Sandisfield, Massachusetts

Community Resilience Building Workshop
Summary of Findings
June, 2019

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Town of Sandisfield

Community Resilience-Building Workshops

Summary of Findings

April 3rd & 10th, 2019

5-8 p.m.

Sandisfield Community Resilience-Building Process & Overview

The need for municipalities to increase resilience and adapt to extreme weather events and natural hazards is becoming more evident among the 32 municipalities in Berkshire County, MA. The rural Town of Sandisfield, Massachusetts has experienced more intense and frequent storm events leading to flooding of roads, damage to critical infrastructure and private properties; as well as endured prolonged power outages with blocked evacuation routes from downed trees during fierce winds, nor'easters and winter ice storms. It is generally acknowledged that climate change is a reality that will continue to make its presence felt in the future, in the form of more extreme weather and weather events. Regional climate data for western Massachusetts further reinforces this anecdotal evidence.

Sandisfield is in the southeastern corner of Berkshire County, Massachusetts, and is the largest community land wise in the Berkshires, totaling 52.95 square miles with 90 miles of road. Fifty-two miles of the total 90 miles of road are unpaved. Sandisfield is a heavily forested (86.9% of land area,) rural community with many streams, ponds, lakes and wetlands, that make it a very desirable place to live and to visit.

The West Branch of the Farmington River forms the Town's eastern border, with many smaller tributary streams, including the Clam River, Miner Brook, Buck River, Silver Brook, and Cherry Brook and others, traversing the hilly landscape. There are several lakes and ponds - including Upper and Lower Spectacle Pond, Abbey Lake, Atwater Pond and Lake Marguerite - that provide residents and seasonal visitors with quiet enjoyment and numerous outdoor recreational activities.

The town's natural beauty and rural charm have long made it a popular location for summer homes. Retirees, including many second homeowners, make up a large percentage of the population of 915+/- (U.S. Census, 2010). Twenty-six percent of all households in Sandisfield are occupied by persons over the age of 65. Additionally, Sandisfield's population decreases to

between 400-500 during winter months, with over 50% of homes left unoccupied, as snowbirds seek warmer weather elsewhere.

Sandisfield experienced a steady increase in population over the 20th century, however, that trend has been reversed in the 21st century. The Town's population is expected to decrease by .05% at the next U.S. Census in 2020, to approximately 910 persons, mirroring a similar declining trend in the rest of Berkshire County and the state of Massachusetts as a whole. The U.S. Census figures also predict that the number of residents above age 65 in Sandisfield is expected to continue to increase.

The local economy of Sandisfield is comprised of commercial farming and logging interests, outdoor equipment and recreation-related businesses, arts organizations, several inns and restaurants and a small service sector, including the Sandisfield Times newspaper and several professional consultants providing a range of services. In addition, a private, 57- bed skilled nursing and rehabilitation facility that provides specialized care to veterans through a contract with the U.S. Veterans Administration, is also located in Sandisfield.

The combined increase in severe storm events causing prolonged power outages, repeated flooding of roads and properties and the shift in Sandisfield's population toward vulnerable older and seasonal visitors, has prompted the Town's leadership to take a proactive approach to assessing their vulnerability to severe weather and other natural hazards. The Town of Sandisfield's Municipal Vulnerability Preparedness (MVP) efforts to protect the community's residents, properties and natural environment, are detailed below.

During the winter and spring of 2018-2019, with funding from the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), the Town of Sandisfield began the process of conducting a Municipal Vulnerability Preparedness (MVP) assessment. Sandisfield formed the Sandisfield MVP Committee with the Public Works Director, Brad Curry as the project lead, and with the Sandisfield Emergency Management Director (EMD) John Burrows as the chair of the committee. The Sandisfield MVP Committee was assisted by Berkshire Regional Planning Commission, a state-certified MVP provider, to assist with the planning and outreach process, using the Community Resilience Building (CRB) Workshop process and methodology as a guide.

The Sandisfield MVP Committee held three facilitated meetings to assemble data on the Town's infrastructure, identify known hazards to residents, seasonal visitors public and private property, and the natural environment. The Committee also reviewed existing departmental plans, emergency management practices and operating procedures and Town zoning bylaws, to see what policies and protections were already in place – all with an eye toward new additions or enhancements, for greater effectiveness.

The Sandisfield MVP Committee members, as well as other municipal department staff and board members, completed the detailed Community Resilience-Building Survey, describing hazardous or potentially hazardous conditions from their perspectives. In addition, the MVP providers held one-on-one interviews with the Council on Aging Board of Directors and the

Administrators of the Berkshire Skilled Nursing & Rehab Center, focusing on vulnerable members of the community. The survey and interview responses were used to augment MVP Committee discussions, mapping activities and best-practice research.

The Sandisfield MVP Committee developed a long list of community stakeholders whom they thought would have valuable input during a two-part Resilience Building Workshop, held from 5-8 p.m. on two consecutive Wednesday evenings, April 3rd and 10th, 2019. The invitee list included those who would provide information and input from the regional, municipal and the private sectors. Those stakeholders included town officials and town department staff, first responders, residents, respected elders, and business owners - all of whom could provide unique details about the impacts that severe weather has had in Sandisfield over time. Altogether, the Community Resilience-Building Workshops parts I and II, were attended by 30 people.

A central objective of the Community Resilience Building Workshops was to introduce workshop attendees to climate change trends and regional weather events and their impacts. A PowerPoint presentation was used to communicate this information. An additional central

objective was to review the Workshop goals, divide into two groups, and to develop a Natural Hazard Risk Matrix, that:

- Defined the top weather and related hazards in Sandisfield (Workshop, part I)
- Identified existing Town strengths and vulnerabilities (Workshop, part I)
- Develop a detailed list of suggested Actions for Town departments, boards and citizen-volunteers to take, working with the broader community, state and federal agencies and political leaders, to better protect life, property and the environment in Sandisfield (Workshop, Part II) and
- Identified opportunities to increase resilience and reduce the risk of weather-related hazards to life, property and the environment, both in the short and long-term (Workshop, part II)

On April 29, 2019 at 7:00 p.m., the MVP Committee and the Berkshire Regional Planning Commission held a Public Information Session to present the Town of Sandisfield Select Board and members of the public, with the draft results from the April 3rd and April 10th Workshops. The Public Information Session was advertised on the Town website and was posted/advertised per the MA Open Meeting Law requirements, as a public meeting.

Town of Sandisfield
Board of Selectmen

Posting and agenda for meeting Monday, April 29, 2019 at 7:00 p.m. at the Town Hall Annex.

1. Discuss purchase order for next fiscal year
2. Review and comment on Sandisfield Municipal Vulnerability Preparedness Plan
3. Selectmen's updates
4. Town Administrator updates
5. Discuss future agenda items
6. Review mail
7. Review and sign warrants
8. Topics not reasonably anticipated by the Chair

Materials resulting from the CRB Workshops, including a Draft Master Risk Matrix with prioritized Actions and mapped areas of concern, and a Draft Community Resilience Building Workshop Report, were displayed and reviewed with the assembled Select Board members and residents. Residents who had not participated in the Workshops, had the opportunity to ask

questions or make additional comments of both the MVP Committee members, workshop attendees and the MVP providers. Each attendee was given 3 colored adhesive "dots" to vote on those Actions they deemed the highest priority.

Top Hazards and Vulnerable Areas of Concern

(a) Top Hazards

During the Community Resilience Building Workshop, participants in two groups were asked to confirm the top natural hazards to the Town as identified by the MVP Core Team in previous meetings and interviews. There was surprising unanimity between breakout groups in identifying the top Priority Hazards.

Some of the most severe weather events such as Tropical Storm Irene of 2011, have caused significant road flooding throughout Sandisfield, including damaging and flooding the main evacuation routes. The extremely damaging winter ice storm of 2008 caused main town roads to be physically blocked by downed trees and power was out for over three weeks in parts of town. These intense and life-altering storms remain fresh memories to many.

All the identified vulnerable "problem areas" were drawn onto maps for later use by the Town of Sandisfield for ongoing vulnerability and mitigation planning and action implementation.

The Top Hazards identified are:

1 Flooding
2 High Winds
3 Ice/Snowstorms
4 Extreme or Fluctuating Temperatures
5 Heavy Rain

(b) Vulnerable Areas

Each Workshop group was given a set of maps including a base map showing Town wide critical facilities - municipal buildings, flood control dams, evacuation routes and neighborhoods. Other maps presented included flood hazard areas with buildings delineated, topographic maps and state-owned forest lands.

Participants were invited and encouraged to "mark up" the maps to facilitate their conversation and locate where past storms have impacted the Town, or where more recent hazards have occurred. The areas cited as being of most concern are as follows:

Infrastructural:

Roads, culverts and bridges throughout Sandisfield that flood repeatedly: Sandisfield Road/ Rte.57, Dodd Road, Hammertown Road, Cold Spring yard, New Hartford Road at Shade Road intersection, New Hartford Road near Crofut Road. Cronk Road and Abbey Road are unpaved and inaccessible during winter/spring months.

Flooding of public and private properties: Flooded basements and septic systems are commonplace after severe weather events in Sandisfield. Private properties have lost acreage through stream-bank collapses or river scouring, especially in the New Boston neighborhood and along Clam Brook on Rte. 57.

Dams: State- and privately-owned flood control dams present a concern to the Town, due to their poor condition and lack of, or unknown level of upkeep. The dams were last assessed by the State Office of Dam Safety over five years ago (Map, Appendix A). Town officials have not formally approached private dam owners to discuss dam conditions.

Emergency Communications Infrastructure: Telephones via landlines and cellular systems do not provide complete coverage, making emergency communications difficult, spotty or impossible, during day-to-day operations and during severe weather events and power outages. Radio towers for shortwave do not provide reliable service, especially for emergency management personnel and First Responders calling in to central station for assistance.

Societal:

Seasonal and Vulnerable Populations: Elder residents, medically vulnerable persons, and seasonal visitors all have additional needs during emergencies in town. Identification and coordination among these populations in planning for emergent situations will require engagement and establishment of a formal process for two-way communications and better cooperation during severe weather.

Emergency Management and Sheltering Capability: Many residents of Sandisfield have backup power generators and are willing to look out for neighbors or friends during severe weather. There is currently no location in Sandisfield with the capacity to serve the entire population as an overnight shelter, though there is a warming/cooling station at Fire House #2 in Sandisfield that has been used for short stays for a limited number of people. There is a full, regional shelter in Great Barrington, MA, however, road conditions during and after severe storm events have prevented residents from safely traveling to any shelter, so sheltering-in-place is the first and preferred, solution.

The Berkshire Rehab & Nursing facility in Sandisfield has the capability to shelter up to 6 members of the public for up to 1 full week, if necessary. Many residents in the New Boston neighborhood said they would be more likely to go stay with family or friends out of the region, or travel south into Connecticut, because is closer and an often-safer route. State Rte. 8 is usually more accessible for evacuations than other in-town routes. Route 57, the main evacuation route that traverses Sandisfield, is typically impassable, as noted above, and is so heavily damaged from previous storms that it inhibits comfortable travel even on a clear day.

There are no local general stores, grocery stores, or gas stations in which Sandisfield residents can "stock up" prior to an upcoming storm, requiring all residents to do some advanced planning in notice storms, and preventing the gathering of supplies in no-notice storms. The closest grocery store is 16 miles away, approximately a 30-minute drive. Encouraging residents to prepare an Emergency kit is an imperative.

Public Communications & Education: Residents are largely unaware of weather hazard risks and what emergency procedures are in place to protect life and property from the impacts of hazards or severe weather. Many strategies for improving outreach and sharing of important information were suggested during the Workshop discussions.

Environmental:

Environmental Integrity - Riverbanks and floodplains – The increase in severe weather has caused a heavy use of road salt and sand that wash into streams. Heavy rains cause erosion,

riverbank scouring and increased turbidity in Sandisfield's surface waters, particularly in streams that reach the Farmington River.

Forest Cover: The abundant forest cover in Sandisfield is both an asset and a risk, as forests require proper monitoring and management. Aging forest cover, threats from insect infestation and fire, tree damage and limb losses from severe ice and windstorms, were all cited as areas of ongoing concern.

Insect and Tick Populations: Fluctuating temperatures and severe weather have exacerbated the tick and mosquito populations in recent years. The threat from tick and mosquito-borne illness is on the rise county-wide. Several town employees and community members said that they often have several ticks on them after briefly being outdoors. Public education about tick-borne and mosquito-borne illnesses is recommended.

Septic Systems, Soils & Stone: The rocky, steeply rolling landscape and clay soils found in Sandisfield are not ideal for septic systems, however, every home in Sandisfield has one. The difficulty with the soils and geologic characteristics of Sandisfield can make home building and siting difficult. Soils that do not readily absorb water can lead to ponding and severe erosion on steep slopes if development, site work and landscaping are not handled sensitively. Homeowner and builder education about materials, plants and landscaping appropriate to Sandisfield's topography/geology is recommended.

In addition, one practical suggestion that was made during Workshop II, was to use a stone crusher to take advantage of readily available stone found all over Town, for road maintenance, thus reducing the cost of gravel purchases on Sandisfield's tight budget.

Challenges Presented by Hazards

Flood and Severe Storm effects on Roads & Buildings– There are several main roads that traverse the Town of Sandisfield, including Route 57, Route 8, Route 183 and Town Center Road. All are identified as regional evacuation routes. During severe storms and resulting inundation, fallen branches and downed wires have blocked these evacuation routes completely, forcing emergency responders to use secondary and "off road" routes into Town, and preventing residents and visitors from evacuating. With approximately 150 ambulance transports every year to medical facilities in the region in both Massachusetts and Connecticut, the inaccessibility of Sandisfield town roads presents a serious threat to residents. This issue was identified as the highest priority by Workshop attendees.

Flooding from heavy rains and winter freeze and thaw cycles is an ongoing problem in Sandisfield. Fifty-two of the total 90 miles of road in Sandisfield are unpaved, and become muddy, rutted, and filled with sediments from floodwaters. Additionally, the paved roads have become cracked, washed away, and filled with potholes so extreme that responders take alternate routes to avoid vehicle damage when responding to emergencies. The ongoing damage

to roads required continual, costly maintenance that is impossible for the Town to keep up with. One of the largest components of the Town's budget is for the repair of roads, including gravel, time and equipment.

Municipally owned critical facilities, including the Town Annex, Old Town Hall, the Highway Department complex and Fire Stations #1 and #2 are spread out along Route 57 and Route 8., with no true town center. Sandisfield's Emergency Operations Center is located at the Fire Station #2, just outside of the floodplain.

There are 88 public and private residential properties located in the floodplain, and the inability of residents to escape due to poor road conditions, makes the creation of a safe, in-town shelter or better, a shared use Community Center, a practical and logical option for Sandisfield to pursue.

High winds often accompanied by snow and ice or heavy rain have wreaked havoc with Sandisfield's forested landscape. Power lines and polls, as well as cell and radio towers are largely exposed to the elements at high elevations, making them vulnerable to significant damage leading to power outages, sometimes for days or even weeks at a time. Some residents are prepared with backup heat sources, food supply, and generators, but most other residents and visitors must make other arrangements. It was suggested at the Workshop that the lack of sheltering locations might be mitigated by asking residents to share the use of their generators or make spare room available to friends or near neighbors, during power outages, creating a tight-knit neighbor program. Town Hall and a few other locations have backup generators for short-term warming or cooling, but Sandisfield currently lacks a location with longer-term sheltering capability that has appropriate hygiene and food preparation facilities.

Extreme and fluctuating temperatures were recognized by workshop attendees as being a top hazard. Most residents mentioned that the winters they are experiencing are more severe and summers are hotter, requiring the use of air conditioners, where in past decades the immense tree cover provided enough shaded relief. In addition, drought and low flow in rivers and streams is seen as a threat, even within a town of ample surface water resources. Massachusetts Climate Change Projections show that weather pattern changes could bring more extreme temperatures and precipitation. A large percentage of Sandisfield forest land is owned by the Commonwealth, but in the event of a fire, the local Fire Departments must respond first. Sandisfield relies on private wells, some of which have dried up during periods of low precipitation.

(a) Specific Categories of Concerns & Challenges

After identifying the top hazards that pose a risk to the Town of Sandisfield, Workshop attendees were asked to focus on Sandisfield's infrastructural, societal and environmental features that have been or could be directly impacted by climate change. They were asked to identify the

most vulnerable features, and list which needed further assessment, improvement, replacement or mitigation in the short or long term. The results are as follows:

Infrastructure Vulnerabilities

- Road washouts occur frequently along main evacuation routes. There is an overall lack of drainage structures. Clogged culverts and unpredictable beaver activity have caused repeated flood situations on public and private land.
- Dirt roads are blocked, often muddy and rutted, impeding access by residents and emergency vehicles.
- Multiple flood control dams are in poor condition and have a high risk for failure. Engineering assessments are needed, as well as necessary repairs.
- Sheltering capability is extremely limited in town.
- Backup power generators are limited in town facilities.
- Eighty-eight properties are in the floodplain. There are no current requirements for building or renovating in the floodplain to consider implications of climate change or use of green infrastructure solutions.
- Town Library and private homes experience repeated flooding.
- Residential wells at risk of running dry in drought.
- Utility lines are downed frequently, especially in exposed areas in the higher elevations of town.
- Mix of communications infrastructure provides incomplete coverage (cell service, landlines, broadband, satellite, antennae, etc.).
- There is no full-service shelter. The community would greatly benefit from the development of a Community Center located in an accessible area, out of flood hazard area.

Societal Vulnerabilities

- Vulnerable populations, including elders, medically vulnerable and second homeowners/summer visitors (Airbnb renters) may require special preparedness strategies and outreach prior to disasters occurring.
- Community-wide communications system to residents and seasonal populations is inadequate and should be expanded.
- Code Red is voluntary and requires that residents and visitors sign up with the town.
- There are inadequate numbers of Emergency Volunteers & First Responders, including Emergency Medical Technicians (EMTs), due to fewer younger residents and due to most of the working population working outside of town. Weekday coverage of emergency medical response is of particular concern.
- Emergency preparedness initiatives with town and planning activities should be conducted more frequently.

Environmental Vulnerabilities

- Degraded water quality, including increased turbidity, siltation, and pollution is caused by runoff from roads and stream bank collapse.
- Bank erosion has caused significant amounts of trees to fall and resulted in loss of acreage for property owners.
- Septic systems in floodplain risk failure in minor and major precipitation events.
- There is a need for a long-range forest management and replanting plan, as aging forest cover is vulnerable to storm damage, susceptible to fire, insect infestations and tree/limb loss.
- Drought periods create risk of wells drying up. There is a need for a backup plan for dry hydrants and potable water supply if significant amounts of private wells dry up.
- Beaver dams cause road flooding/washouts with little or no warning.
- Increased areas of standing water, flood events, and warming temperatures have cause significant increases in tick and mosquito populations in Sandisfield, creating a higher risk for the transmission of diseases such a Lyme and West Nile Virus.

Current Strengths & Assets in Sandisfield

Due to many recent experiences with extreme weather and the generally tight-knit community character, Workshop attendees were quick to point out the existing strengths in the Sandisfield community, detailed below.

- Long-term cooperative practices developed over many years in this rural region have resulted in a well-functioning emergency response routine - including mutual aid - to good effect.
- Reinforcing and expanding supportive practices, public education and emergency drills for the entire community, especially among the transient summer residents and vulnerable populations, will help ensure increased preparedness and improved resiliency to seasonal storm events.

- Sandisfield's Town staff is proactive but faces budget limitations due to high percentage of state-owned and other tax-exempt properties. Financial constraints make outreach, master planning and prioritization of Town projects essential.
- The Berkshire Skilled Nursing & Rehab facility is seen as a town asset and good community partner. They are also the largest private employer in town.
- The residents of Sandisfield look out for one another, often reaching out to neighbors to check on their well-being, or to share food and shelter with neighbors during the long winter months.
- Municipal staff is dedicated and willing to address infrastructural maintenance and residents' safety needs.
- Utility Companies and contractors cooperate with Town Highway Department and Tree Warden to increase tree trimming near power lines.
- Sandisfield is a small, cohesive community in which residents are independent and largely self-sufficient yet look out for one another.
- Residents are supportive of local government and willing to commit Town funds to advance protection and mitigation strategies.
- Police, Fire, Highway and EMD work together frequently and effectively.
- Lakes, streams, and forests provide habitat and a cooling effect for a large variety of wildlife and residents.
- Rural character of the town has broad appeal, making Sandisfield a very attractive community in to live and travel to.
- Regional mutual aid is effective. There is good coordination between town and surrounding communities.

Part II of the MVP Workshop was held on April 10th, 2019. Building on the Town's top Vulnerabilities and Strengths, Workshop attendees were asked to formulate and suggest possible actions or solutions to address each identified vulnerability, or to ensure the continuation of the current strengths in town.

Suggestions ranged from identifying the need for further research or professional assessments (i.e. engineering studies, hydrologic studies, identifying best management practices for streambank stabilization, etc.), to practical suggestions for forming committees to focus on improving town communications and economic development. Additional suggestions from Workshop attendees included developing educational programs on safety and emergency preparedness, conducting environmentally friendly bank stabilization and rain storage projects, and to initiate conversations with Sandisfield's private dam owners and the MA Office of Dam Safety about the urgent need for ongoing dam maintenance.

The Workshop groups characterized the recommended Actions they developed as either "high", "medium," or "low" priority and helped determine a timeframe for taking action (short, long, or ongoing.) As a last step, each Group was directed to choose 3 or 4 top priority actions to bring to the full, reconvened group to discuss and integrate with the others. The results of those

ranking activities can be found on the completed Master Matrix Table found in Appendix A and as summarized herein.

Top Recommendations to Improve Resilience in Sandisfield

The most frequently mentioned top priority from the workshop participants revolved around road maintenance and improvements, and in particular, improvements for Route 57. The condition of Route 57 is greatly negatively affected by the high car volume and moderate to extreme weather events. The Town's road maintenance budget is hugely limited by much of the Town's land being untaxable, or only being subject to low tax rates (State owned land and Chapter 61 land). The lack of funding for improvements and basic repair work over the years has led to the poor condition of the road. Route 57 is the fastest route to the nearest hospital (Fairview Hospital) and the condition of the road has caused ambulances to be forced to travel slower, longer routes to transport patients to the hospital to avoid the inevitable wear and tear on their vehicles, and the condition of this route would certainly affect future emergency response during disasters.

As reflected in the attached Risk Matrices, repetitive flooding of private properties and roads in specific areas of the town and threats to public infrastructure were major concerns raised by the break-out groups. These themes, together with concerns about emergency communications and sheltering and the control of beaver populations, rose to the top when all the groups reconvened at the end of the Workshop. Because there were so many different areas across Sandisfield that were named by the small groups as specific priority actions, it became apparent that the Town would not be able to afford to address all of these. The participants agreed that funding sources must be sought to help address these vulnerabilities and priorities, and to do so in a way that protects the areas of concern and infrastructure from future flooding and other extreme weather events.

(a) Top 4 Recommendations:

- Continue lobbying for regional legislative assistance to secure line item funding to upgrade Rte. 57 across multiple towns; enlist the aid of the public to reach out to State legislators;
- Regularly pursue Capital Improvement Grants for other roads requiring repair, paving or other upgrades. Establish beaver monitoring program with help from homeowners.
- Support the work of Broadband Committee to obtain full coverage in Town; consider multi-town partnership to complete.
- Investigate other ways to recoup tax revenue from State Forest lands used for logging and Chapter 61 lands; including road-use fees in lieu of taxes. Establish an economic development working group to bolster tax base in other ways

(b) Top Priorities for Sandisfield (*See Master Risk Matrix Appendix A)*

Highest Priorities

1) Road Upgrades & Maintenance (Culverts, stream crossing bridges, pipes, swales) to manage flooding, with integration of beaver monitoring and use of nature-based solutions whenever possible.

2) Develop educational campaign to education public on emergency procedures, evacuation routes, emergency kit preparation, buddy system, flood hazard risks generally. COA and EMD to develop a town wide survey to identify vulnerable or isolated residents.

3) Write a letter to MA Office of Dam Safety regarding condition of dams and conduct outreach to private dam owners to for same.

4) Town boards and departments to reconsider enacting flood hazard zoning for areas regularly affected by flooding and take other conservation measures; ask
MA Riverways or other programs for assistance.

5) Consider building a new, mixed use Community Center that can also function as a shelter.

6) Establish an economic development committee to increase tax base using natural assets (like fishing and hiking) to attract younger residents and new businesses. Market Sandisfield as a good place to live.

7) Complete Broadband installation town-wide and bolster related communications Infrastructure, including a short-wave radio repeater for Emergency management.

8) Route 57 and other main roads require major upgrades. Continue to work with adjacent towns and legislators to obtain funding. Participate in Complete Streets and other programs for secondary road work.

Moderate Priorities

1) Distribute literature on bank and slope stabilization, water conservation methods and septic best practices to homeowners

2) Begin process of identifying reliable backup water source for Town to replace current dry wells.

3) Encourage annual town-wide chipping of downed branches/trees to minimize risk of fire.

4) As MA Rivers programs for assistance with bank stabilization.

Lower Priorities

1) Replace lawns with wet-tolerant woodland plantings; enact floodplain zoning.

2) Develop a town forest management plan.

3) Enlarge drainpipe and regrade at library.

At the public forum held on April 29th, Sandisfield residents and the Sandisfield Select Board provided further input on which projects the Town should prioritize for action. Residents and Selectmen were given 3 colorful stickers each and asked to place them next to the top three actions that they believed the Town should pursue. Materials from the public forum can be found in Appendix B.

*CRB Workshop Invitees and Attendees**

Below is a list of names of residents and town employees/volunteers who were invited to participate in the Workshop. Those who attended are marked with an asterisk (*).

Name/Title	Affiliation
Paul Gaudette*	Sandisfield Planning Board & ConComm
Brenda Larson*	Sandisfield Cemetery Comm. & ConComm
Jeff Bye	Sandisfield Broadband Committee
Dolores Harasyko	Sandisfield Town Clerk/Admin. Assistant
Teresa Sponholtz, Librarian	Sandisfield Library & Community Center
Mary Turek	Strategic Planning Committee
Ruth Dec-Friedman*	Resident, Flooded Property owner (*photos)
Fred Ventresco*	Sandisfield Town Administrator
Laurie Hills	Sandisfield Town Treasurer & Vet's Svces.

John Burrows*	Emergency Management Department
B. Dornbos, Executive Director	Farmington River Watershed Assn.
Michael Morrison, Chief*	Sandisfield Police Department/ A&M Auto
Ralph Morrison, Chief*	Sandisfield Fire & Ambulance
Anina Carr, Acting Chairperson*	Sandisfield Council on Aging
Keith Larson*	Sandisfield Highway Dept.
Brad Curry, Superintendent*	Sandisfield Highway Dept.
Mark Newman, Chairperson*	Sandisfield Select Board
George Riley*	Sandisfield Select Board
Brian O'Rourke*	Sandisfield Select Board
Eric Munson	Sandisfield Building Dept.
Joseph Gelinas	Finance Committee
Kathie Burrows*	Resident
New Boston Inn	Business Owners
Hillside Garden B&B	Business Owner
New Boston Sled & Crane Svce.	Business Owner
Kimberley Spring*	Sandisfield Board of Health
Villa Mia Restaurant	Business
When Pigs Fly Farm (Poultry)	Farming Business
The Sandisfield Times, Editors	Media
Eversource – M.Hancock	Electric Utility – Community Liaison
Tom Ryan	MA DCR
Ken Wagner , Manager	Otis Lake Assn.
Steve Grossman, President	Otis Lake Assn
Lynn & Steve Rubenstein*	Residents
Christine Tkacz*, Andrea Bell*	Berkshire Rehabilitation & Nursing/Athena

Town of Sandisfield Municipal Vulnerability Preparedness Committee

Name/Title	Sandisfield Town Board or Affiliation
Mark Newman, Chairperson	Board of Selectman
Michael Morrison, Chief	Police Department
Brad Curry, Superintendent	Highway Department
Anina Carr, Chairperson	Council on Aging
Ralph Morrison, Chief	Fire Department & Ambulance Svce.
Paul Gaudette, Chairperson	Planning & Conservation Commission
Fred Ventresco, Town Administrator	Town of Sandisfield

MVP Service Provider

The Berkshire Regional Planning Commission (BRPC) served at Sandisfield's MVP State-Certified MVP Service Provider.

Name	Affiliation	Attendee
Allison Egan	Senior Planner, Project Manager and Workshop Facilitator	*
Margaret McDonough	Planner, Breakout Group Leader	*
Mark Maloy	GIS, Data & IT Specialist	
Caroline Massa	Senior Planner, Breakout Group Leader	*

Acknowledgements

This project was made possible by a grant from the Massachusetts Executive Office of Energy and Environmental Affairs. Many thanks to the Sandisfield Municipal Vulnerability Preparedness Core Team and the residents of Sandisfield, for pulling together to make the Community Resilience Building Workshop and Municipal Vulnerability Planning process a success.

Special thanks to Mark Newman, Fred Ventresco and John Burrows, for coordinating the use of the facilities and kind assistance with the myriad details, including the food, promotion and coordination of the MVP planning process, the Workshop and follow-up Public Listening session.

Citation

Sandisfield MVP Advisory Committee, *Sandisfield Community Resilience Building Workshop Summary of Findings*, Sandisfield, MA, June, 2019.

Appendix A – April 3, 2019 and April 10, 2019 Workshop Materials

Workshop Agendas

Key Terms Handout

PowerPoint Presentation

Sandisfield Critical Facilities and Areas of Concern Map

Sandisfield Floodplain Map

Population Density Map

Sandisfield Zoning Map

Master Matrices

Climate Change Poster

Tropical Storm Irene Poster

Opportunities to Reduce Risk Poster

Community Resilience Building

Town of Sandisfield

Community Resilience Building Workshop, April 3, 2019, Part 1

~ Workshop Objectives ~

1) Understand connections between ongoing issues, hazard, and local planning and actions in your Community. Define top hazards.
2) Identify and map vulnerabilities and strengths to develop infrastructure, societal and environmental risk profiles for your Community.
3) Develop and prioritize actions that reduce vulnerabilities and reinforce strengths for your community - local organizations, academic institutions, businesses, private citizens, neighborhoods, and community groups.
4) Identify opportunities to advance actions that further reduce the impact of hazards and increase resilience in your Community.

ACTIVITIES and OBJECTIVES
5:00 p.m. -- Welcome, Food, Workshop Overview, Introductions, Posters *Objective: Workshop purpose*
5:15 p.m. -- Overview Presentation on Hazards and Vulnerability *Objective: Identify risks – What has already been identified? What is the data telling us?*
5:45-7:00 p.m. – Small Team Exercise *Objective: List Top 4 Hazards in the Town and List Community Vulnerabilities and Strengths*
7:00-7:15 p.m. Break and Community Surveys
7:15-7:50 p.m. – Reconvene Small Teams – Present Vulnerabilities and Strengths
7:50-8:00 p.m. -- Wrap up and Next Steps

Join us for Part 2 of the MVP Workshop,
where we will prioritize action items for the town!
April 10, 2019 5:00-8:00 p.m.
Located at the Old Town Hall

Join us again for a Public Session to review results of the MVP Workshop
April 29, 2019 7:00 p.m.
Located at the Town Annex

Town of Sandisfield

Community Resilience Building Workshop, April 10, 2019, Part 2

~ Workshop Objectives ~

1) Understand connections between ongoing issues, hazard, and local planning and actions in your Community. Define top hazards.
2) Identify and map vulnerabilities and strengths to develop infrastructure, societal and environmental risk profiles for your Community.
3) Develop and prioritize actions that reduce vulnerabilities and reinforce strengths for your community - local organizations, academic institutions, businesses, private citizens, neighborhoods, and community groups.
4) Identify opportunities to advance actions that further reduce the impact of hazards and increase resilience in your Community.

ACTIVITIES and OBJECTIVES
5:00 p.m. -- Welcome, Food, Introductions *Objective: Workshop purpose*
5:15 p.m. -- Overview Presentation on Workshop 1 Results *Objective: Summary Findings From Last Workshop*
5:45-7:00 p.m. – Small Team Exercise Overview *Objective: Identify Action Items, Prioritize Actions, Identify Urgency of Each Action*
7:00-7:15 p.m. Break
7:15-7:50 p.m. – Reconvene Small Teams – Present Action Items and Prioritization
7:50-8:00 p.m. -- Wrap up and Next Steps

Join us again for a Public Session to review results of the MVP Workshop
April 29, 2019 7:00 p.m.
Located at the Town Annex

Natural Hazard Mitigation and Municipal Vulnerability Preparedness



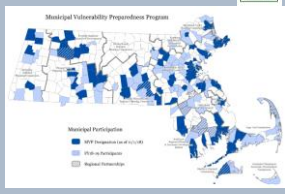
Town of Sandisfield
April 3, 2019

1

Municipal Vulnerability Preparedness Program 2019

Why MVP?

- Consider weather pattern observations and climate change projections
- MVP certified communities will have priority status for some state grant opportunities
- MVP grant funds may be more flexible than FEMA for local mitigation projects

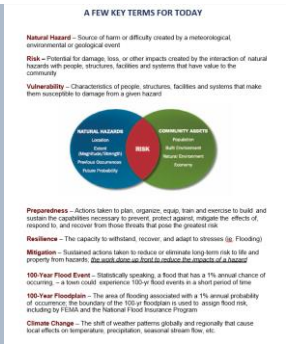


State and local partnership to build resiliency to climate change

1. Engage Community → 2. Identify CC impacts and hazards → 3. Complete assessment of vulnerabilities & strengths → 4. Develop and prioritize actions → 5. Take Action

2

A Few Key Terms for Today



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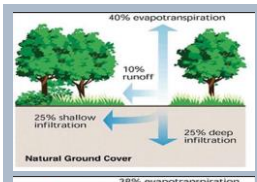
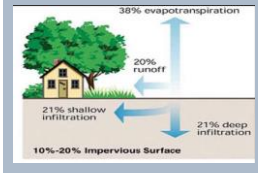
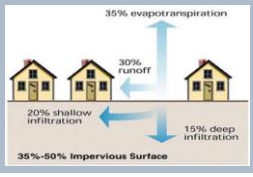


Changes in water patterns:

Impervious Surface = Increased Runoff





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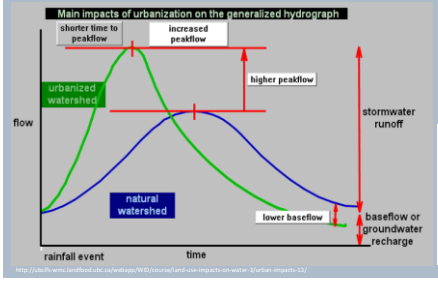
+ Piped runoff =

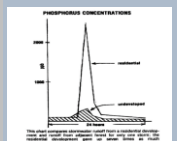


5

= Quicker, higher peak flow volumes



(And higher pollutant loads)



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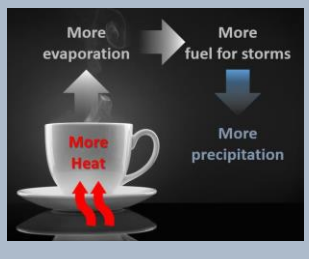
And Then There's Climate Change



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Key Observed Climate Changes in MA

Temperature: 2.8°F since 1895 (7-10°F by 2100)
Berk. temp. up 1.7°F since 1960

Growing Season: 10 Days Since 1950

Strong Storms: (heaviest 1% of annual) 71% Since 1958

8

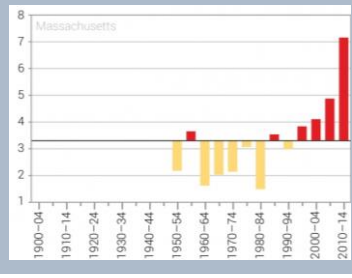
Extreme Heat Days in Hoosic Watershed

	Current	Projected by Mid-Century (2050s)	Projected by End Century (2090s)
Days per year above 90°F	≤1	+ 4 - 17	+ 6 - 50
Days per year above 95°F	0	+ 0 - 5	+ <1 - 11
Degree Cooling Days		+ 4 - 16%	+ 35 – 460%

9

Observed Number of Warm Nights

- Number of Nights where minimum temp. > 70° F



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Observed No. Extreme Precip. Events

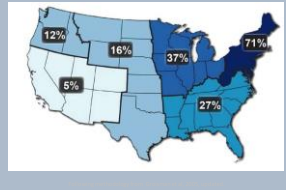
- Number of Events w/ Precipitation > 2" in 1 day*
  "Stepped Increase" in 1970-80s

* Different sets of data

11

More Extreme Precipitation

71% Observed 1958-2012



Change in 24-hour, 100-year Design Storms (inches)

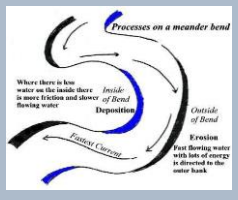
	NOAA TP-40	NOAA Atlas 14	Change
Boston	6.6	7.8	+1.2"
Worcester	6.5	7.6	+1.1"

12

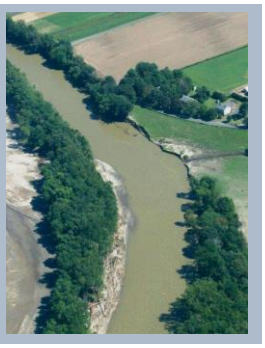
Rivers Move – Give 'em Room

Scour on the outside of meander bends.

Deposition on inside of bend



courtesy Carrie Banks, MA Division of Ecological Restoration



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Leave that floodplain open for the Big Event

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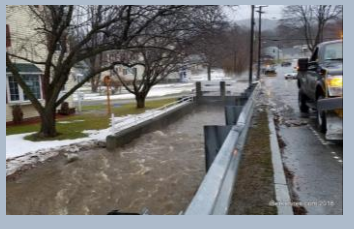
Winter Weather Changes

Cycles of cold and warm will increase, alter risks

- **Warmer temps:** Less snow pack = altered water regimes and soil moisture
  - Less groundwater recharge = lower baseflow in streams, rivers, reservoirs
  - Loss of snow insulation = increased risk of frozen pipes, drains
  - Dryer spring soils
- More rain-on-snow events
  - Increased runoff, risk of winter floods



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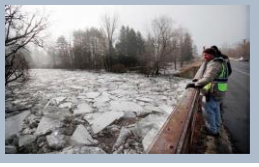
Winter Weather Changes

Cycles of cold and warm will increase, alter risks

- **Ice Risks:**
  - Ice storms = potential loss of electricity
  - Ice jams



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Ice Storm December 2008

- **Loss of electricity for 1+ million customers**
- **Some for more than 2 weeks**
- **FEMA obligates >$32 million in Mass.**
  - + State costs >$7 million
  - + Municipal costs >$5 million
  - + National Grid claims damages of >$30 million
  - + Small businesses without electricity "lose tens of millions of dollars"*

* MA Climate Change Action Plan

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T.S. Irene 2011

- 500,000+ MA residents without electricity
- 6 out of 8 stream gages in Deerfield & Hoosic Rivers reach highest peaks of record
- Dubbed the "costliest Category 1 storm" ($15.8 billion in damages)
- Fed. Disaster: FEMA $5.6 million to MA households, $30 million for MA public assistance
- Fed. Highways: $46 million for roads and bridges, much of it for Rt 2

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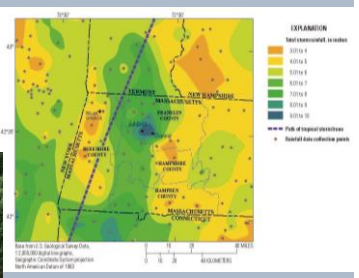
T.S. Irene and the Farmington River



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Irene @ Rt. 2 and Shelburne Falls

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Don't take Water for Granted

- Drought recurrence intervals may shorten
- Due to increased temp. and evaporation
- Lower groundwater recharge
- More water in summer/fall comes in extreme storm events with higher peak flows and more runoff
- Berkshires got off lightly this time

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Natural Hazards Evaluated

Hazards Evaluated	
Flood	Tornado
Dam Failure	Extreme Temperature
Hurricane / Tropical Storm	Drought
Nor'easter	Wildland Fire
Snow & Blizzard	Major Urban Fire
Ice Storm	Earthquake
Thunderstorm	Landslide
High Winds	Ice Jam
Beaver Activity	

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The Most Deadly Berkshire County Incidents

- **Hoosic River Floods**
  - 1938 -- Adams & North Adams – 2 deaths, many injuries
- **Dam failures**
  - 1886 -- Mud Pond Dam – Lee – 7 deaths
  - 1901 -- Basset/Dean's Dam – Adams – 1 death
  - 1968 -- Lee Lake Dam – Lee 2 deaths
- **Tornadoes**
  - 1973 -- W. Stockbridge – 4 deaths, 36 injured
  - 1995 -- Great Barrington – 3 killed, 24 injured

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Concerns around Sandisfield

- Flooding
- High/low elevation storms
- Accessing high elevations after storms
- Dams in poor condition
- Damage from beavers
- Dirt roads (total 53 miles) and tree maintenance
- Almost 9% of all roads in Sandisfield are in the floodplain

24

Assessing Vulnerability in Sandisfield

- Land use: 87% forest, 1.7% residential, 8.4% wetlands and water.
- About 5% of land in floodplain is developed (75 acres) (BRPC 2018)
- 5 large or intermediate dams are considered *High Hazard*
- 18 ice jams have been reported on West Branch of the Farmington river between 1915 and 2010 (a total of 41 in Berkshire County)

Buildings in Floodplain							
Residential No.	Percent	Commercial No.	Percent	Industrial No.	Percent	Total No.	Percent
86	14.1%	4	44.4%	1	25.0%	91	14.6%

Source: (Berkshire Regional Planning Commission, 2010)

Table 13. Tornados between 1950 and 2010

Date	Town	Property Damage	Category	Deaths / Injuries
7/12/1955	Sheffield	0	F2	0
10/3/1963	Cheshire	3,000	F1	0
3/1/1966	Adams	25,000	F2	0
8/11/1966	New Marlborough / Sandisfield	25,000	F2	0
6/18/1970	Williamstown / North Adams / Florida	250,000	F1	0
8/28/1973	West Stockbridge	25,000,000	F4	4/36
7/13/1975	Dalton	25,000	F2	0
7/27/1978	Sandisfield	0	F0	0
7/11/1984	North Adams	25,000	F1	0
5/29/1995	Egremont / Great Barrington / Monterey	250,000	F4	3/24
7/3/1997	Florida	15,000	F1	0
7/3/1997	Monterey	1,500,000	F2	0
7/3/1997	Otis	1,500,000	F2	0
7/3/1997	Richmond	50,000	F1	0
8/20/2004	Pittsfield	25,000	F0	0
6/29/2005	Great Barrington	0	F0	0
Total		28,693,000		7/60

Source: (NOAA, 2010)

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Are you Ready for Electricity Outages?

The energy sector's three major climate change concerns:

1. Flooding (increased precipitation, flooding)
2. Extreme events (hurricanes, snow, ice storms)
3. Increased temperature (demand surge, heat damage to distribution system)

One projection: household summer peak demands increase 3 fold from that of 1960-2000

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Are you Ready for Electricity Outages?

- **Do you know where vulnerable populations are that need electricity?**
  - Elderly (26% of Sandisfield pop. 65+ yrs*)
  - Medical needs like oxygen, dialysis
- **Do you know where to bring them for their needed services?**
- **Are you prepared to shelter residents in extreme cold and heat?**

** 2010 census*

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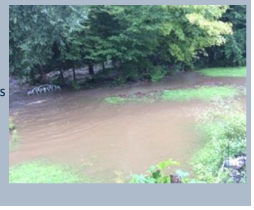
Where can we reasonably focus our Mitigation Efforts?

- **Flooding is our prime target**
  - Several hazards result in flooding (hurricanes, thunderstorms, snow, ice jams, dam failure)
  - Severe rain events cause localized flooding
  - Predictable boundaries (but needs adjustment)
  - Relative ease of implementing mitigation measures
  - Focus of grant programs
  - Local bylaws and zoning offer local control



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Examples of Mitigation Activities

- **Structural Projects**
  - Flood-proof, elevate or relocate buildings and infrastructure in floodplain or in flood zones
  - Armor infrastructure on bridges
  - Reduce road pavement widths *(narrowing 2 miles of road by 4' per lane can save $500,000 in reconstruction)*
  - Stream Crossing Standards = 1.2 X bank width
  - Maintain and/or improve drainage systems
    - Can we disconnect or re-route the pipe?

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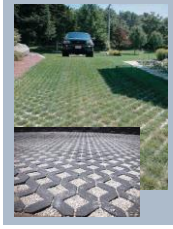
Examples of Mitigation Activities

- **Structural Improvements – Disconnect the Pipe**
  - Bioretention cells, swales, rain gardens, pervious pavers



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Examples of Mitigation Activities

- **Creative Development – Increase Infiltration**
  - Bioretention cells, swales, rain gardens

Photos: Horsley Witten Group, Inc.

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Permeable Pavement

Redevelopment: Parking Lots, Walkways

- Higher initial cost ($12/sf vs $5-7/sf)
- Reduces the amount of land needed for stormwater management
- Can infiltrate as much as 70-80% of annual rainfall
- Can reduce salt use by as much as 75%

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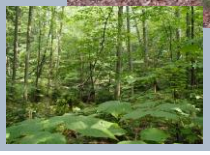
Examples of Mitigation Activities

- **Maintain Natural Cover on Building Lots**
  - Minimize disturbance of natural vegetation and soils
  - Maintain natural tree and shrub cover
    - *A mature evergreen intercepts up to 4,000 gal. of water per year*
    - *A mature deciduous tree intercepts 500-2,000 gal/yr*
  - Natural cover especially important in water supply overlay district



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Mitigation Policies

Guide Future Development –

- Floodplain bylaws
- Revisit zoning – does the town:
  - *Require that stormwater runoff be retained on site*
  - *Encourage Low Impact Development techniques*
  - *Restrict development on steep slopes*
  - *Have strong water protection overlay*

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Ongoing Monitoring

Incorporate New Data for Mitigation, Resilience, Adaptation

- Incorporate new floodplain data and boundaries when available
- Monitor data and climate change projections for infrastructure improvement projects

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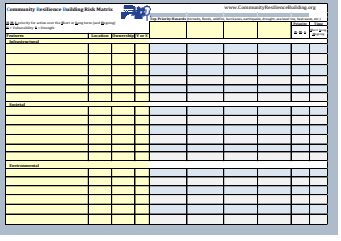
Now It's Your Turn

Identify the 4 Priority Hazards

- **Infrastructural:** municipal infrastructure, housing, utilities, commercial bldgs., municipal bldgs. and operations
- **Societal:** collective ability to respond – first responders, health services, goods and services
- **Environmental:** natural systems that protect, provide services or pose risk



Community Resilience Building Risk Matrix — www.CommunityResilienceBuilding.org

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The Nature Conservancy
nature.org
NOAA
Horsley Witten Group
Sustainable Environmental Solutions
SRPEDD
FEMA
Mass Audubon
Protecting the Nature of Massachusetts

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Natural Hazard Mitigation and Municipal Vulnerability Preparedness



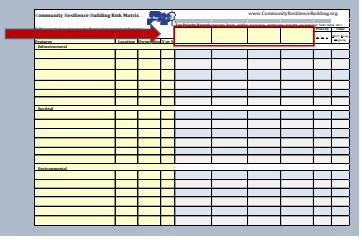
Town of Sandisfield
April 10, 2019

1

Last Week
Identify the 4 Priority Hazards

Top Priority Hazards Identified

- Flooding
- High Winds
- Ice/Snow Storms
- Extreme & Fluctuating Temperatures
- Heavy Rain



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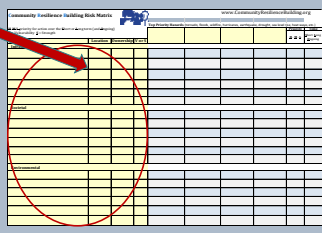
Last Week

Summary of Findings: Strengths and Vulnerabilities

- Sheltering in place during disasters and major storms (a strength with areas for improvement)
- Road maintenance is a major challenge directly affected by natural hazards, and create further challenges for emergency responders etc.
- Nursing home/rehabilitation center is an asset
- The natural environment of Sandisfield, including the forests, are a major asset to the community, and also poses challenges related to major weather events



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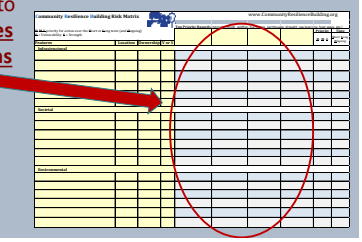
This Week
Identify the 4 Priority Hazards

Identify **actions** needed to **reduce the vulnerabilities** or **reinforce the strengths** represented by each feature/asset



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Examples of "Actions"

Infrastructure – Floodplain and zoning restrictions, pervious pavements, increasing sizes of culverts, assessing damns and bridges

Societal – Work with second home owners to get them better suites to "shelter in place", decide how to communicate with second home owners in emergencies, list of community members with additional needs

Environmental – Tree maintenance program for road sides, assess road salts getting into private owners wells

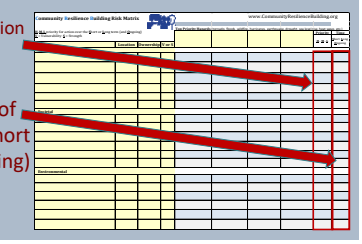
5

This Week

Identify the **priority** (high, medium, or low) of each action

AND

The **timeframe/urgency** of completing the action (short term, long term, or ongoing)



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Report Back to Full Group

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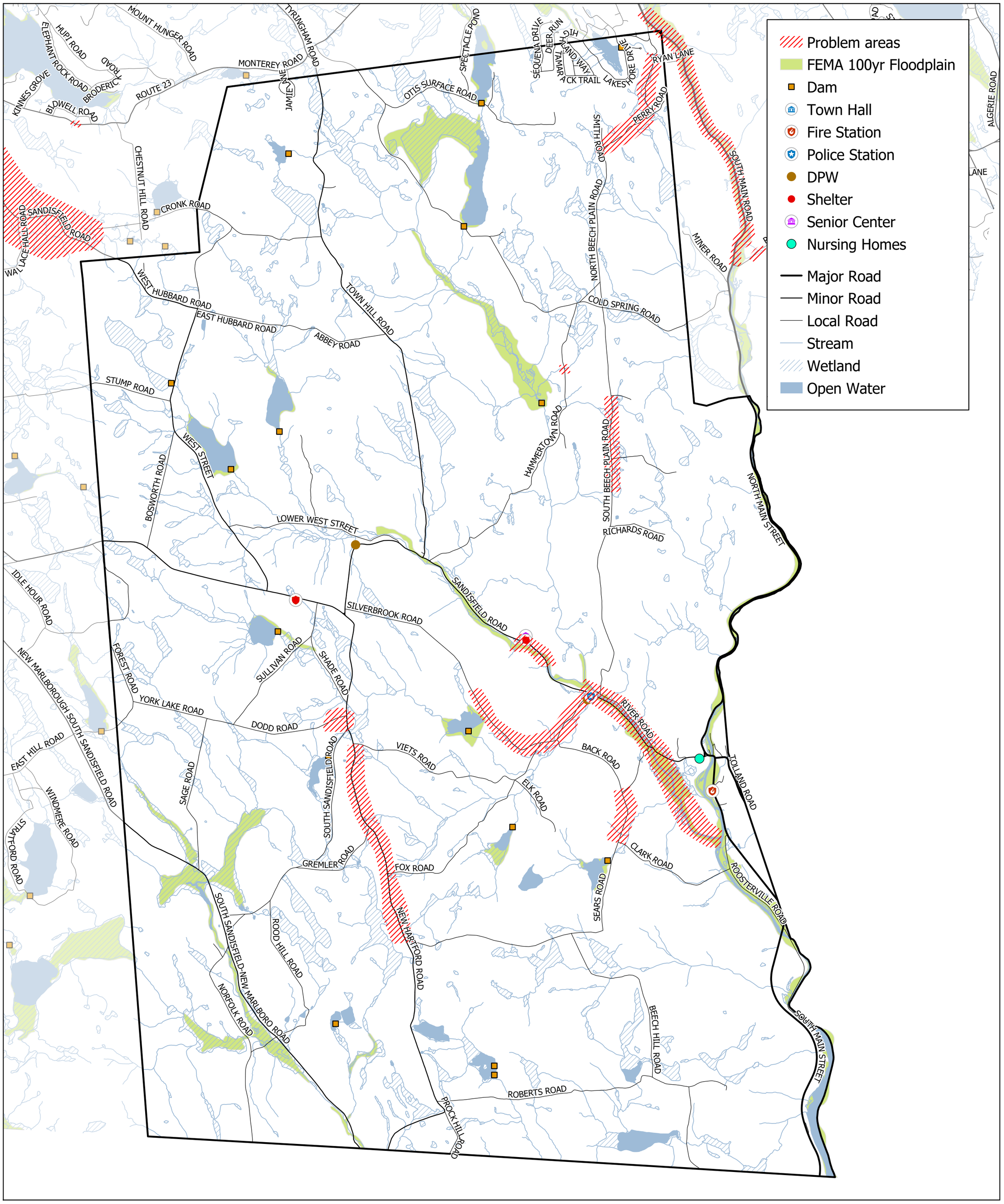
Please attend and invite others to the public session
April 29th, 2019 7:00 PM
Town Annex

8

Town of Sandisfield - Critical Facilities and Areas of Concern



0 0.5 1 Miles

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Berkshire Regional Planning Commission

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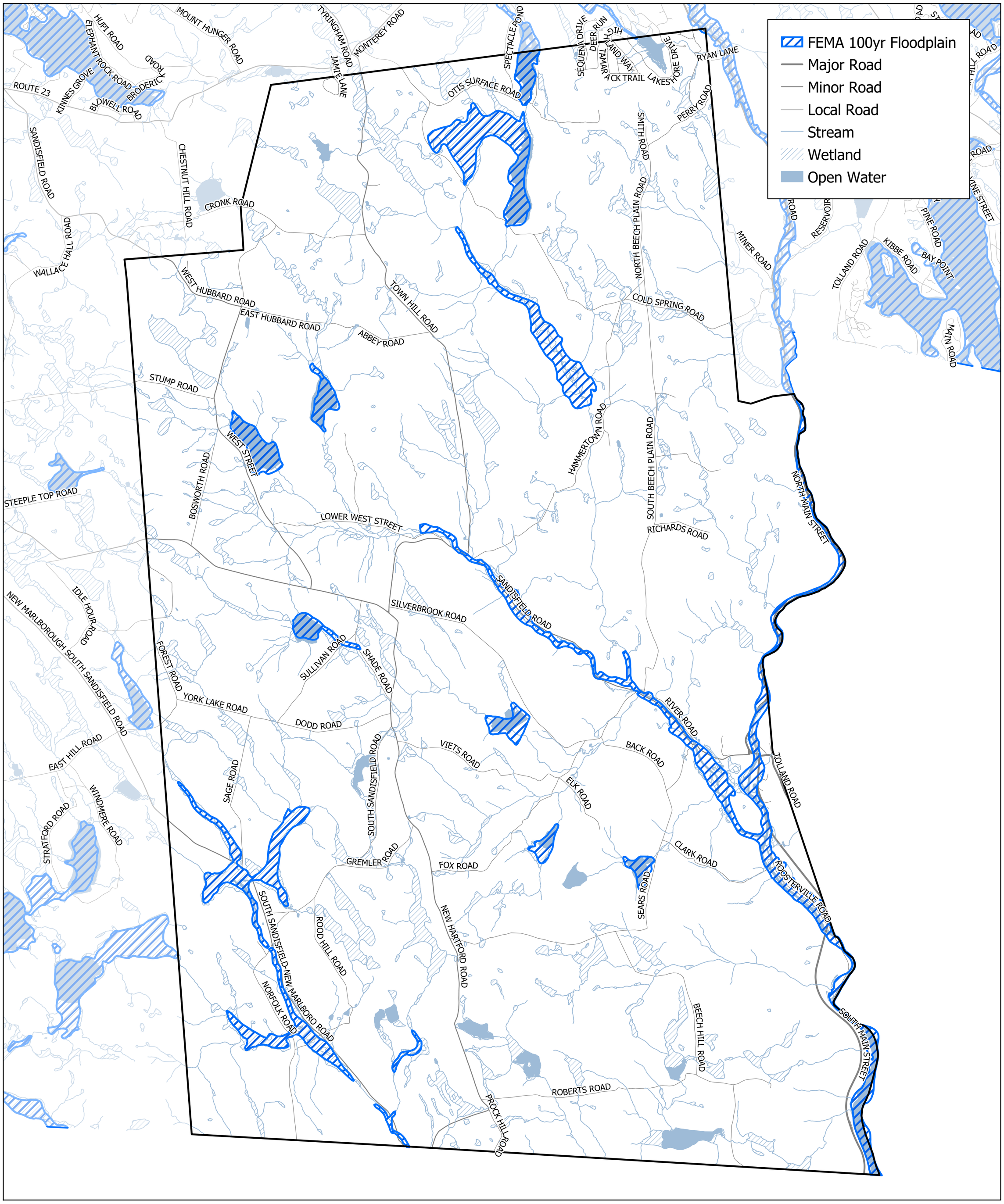
Town of Sandisfield - Floodplain



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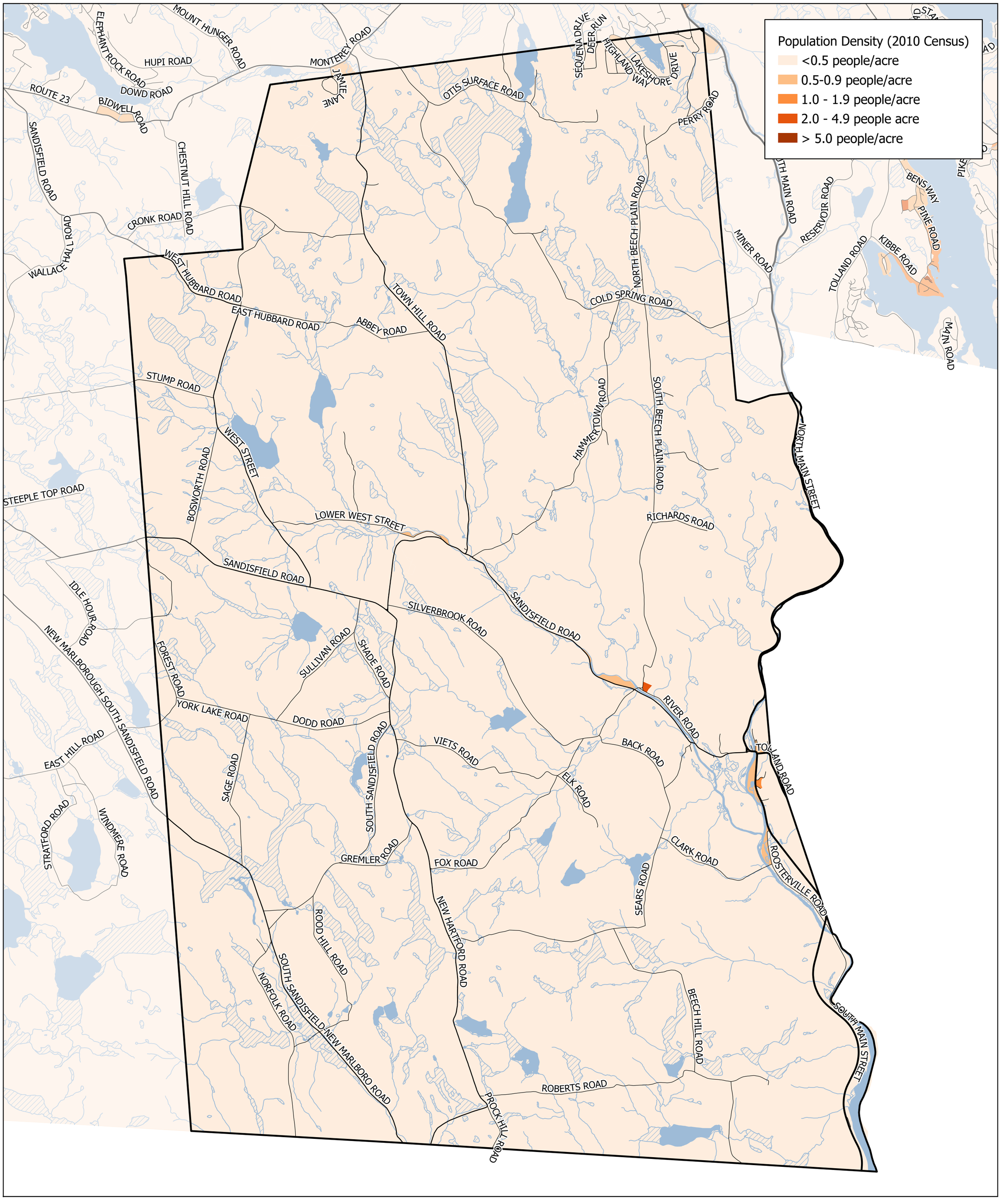
Town of Sandisfield - Population Density



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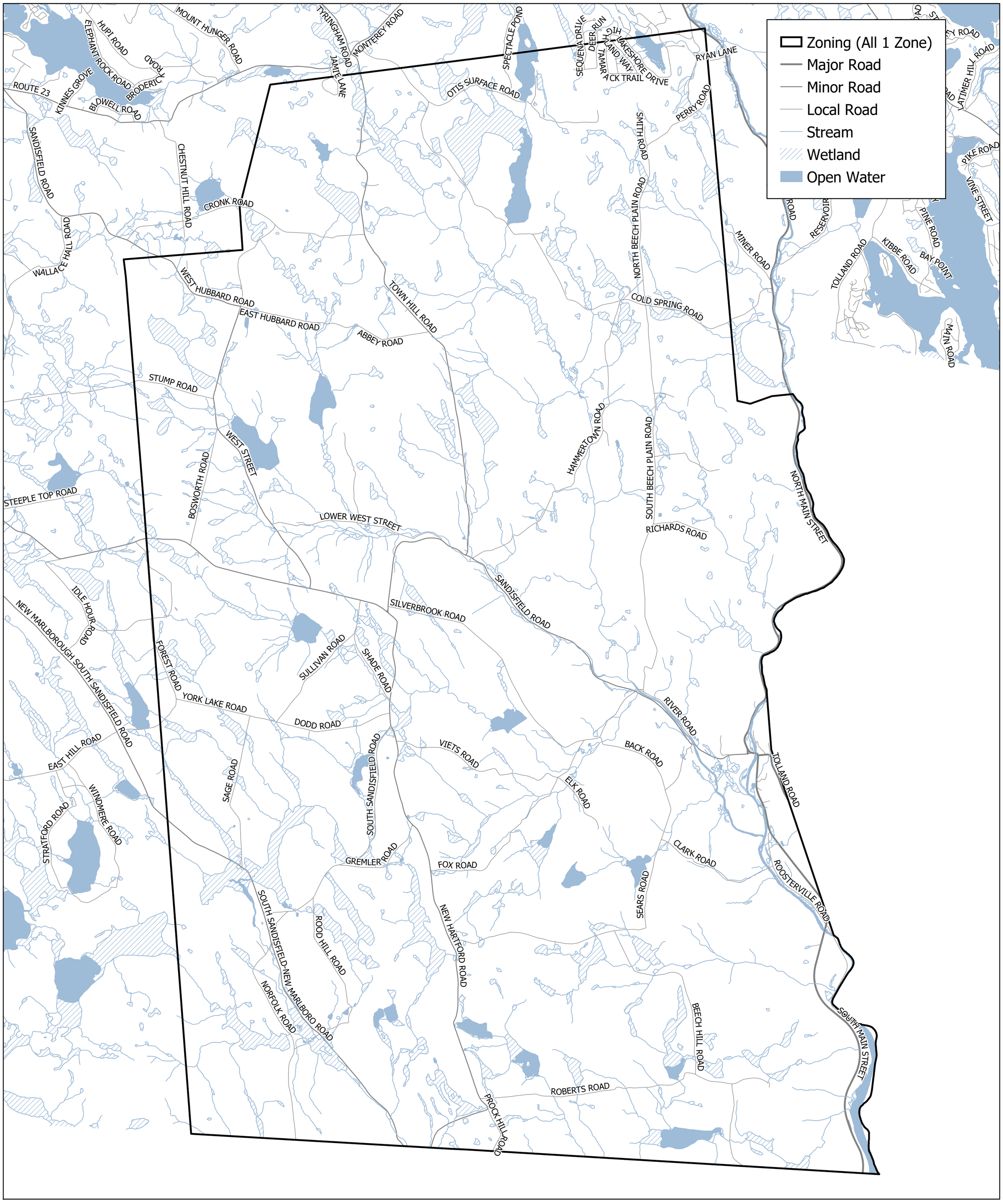
Town of Sandisfield - Zoning



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Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-M-L priority for action over the Short or Long term (and Ongoing)

V = Vulnerability S = Strength

Areas in Yellow suggested as Priority Actions by residents

Features	Location	Ownership	V or S	FLOODING	HIGH WINDS	SNOW&ICE STORMS	HEAVY RAINS	TEMPERATURE FLUCTUATIONS	Priority	Time
									H-M-L	Short Long Ongoing
Infrastructural										
Dodd Rd., Hammertown Rd.@Town Hill Rd. , Cold Spring Yard, New Hartford at Sullivan Shade Rd.,New Hartford nr.Crofut; all of Rte.57	Various - See Map	Town	V	1. Integrate nature-based solutions when possible with traditional infrastructure upgrades, including larger culverts, pipes, vegetated swales, etc. 2) Estab. Ongoing beaver monitoring w/aid of HO.; establish regular beaver maintenance procedures.					H	S-L-O
Unpaved roads inaccessible in winter - Abbey Rd., Cronk Rd.	Various	Town	V	Develop plan for upgrading unpaved roads; Dev. Ed campaign w/maps of safe routes; investigate innovative management solutions;					H	O
Streambank collapse; scouring on curves	Along Rte 57 and tributaries	Town/Pvt.	V	Share info with HO on bank stabilization with plantings as well as stone					M	O
Cell tower spotty coverage; lack of broadband; Short wave Radio antenna needs new repeater	Various	Town, Eversource, Verizon, Pvt	V	Support work of Broadband Committee to fulfill mission with MBI or other source; consider partnering to increase cell coverage					H	L
Town Library, private Homes and septic system flooding; 88 structures in floodplain	Various	Town, /Pvt.	V	Town Planning & ConComm to research/enact flood hazard zoning and conservation measures					H	O
No Local Shelter - warming/cooling only	Fire House#2	Town	V	Town leadership to investigate creation of new mixed-use Community Center					H	S
Code Red is Voluntary, not all-inclusive - How & Who to call during outages?	All	Town	V	Educational campaign using town website, mailer/brochures and news articles to educate residents on emergency planning/communications						
No Stores or Gas Station in Town for supplies - Plan ahead!	n/a	Pvt	V	Investigate ways to increase Town tax base using natural assets Enact policies to support/ attract new business and younger residents					H	O
Evacuation Routes in poor condition; often blocked	All	Town	V	Continue to lobby MA Legislative coalition for line item funding for Rte 57; Apply for CIP/other grants for improving roads					H	L
Pvt. wells vulnerable during dry seasons	Various	Pvt	V	Enact Water Conservation policies and educate HO on what to do during drought;						
Dams in poor condition	Various	Private/State	V	Write letter to Office of Dam safety, Evaluate dams						
Septic Systems at risk from flooding	Various	Pvt	V	Replace lawns with wet-tolerant woodland plantings; enact floodplain zoning						
Water through private wells only	Various	Pvt	V	Establish reliable backup water source; dry wells are insufficient						

Community Resilience Building Risk Matrix

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H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength
Areas in Yellow suggested as Priority Actions by residents

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	FLOODING	HIGH WINDS	SNOW&ICE STORMS	HEAVY RAINS	TEMPERATURE FLUCTUATIONS	Priority H-M-L	Time Short Long Ongoing
Societal										
Nursing & Rehab Facility	Sandisfield Rd.	Pvt	S	7 Day Shelter for up to 6 community members; update Town Emergency Mgmt plans to coordinate efforts					H	O
Second Homeowners and Airbnbs	Various	Pvt	V	Create educational campaigns to educate H.O & visitors, for emergency preparedness via town news outlets, map safe routes to shelter.					M	O
Residents Shelter In Place	Various	Town/Pvt.	S	Educate residents about Emergency prep kits for storm events; Work w/COA, EMD, Police & Fire					H	S
Town Budget impacts: Road Repair; State lands and Bedroom community - impacts tax base	Various	Town	V	Investigate other ways of recouping tax revenue for state and Ch61 lands, including additional taxes related to road use, etc.					H	L
Residents "Trapped" during Storm events	Various	Town/Pvt.	V	Develop a "buddy system" in town, especially for people with medical issues. Survey & develop list of people who need assistance.					H	S-O
Pvt homes & Town Library in floodplain	Various	Pvt	V	Provide info to property owners on using green methods and plantings to control floodwater, protect wells/septic					M	O
No grocery stores in town	Various	Pvt	V	Attract new business to Town - store/convenience/gas station. Explore possible incentive program or Co-Op					H	O
Mutual Aid is good - build its strengths	Various	Town	S/V	Recruit more volunteers to serve in town especially for ambulance/fire & rescue					H	S
Lack of community center	Rte.8?	Town	V	Build support for development of a community center that will have multiple uses, including sheltering, library, and COA					H	S
Loss of young population	Various	Town/Pvt.	V	Consider Economic develop't and promoting Sandisfield as a good place to live. High speed internet is needed.					M	O

Community Resilience Building Risk Matrix

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H-M-L priority for action over the Short or Long term (and Ongoing)

V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Flooding	High Winds	Snow and Ice Storms	Heavy Rain Temperature Fluctuations	Priority H-M-L	Time Short Long Ongoing
Environmental									
Trees & Limbs falling onto Roads & Buildings; Canopy is aging and at risk from insect infestation	Various	Town/Pvt.	V or S	Develop a list of equipment for the town that would make clearing sides of roads easier for town DPW. Apply for funding of equip.				H	L
Risk of Fire in Drought seasons	Various	Town/Pvt.	V	Dead trees should be cleaned up to prevent fires. Rent a chipper once a year and reuse chips/allow residents to take as needed.				M	O
Increased turbidity in lakes, ponds, rivers, streams	Various	Town/Pvt.	V	Conduct green restoration for streams, rivers, and bodies of water. Ask state for assistance.				M	L
Ample surface water bodies	Various	Town/Pvt.	S	Develop a fishing map, advertise tourism and new homeowner opportunities				M	O
Tree crowns compromised during storms	Various	Town/Pvt.	V	Increase forest management -- create or update Forestry plan w/Tree Warden, State				H	L
Clay soils in parts of town - no perc	New Boston	Town/Pvt.	V	Soil stabilization program. Materials such as gravel and magnesium can help stabilize soil when mixed.				H	O
Beaver activity	Various	Town/Pvt.	V	Explore options for beaver management program.				H	O
Farmington River provides recreational asset	Eastern border	State	S	Promote use of the Farmington for kayaking, fishing, and more to increase tourism.				M	O
Salt from roads impacting well water quality	Rte.57	Town/Pvt.	V	Study vegetation that bioremediates salt along roads. Consider salt alternatives and try them.				M	O
State borders "invisible" - regional response/cooperation	Southern border	Town	S	Talk to neighboring towns in B.Cty, CT and in Hampden Cty. to strengthen bonds/cooperation/share best practices				M	O
Tight knit community - good social network	Various	Town	S	Create a "buddy system" or build existing networks to make sure people stay in touch and are contacted before/during storm emergencies				M	O

CLIMATE CHANGE OBSERVATIONS

The Basics for the Berkshires

Key Observed Climate Changes in MA

Temperature: 2.8°F (7-10°F by 2100) Since 1895

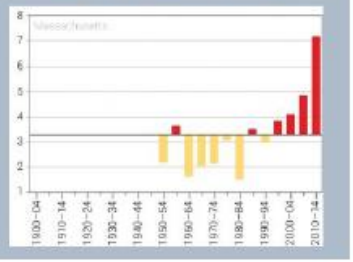
Growing Season: 10 Days Since 1950

Strong Storms: 71% Since 1958

- Warmer Temperatures –
  - More evaporation, less soil moisture, increased risk for fire, drought, human health risks (particularly for elderly, other vulnerable pops.)
  - Greater temp. increases in winter
    - Less snow, but still cycles of freezing temperatures = infrastructure vulnerability
    - Rain-on-Snow = more overland winter flooding, ice jams
  - Increased temps. = increased heat stress for people, livestock, wildlife
  - Great evening temps. = inability for people and homes to cool down and "catch up" to normal temps.
  - Increased risk of thunderstorms and other severe rain events
  - New and expanding pests: ticks, mosquitos, forest and crops
  - Increased growing season
    - Pros: new farming opportunities
    - Cons: increased allergen season and increased potency

Observed Number of Warm Nights

• Number of Nights where min. temp. > 70° F

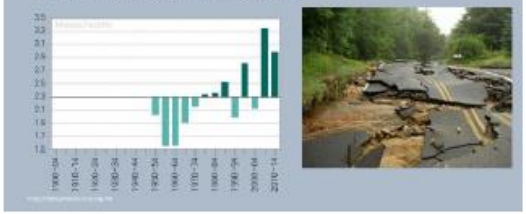


Precipitation Trends

- Increase in Extreme Rain Events = increased risks and damages to municipal infrastructure
- Engineering Standards -- engineers now directed to use new data sets that include post-1970s precipitation data

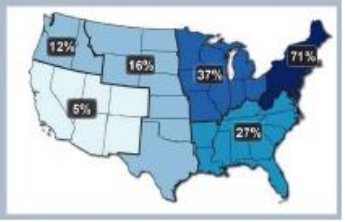
Observed No. Extreme Precip. Events

• Number of Events w/ Precip. > 2" in 1 day



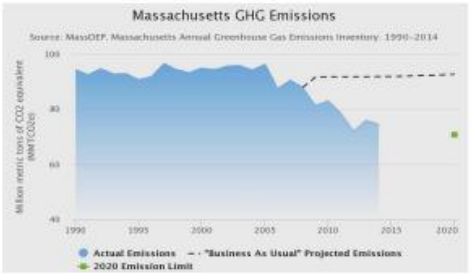
More Extreme Precipitation

71% Observed 1958-2012



MA Energy Reduction – Success

MA GHG Emissions dropped 21% while Gross State Product increased 70% in same time period



Reconsider Floodplain Development

Berkshire County floodplain maps are from the 1980s

- Urban Infill Example
  new residential building on corner lot, outside of 100-yr floodplain

- New FEMA floodplain Study
  new building now inside floodplain recharge

- Same building
  March 2010 flood
  (approx. 40-year flood)

A Last Thought

Pity the Snowshoe Hare
December 2012

Its instinct is to sit still when danger approaches, thinking it blends in with its surroundings .

Centuries ago, even decades ago, there would likely be some snow cover to provide camouflage for this species.

Humans have the ability to adapt, unlike our hare.

TROPICAL STORM IRENE: an inland storm of reference for the Berkshires

The Basics

- Tropical Storm (39-73 mph) hit the Berkshires August 28-29
- Eye of the storm travels over Berkshires approx. winds of ~50 mph
- “Catastrophic floods” in NYS and New England, with rain totals of 5”-10” in Western Mass., 7”-10”+ in VT and NYS; this rain fell on already saturated soils from previous rainstorm events
- Devastating flash flooding across mountain valleys ranking second worst in history; entire villages in Catskills uninhabitable and VT residents stranded for days by washed out bridges and roads; 500,000+ MA residents without electricity
- 6 out of 8 stream gages in Deerfield & Hoosic Rivers reach highest peaks of record
- Calculated as >100-year but <500-year flood in Hoosic River
- 50-year storm (2% chance flood event) in central Berkshire County
- Roads washed out, bridges damaged or washed out across many towns in Berkshire County; Rt. 2 is closed for 3 ½ months for repairs
- Dubbed the “costliest Category 1 storm” ($15.8 billion in damages)
- Fed. Disaster DR 4028: FEMA $5.6 million to households, $30 million for public assistance
- Fed. Highways: $46 million for roads and bridges, cost $23 million o repair 6 miles of Rt 2

Rain Totals

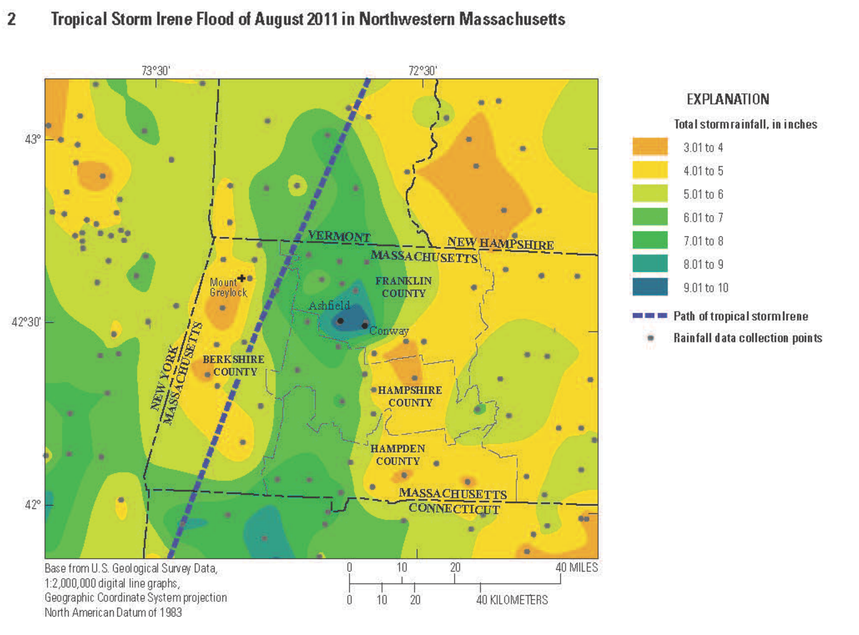
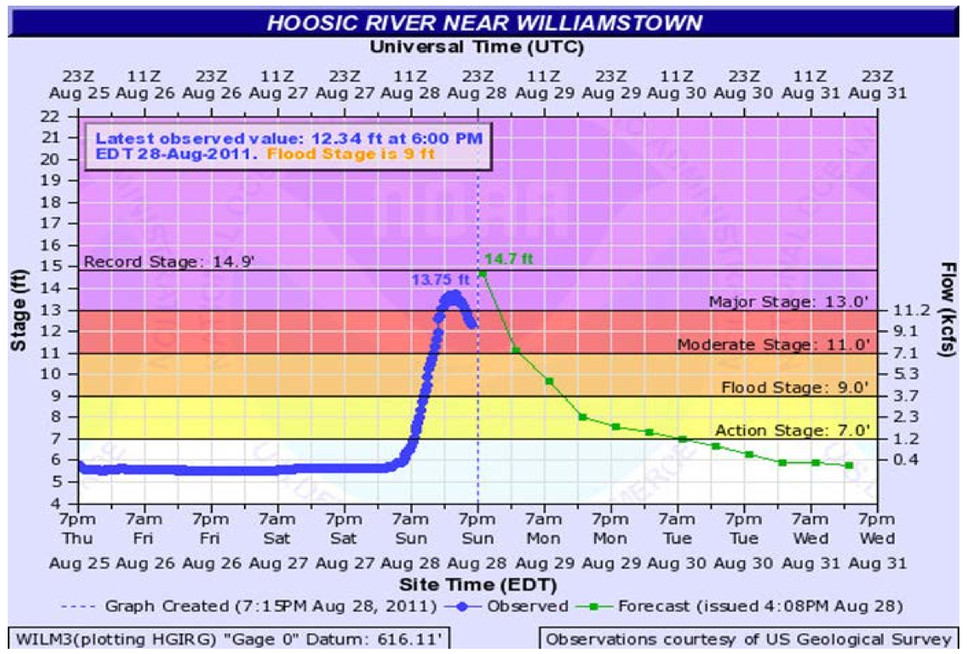


Figure 1. Distribution of rainfall and path of tropical storm Irene across western Massachusetts on August 28–29, 2011. Information on the rainfall data collection points and the path of tropical storm Irene is from the National Oceanic and Atmospheric Administration (2011) and National Weather Service (2011).

Raging Rivers and Streams



T.S. Irene estimated to be near or more than the 100-yr storm along the Hoosic River

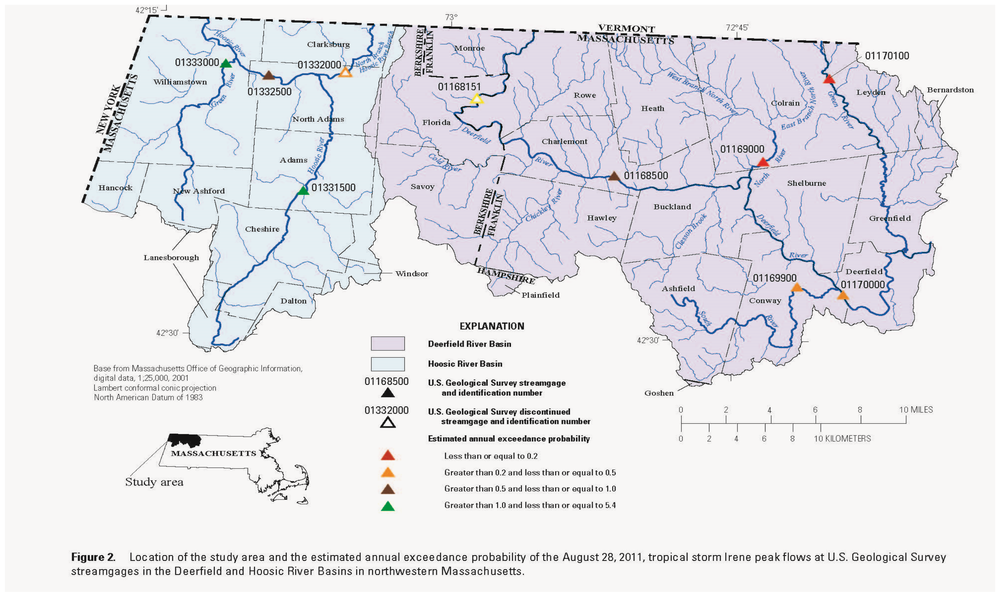


Figure 2. Location of the study area and the estimated annual exceedance probability of the August 28, 2011, tropical storm Irene peak flows at U.S. Geological Survey streamgages in the Deerfield and Hoosic River Basins in northwestern Massachusetts.

Shelburne Falls

Deerfield River in Shelburne Falls flowed at 30,000 cubic feet per second – 40 times normal flow

Left – Bridge of Flowers during storm and under normal conditions.

Below – Bridge Street bridge – critical link to town

The Spruces, Williamstown

- Building and health inspectors declare 75% of homes uninhabitable
- If >50% of home value is damaged, current building codes must be met
- If FEMA funds used to repair or replace homes it must be elevated 6’–10’ above floodplain elevation + additional 2’ clearance; this requires that some homes to be placed 12’ above ground level
- Residents in all 225 mobile home units permanently displaced

Route 2 and Green River Dam

Left: Historic covered bridge in Greenfield damaged by dam failure upstream

Right, below: Rt. 2 road collapse and landslide along Cold River in Florida & Charlemont

Dalton – 50-year storm

Evacuations at Pomeroy Manor and risks to water, sewer, gas lines on Main St Bridge

OPPORTUNITIES TO REDUCE RISK – LAND DEVELOPMENT TECHNIQUES

Land Use Policies

Guide Future Development

- Strictly enforce floodplain bylaws and wetlands protection to maintain flood storage resiliency
- Revisit zoning – does the town:
  - *Require that stormwater runoff be retained on site*
  - *Encourage Low Impact Development techniques that minimize land disturbance and maximizes the site's natural landscape*
  - *Concentrate development and maintain open natural landscapes for connectivity*
  - *Restrict development on steep slopes*

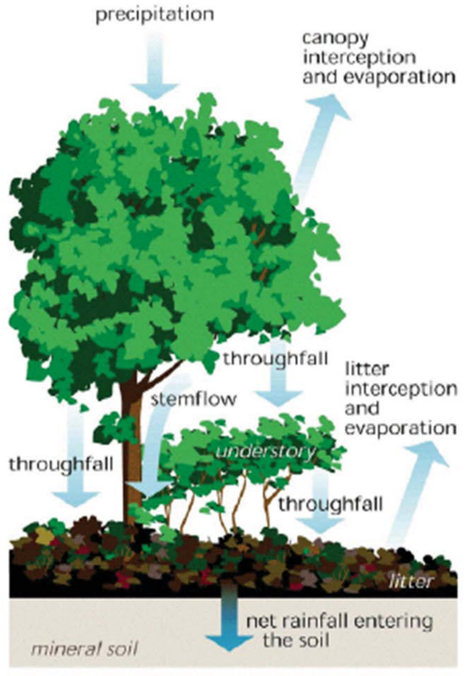
Incorporate New Data for Mitigation, Resilience, Adaptation

- Incorporate new floodplain boundaries when available – new floodplain data is available for the Hoosic River
- Monitor data and climate change projections

Develop Carefully

Maintain the Natural Landscape

- A mature deciduous tree intercepts 500-2,000 gallons of water per year.
- A mature evergreen intercepts up to 4,000 gallons / yr.
- Root systems of trees and understory hold soil in place.
- Natural cover is particularly important on steep slopes, such as those that surround the town center.



Disconnect the Pipe

- **Reduce the amount of hard, impervious surface areas like homes, parking lots and buildings**
- **Capture the runoff that IS created rather than pipe it into a storm drain system – which discharges into the nearest waterway (accelerated, higher peak flows)**

<u>Left:</u> Reduce pavement, capture runoff in rain gardens, biorentention cells

<u>Below:</u>

Capture roof runoff in rain gardens

Infiltrate More - Pervious Pavers and Pavement

Pavers allow infiltration while providing structure for cars

Pervious Pavement for Parking and Walkways

- Higher initial cost, but:
- Reduces land needed for retention ponds and other management
- Can infiltrate as much at 70-80% of rainfall
- Can reduce salt use by up to 75%
- Not for use where sand is applied in winter

Appendix B – April 29, 2019 Public Forum Materials

Workshop Information Handout

Infrastructure, Societal, and Environmental Voting Matrices

Overview of Summary of Findings

Purpose, Intent, Objectives, and Outcomes of Workshop Process:

There is an increasing need for municipalities to expand their resilience and adapt to extreme weather events and natural hazards. The Town of Sandisfield, MA has experienced more intense and frequent storm events leading to flooding of roads, damage to critical infrastructure and private properties, as well as endured prolonged power outages, wind storms, nor-easters, and winter ice storms.

In 2018, the Town received funding from the MA Executive Office of Energy and Environmental Affairs (EOEEA), and began the process of conducting a Municipal Vulnerability Preparedness (MVP) assessment with the Town Administrator, Fred Ventresco, as the lead. The Town formed a MVP Committee with the Emergency Management Director, John Burrows, as its Chairperson. The Town was assisted by the Berkshire Regional Planning Commission, a state-certified MVP provider, to assist with the planning and outreach process, using the Community Resilience Building (CRB) Workshop process and methodology as a guide.

MVP Workshops were held on two Wednesday evenings, April 3rd and 10th, and included stakeholders such as town officials, town department staff, first responders, residents, respected elders, and business owners, all whom provided unique details about the impact sever weather has had in Sandisfield.

Objectives of the Workshop:

- Define top weather and related hazards in Sandisfield
- Identify existing Town strengths and vulnerabilities
- Develop a detailed list of suggested Actions to protect infrastructural, societal, and environmental vulnerabilities
- Identify opportunities to increase resilience and reduce the weather-related hazards of life, property and the environment, both in the short and long term.

The Top Hazards Identified in the Workshop were:

1. Flooding
2. High Winds
3. Ice/Snow Storms
4. Extreme or Fluctuating Temperatures
5. Heavy Rain

Areas of Most Concern are as follows:

INFRASTRUCTURE:

- Roads, culverts, and bridges around Sandisfield that flood repeatedly, including Sandisfield Road/Rte.57, Dodd Road, Hammertown Road, Cold Spring Yard, and more.
- Flooding of public and private properties, especially flooded basements and on private properties that have lost acreage through stream-bank collapses or river scowering, especially in the New Boston Neighborhood.
- Dams, both state-owned and private flood control dams are in poor shape.
- Emergency Communications Infrastructure. Landlines and Cellular systems do not provide complete coverage, making emergency communications difficult during a power outage. There is not reliable radio communication infrastructure for first responders.

SOCIETAL:

- Seasonal and Vulnerable Populations, including elder residents, medically vulnerable persons, and seasonal visitors are most at risk during disasters.
- Emergency Management and Sheltering Capability – shelter in place is the preferred solution, however, in the event that many people had to be sheltered for an extended period of time, there is currently no location in Sandisfield with enough capacity. In addition, there is no grocery or general store or gas station in Sandisfield where residents can “stock up” before a major storm.
- Public communication and education about natural hazard issues should be conducted throughout town.

ENVIRONMENT:

- Environmental integrity was a main concern. The increase in severe weather has caused a heavy use of road salt and sand that wash into streams. Heavy rain causes erosion, riverbank scouring, and increased turbidity in Sandisfield’s surface waters, particularly in streams that reach the Farmington River.
- Forest monitoring and management efforts should be continued.
- Fluctuating temperatures have exacerbated the tick and mosquito populations in recent years. The threat from tick and mosquito borne illnesses is on the rise county-wide.

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

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

FLOODING	HIGH WINDS	ICE + SNOW STORMS	TEMPERATURE EXTREMES/ FLUCTUATIONS	HEAVY RAIN	

Features	Location	Ownership	V or S	
Infrastructural				
Dodd Rd., Hammertown Rd.@Town Hill Rd. , Cold Spring Yard, New Hartford at Sullivan Shade Rd.,New Hartford nr.Crowfoot; all of Rte.57	Various - See Map	Town	V	1. Integrate nature-based solutions when possible with traditional infrastructure upgrades, including larger culverts, pipes, vegetat swales, etc. 2) Estab. Ongoing beaver montoring w/aid of HO.; establish regular beaver maintenance procedures.
Unpaved roads inaccessible in winter - Abbey Rd., Cronk Rd.	Various	Town	V	Develop plan for upgrading unpaved roads; Dev. Ed campaign w/maps of safe routes; investigate innovative management solutions;
Streambank collapse; Scouring	Along Rte 57 and	Town/Pvt.	V	Share info with HO on bank stabilization with plantings as well as stone
Cell tower spotty coverage; lack of broadband; Short wave Radio antenna needs new repeater	Various	Town, Eversource, Verizon, Pvt	V	Support work of Broadband Committee to fulfill mission with MBI or other source; consider partnering to increase cell coverage
Town library, private Homes and septic system flooding; 88 structures in floodplain	Various	Town, /Pvt.	V	Town Planning & ConComm to research/enact flood hazard zoning and conservation measures
No Local Shelter - warming/cooling only	Fire House	Town	V	Town leadership to investigate creation of new mixed-use Community Center
Code Red is Voluntary, not all-inclusive - How & Who to call during outages?	All	Town	V	Educational campaign using town website, mailer/brochures and news articles to educate residents on emergency planning/commu
No Stores or Gas Station in Town for supplies - Plan ahead!	n/a	Pvt	V	Investigate ways to increase Town tax base using natural assets enact policies to support/ attract new business and younger reside
Evacuation Routes in poor condition; often blocked	All	Town	V	Continue to lobby MA Legislative coalition for line item funding for Rte 57; Apply for CIP/other grants for improving roads
Pvt. wells vulnerable during dry seasons	Various	Pvt	V	Enact Water Conservation policies and educate HO on what to do during drought;
Dams in poor condition	Various	Private/State	V	Build public support for creation of new multi-purpose community center
Septic Systems at risk from flooding	Various	Pvt	V	Replace lawns with wet-tolerant woodland plantings; enact floodplain zoning
Water through private wells only	Various	Pvt	V	Establish reliable backup water source; dry wells are insufficient

ommunity Resilience Building Risk Matrix

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M-L priority for action over the Short or Long term (and Ongoing)
= Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

FLOOD-ING	High Winds	Ice + Snow	Extreme Temperatures/ Fluctuations	Heavy Rain

atures / Societal	Location	Ownership	V or S	
ursing & Rehab Facility	Sandisfield Rd.	Pvt	S	7 Day Shelter for up to 6 community members
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esidents Shelter In Place	Various	Town/Pvt.	S	Educate residents about necessary shelter in place items. work directly with COA. Consider providing some kits for residents
Town Budget impacts: Road Repair; State lands and Bedroom community - impacts tax base	Various	Town	V	Investigate other ways of recouperating the loss tax money, including additional taxes related to road use, etc.
Residents "Trapped" during Storm events	Various	Town/Pvt.	V	Develop a "buddy system" in town, especially for people with medical issues. Potentially develop list of people who need assis
Pvt homes & Town Library in floodplain	Various	Pvt	V	Correate requirements/suggestions fprivate home owners and other building owners to use green infrastructure when renova
No grocery stores in town			V	Attract someone to open store/convenience/gas station. Explore possible incentive program.
Mutual Aid is good - build its strengths	Various	Town	S/V	Recruit more volunteers to serve in town
Loss of young population	Various	Town/Pvt.	V	Consider developing and promoting a neighbor to neighbor program. high speed internet.