Please specify)

BERNARDSTON'S TOP STRENGTHS

- Active community groups and volunteers
- Lots of protected open space
- Roads and Culverts well maintained by DPW
- Zoning Bylaws



What do you think is most vulnerable to climate change?

Type the corresponding # in the chat box



Population / Society:

1. Public health
2. Access to emergency supplies
3. Vulnerable populations
4. Public services
5. Economic impacts
6. Other (Please specify)

Bernardston's MVP Action Plan



1. Discuss MVP Action Grants
2. Summarize the Draft Recommendations
3. Hear your ideas about Projects and Actions Bernardston could take

What do you think is most vulnerable to climate change?

Type the corresponding # in the chat box



Environment:

1. Loss of natural habitat to invasive species
2. Forest degradation
3. Local food security
4. Water quality & water supply
5. Other (Please specify)

MVP Action Grants

Planning, Assessments, and Regulatory Updates

Nature-based Solutions for Ecological and Public Health

Resilient Redesigns and Retrofits for Critical Facilities and Infrastructure

Nature Based Solutions – Local Examples



Rain garden at the Girls Club, Greenfield MA



Low impact development project, Greenfield MA

Hazard Mitigation Plan High Priority Action Items

Develop and implement a record management plan to digitize and/ or duplicate important records housed in the Town Hall and other town facilities to mitigate the potential loss of information from a hazard event.

Implement the recommendations in the *Bernardston Center Village Groundwater Report: Investigating Evidence and Causes of Rising Groundwater*

Seek funding and technical assistance to expand and update the Vulnerability Assessment for properties located within the 100-year floodplain, using Assessors' data and other available information.



Projects that are not MVP Competitive

- Diesel generators
- Tree removal
- Emergency preparedness projects that don't incorporate climate projections/planning
- Projects that repair to previous conditions without consideration of climate projections



Draft Recommendations

Action

Key Points

Address stormwater management & drainage issues

- ✓ Obtain funding for surveying road boundaries
- ✓ Complete a Rural Roads/Dirt Roads Assessment
- ✓ Develop an education and outreach plan for residential stormwater management

Hire a consultant to design & install larger box culverts

- ✓ Target culverts the DPW cannot replace, such as the culvert on Eden Trail

Evaluate public buildings for onsite power generation & battery storage

- ✓ Several departments do not have automatic generators

Identify opportunities for upland floodwater management and storage in the Fox Hill Brook watershed

- ✓ Address the flooding issues in Bernardston's Center Village

Develop and implement a record management plan for Town Records


- ✓ Digitize and/or duplicate important records housed in municipal buildings

Brainstorming Resiliency Actions

Top Vulnerabilities Discussed Tonight:

- Update with participant feedback

Incorporating feedback into the MVP Report

Community Resilience Building Risk Matrix						www.communityresiliencebuilding.org				
Legend: Priority for action over the short or long term (Low) (Medium) (High) Y = Vulnerability & Strength				Top Priority Hazards						
Recommendations				Flooding	Extreme Temperatures	Wildfires	Severe Storms	Priority	Time	
Feature				Location	Ownership	V/S		H	L	Short Long
Infrastructure										
Culverts and Bridges	Culvert on Eden Trail Road at Hill Brook, after bridge, Bernardston Town	Town/State	Y	Culverts and bridges throughout town are vulnerable and in need of regular inspections to ensure they are safe. The town should consider replacing culverts with larger box culverts to improve hydraulic capacity and reduce the risk of failure. The town should also consider replacing bridges with more resilient structures.	X			X	H	Y
Town Records	Town Hall	Town	Y	For smaller locations in Town, the Highway Department maintains a Culture Management Plan to protect records. All records in Town are registered. The Highway Department provides records support. Most of the Town's records are stored in an unsecured location in the town hall's record room. There is no fire protection for the records. The town should consider moving records to a secure location and implementing a record management plan to digitize and duplicate important records.	X		X	X	H	Y
	Municipal Departments (such as the Highway, Fire, and Police Dept.)	Town	Y	Most departments in town are working on developing a record management plan (RMP) and are incorporating record backup into their plans.	X		X	X	H	Y

We need your input!

- **2 Week Public Comment Period** through February 3rd
- The full draft will be available at: <https://www.townofbernardston.org>
- Submit comments to John Lepore, MVP Project Manager
futurelandsdesigns@gmail.com



Town of Bernardston



Municipal Vulnerability Preparedness (MVP) Program

MVP Resiliency Plan

December 2020

Facilitated by the
Franklin Regional Council of Governments
A State-Certified MVP Provider



NEXT STEPS

1. Endorse your MVP Plan
2. Apply for MVP Grants

<p>Montague</p>  <p>MVP Grant: \$33,750 Match Amount: \$1,250 Total Project Cost: \$45,000</p>	<p>Montague City Road Flooding Protection Project: Design and Permitting</p> 
<p>Deerfield</p>  <p>MVP Grant: \$47,325 Match Amount: \$15,675 Total Project Cost: \$63,000</p>	<p>Culvert Redesign and Retrofit and Bylaw Update</p> 