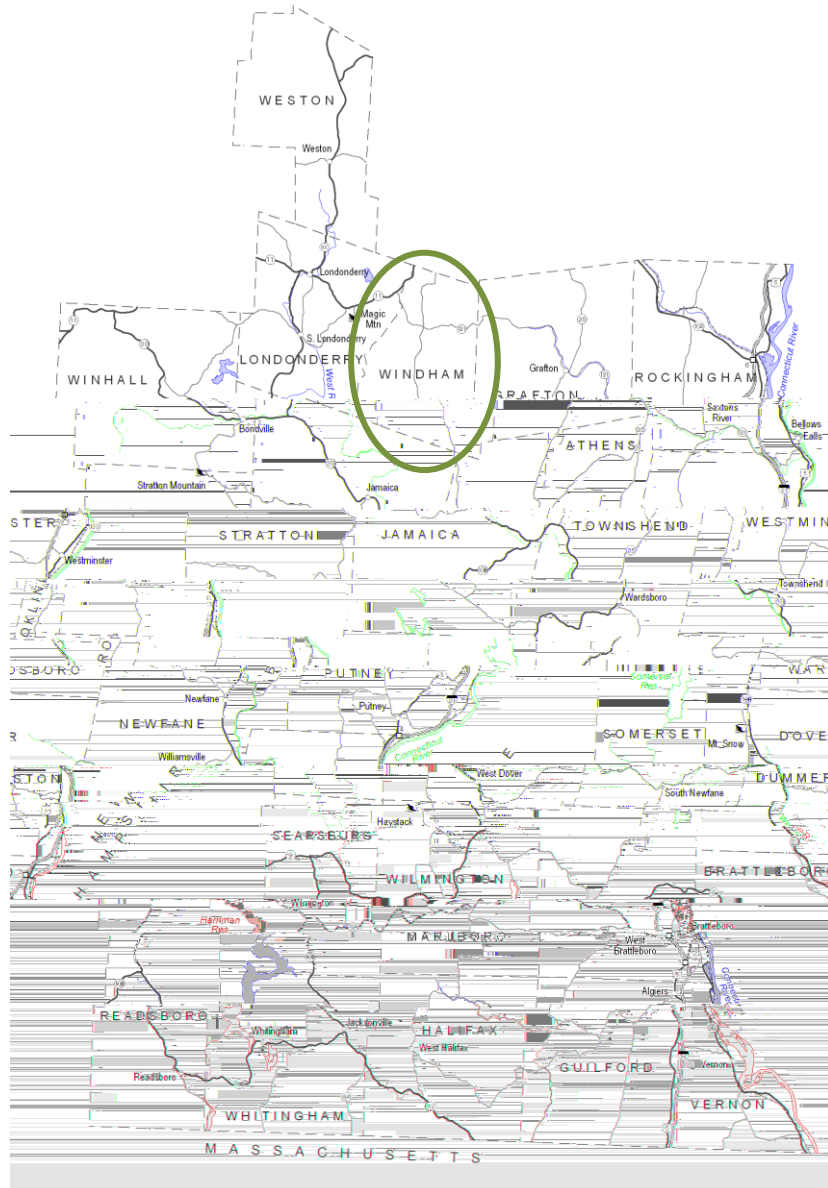


# Town of Windham, Vermont Local Hazard Mitigation Plan



**Adopted 11/2/15, FEMA Final Approved 11/19/15**

**Prepared for the Town of Windham by  
the Windham Regional Commission**



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## I. INTRODUCTION AND PURPOSE

**This Single Jurisdiction Hazard Mitigation Plan is an update to a FEMA approved and town adopted annex to the Windham Region Multi-Jurisdiction All Hazard Mitigation Plan that expired on December 5, 2012.** The town has decided to update to a Single Jurisdiction Plan.

The purpose of this plan is to assist the Town of Windham in identifying all of the natural hazard vulnerabilities facing the town and to identify new and continuing strategies to reduce risks from identified hazards.

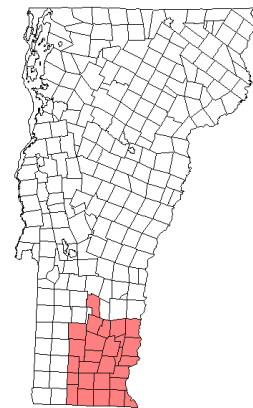
Hazard mitigation is any sustained action that reduces or eliminates risk to people and property from natural and human-caused hazards and their effects. Based on the results of previous Project Impact efforts, FEMA and state agencies have come to recognize that it is less expensive to prevent damage from disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities also have opportunities to identify mitigation strategies and measures during all of the other phases of Emergency Management – preparedness, response and recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where the hazards are most severe and identify what local actions that can be taken to reduce the severity of hazard related damage.

Hazard mitigation strategies and measures alter the hazard by: eliminating or reducing the frequency of occurrence; lowering long term risk; averting the hazard by redirecting the impact by means of a structure or land treatment; adapting to the hazard by modifying structures or standards; or avoiding the hazard by stopping or limiting development. Mitigation could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying and modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Planning for land use for floodplains and other flood-prone areas
- Proper road maintenance and construction
- Ensuring critical facilities are safely located
- Establishing and enforcing appropriate building codes
- Public information

## II. WINDHAM REGION OVERVIEW

Situated in Vermont's southeastern corner, the Windham Region consists of 23 towns in Windham County, the neighboring towns of Readsboro, Searsburg, and Winhall in Bennington County, and Weston in Windsor County. The region is bordered by Massachusetts to the south and New Hampshire to the east. At over 920 square miles (590,000 acres), the region accounts for roughly 9.6% of the State's total



land area. The Windham Region has several distinctive identities, largely defined by the diverse natural environment.

The Region's topography is relatively flat or gently rolling land in the Connecticut River valley in the east, while the western part of the region is characterized by the Green Mountain ridges and peaks with narrow stream valleys. Stratton Mountain is the highest point in the region at 3,936 feet. The lowest point is along the Connecticut River in Vernon, at 200 feet.

In addition to the Connecticut, other major rivers of the region are the Deerfield, Green, North, Saxtons, West, and Williams, all tributaries of the Connecticut. There are two major flood control reservoirs on the West River, Ball Mountain and Townshend, and two major storage reservoirs for hydropower generation on the Deerfield River, Somerset and Harriman.

### III. TOWN PROFILE

#### Geography and Transportation

The Town of Windham covers approximately 38 square miles in the Upper Valley of the Saxton's River Watershed area of Windham County. The Town is located in a north/south orientation, between Route 11 to the Northwest and Route 30 to the South. Windham can be reached from Windham Hill Road which connects with Route 30 in West Townshend; Route 121 which runs east/west through Town and connects Windham with its neighbors Grafton and Londonderry; and from a small section of State Highway 11 which runs through the northwest corner of Town. The major entry and exit routes are steep inclines, rising to the Town center. The Town is at a relatively high elevation (all of Windham is above 1,500 feet) but

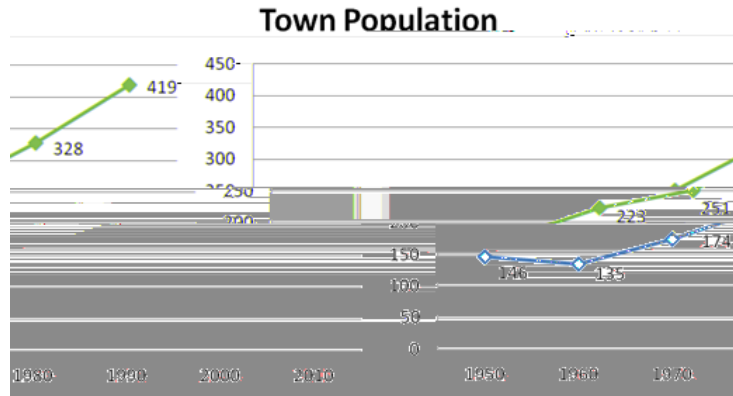


even so, the surrounding areas to the east and west of the Town centers are still at higher elevations, with settlement concentrated in the "valley" running north and south. Glebe Mountain defines the western region of Windham. The topography of the Town does not lend itself to heavy through-traffic, nor does it attract large commercial or industrial development.

#### Demographics and Growth Potential

The Town ranks as the fourth smallest town in the Windham Region. The 2010 US Census reported Windham with a population of 419 residents. After experiencing a decrease of over 50% during the first half of the 20th Century, Windham began to experience population growth. From 1970-2010, Windham's population has more than doubled (see figures on the next page).

Town of Windham Population Growth: 1950-2010:



Population Trends in Windham and Surrounding Towns:

Town	1990	2000	2010	% Change 1990-2000	% Change 2000-2010
Windham	251	328	419	31%	28%
Londonderry	1,506	1,709	1,769	14%	4%
Jamaica	754	946	1,035	26%	9%
Townshend	1,019	1,149	1,232	13%	7%
Grafton	602	649	679	8%	5%
Andover	3,026	3,210	3,178	6%	-1%

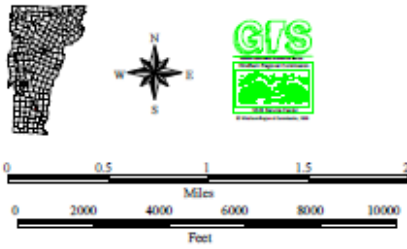
It should be noted that from 2000 to 2010 Windham’s actual population growth was from 328 to 419, an increase of 28%. The decade from 1990 to 2000 had growth of 31%. In the absence of any real change in the commercial or industrial profile of the community over those 20 years, this cannot be considered the result of economic development. The fact is that Windham has attracted this growth by virtue of its quiet and pristine rural beauty. The growth has been due to a fairly constant trend of seasonal homeowners becoming full time residents and to new landowners building permanent homes.

Land Use and Development Patterns

Recent development in Windham has been overwhelmingly residential in nature. Most of this residential development is located along Windham Hill Road or on unpaved secondary roads. It is generally characterized as scattered, low density single family development. There are pockets of more dense residential uses in Windham Center, South Windham and near the former Timberside Ski Area. Because residential properties in Windham do not have public sewer systems, residences tend to be located where soils are more suitable for individual wastewater disposal systems. The existing land use map is shown on the following page.

# Existing Land Use/Land Cover Windham, VT

NOTES:  
 - This map should be used for planning purposes and general reference only.  
 - A large scale color reference of this map is available at the Windham Town Office.



▲ Church  
 ■ School  
 ■ Residence, Public Building  
 □ Barn/Outbuilding

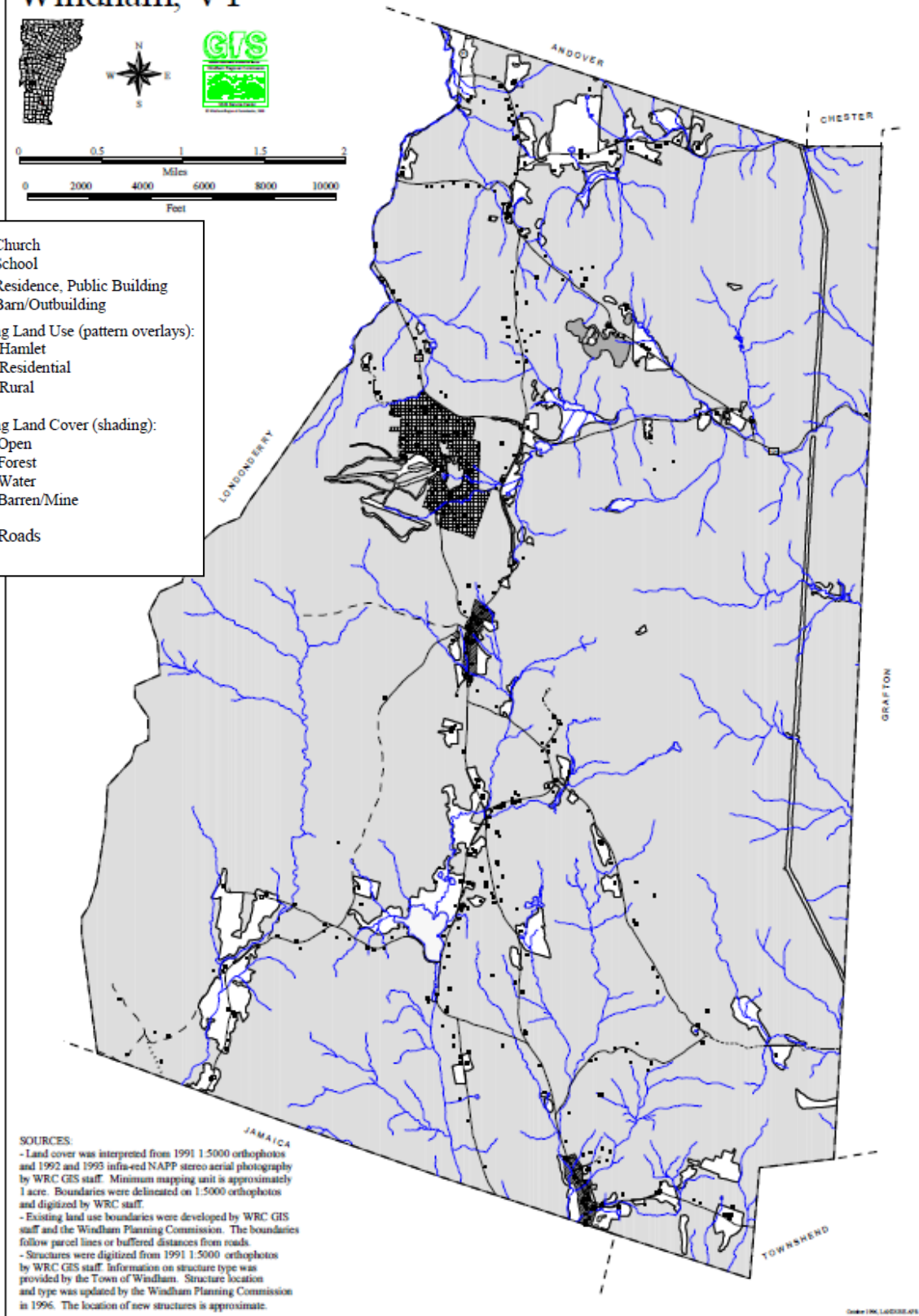
Existing Land Use (pattern overlays):

- Hamlet
- Residential
- no pattern Rural

Existing Land Cover (shading):

- Open
- Forest
- Water
- Barren/Mine

Roads



SOURCES:  
 - Land cover was interpreted from 1991 1:5000 orthophotos and 1992 and 1993 infra-red NAPP stereo aerial photography by WRC GIS staff. Minimum mapping unit is approximately 1 acre. Boundaries were delineated on 1:5000 orthophotos and digitized by WRC staff.  
 - Existing land use boundaries were developed by WRC GIS staff and the Windham Planning Commission. The boundaries follow parcel lines or buffered distances from roads.  
 - Structures were digitized from 1991 1:5000 orthophotos by WRC GIS staff. Information on structure type was provided by the Town of Windham. Structure location and type was updated by the Windham Planning Commission in 1996. The location of new structures is approximate.

Scale 1/8" = 1,000' ES, 4/11

### Water Features and Water Quality Management

There are lakes, ponds, rivers, streams, and wetlands in Windham. The most prominent water features include Saxtons River, Williams River, Cobb Brook and the 50 acre Burbee Pond. The floodplains in Windham are primarily related to seasonal high water flow in the middle and south branches of the Williams River and the Saxtons River. There are also three abandoned talc mines in Windham that have filled in with water.

Lands within Windham drain into the West, Williams, and Saxton's river watersheds. These three watersheds are identified by the State Agency of Natural Resources (ANR), for planning and management purposes, as Basin 11. Windham contains many of the headwater areas of this basin. A Basin 11 Management Plan was finalized and adopted by ANR in June 2008.<sup>1</sup> The basin plan is a public-private collaboration that develops strategies for maintaining or enhancing water quality; identifies largely voluntary strategies to remedy problems; and assigns Water Management Types to maintain or attain desired water quality. Issues such as water quality, erosion control, storm water runoff, deforestation and buffer loss, and flow regulation and flood control are addressed within the basin plan.

There is no publicly owned water supply or sewage treatment in Windham. Water supply is on-site wells and sewage treatment is on-lot septic.

### Climate and Precipitation

The climate is generally temperate with moderately cool summers and cold winters; as in the rest of Vermont. Average annual precipitation is around 52 inches, snowfall averages 90 inches. The weather is unpredictable, and large variations in temperature, precipitation, and other conditions may occur both within and between seasons. Due to the hilly/mountainous terrain in Windham, the climate can be different there than in other areas in the region. They are prone to microbursts and snow squalls.

### Emergency Response Resources

The Town of Windham is served by a voluntary fire department located in North Windham. A two-bay garage houses equipment consisting of two fire trucks and a water tanker. The Windham Volunteer Fire Company is a member of the informal mutual aid system through Southwest New Hampshire Mutual Aid. Emergency services in Windham are provided by the Londonderry Volunteer Rescue Squad, Inc. Both are volunteer non-profit organizations which are funded through donations and fundraisers. The Town is part of the Enhanced 911 state service.

Windham also supports a small Emergency Management team of volunteers whose role it is to stay informed about emergency management methods for situations other than structure and wildfires. Their role includes keeping the Town's Local Emergency Operation Plan (LEOP) up to date; seeing that appropriate training opportunities are made available to team members and town officials; communicating with Emergency Management counterparts in nearby towns and the region and informing the community members regarding emergency management resources. The designated Incident Command Center is the Town Office, and the Elementary School and Meeting House are both designated Red Cross Shelters. Windham was an early

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<sup>1</sup> The final Basin 11 Management Plan is available at: < [http://www.vtwaterquality.org/planning/htm/pl\\_west.htm](http://www.vtwaterquality.org/planning/htm/pl_west.htm) >



participant in the Red Cross Community Shelter Initiative and has a trained group of volunteers to open and manage a shelter if needed.

Windham is served by the State Police and the Windham County Sheriff’s Department which are on call for emergencies.

It should be noted that radio and cell communications are an issue in Windham because the reception is very poor. There is also nowhere to locate a radio tower because the town has looked into this, and even though there are shared frequencies, communication is still difficult. This means that if someone needs to be reached for an emergency, that person has to actually be located physically in order to be reached, which isn’t always possible. This is an added layer of difficulty in Windham that locals are used to, but which nevertheless is a problem. To help deal with the problem, Windham has an emergency contact list with cell numbers, which is widely distributed in town and is an attachment to their LEOP.

Sources

- Windham Local Hazard Mitigation Plan Update 2008
- Windham Regional Plan, October 2006
- Windham Town Plan, adopted January 5, 2015

**IV. PLANNING PROCESS**

**A. Plan Developers**

The Windham Regional Commission (WRC) and the Town of Windham coordinated on Windham’s LHMP process. Work began with Windham’s Selectboard creating a “Hazard Mitigation Planning Committee”. The Selectboard chose a wide variety of community members, both from different parts of the town and folks with various skills, knowledge, and roles within the Town (see the table below). Those that were chosen were mailed an invitation letter, which is included in appendix B. Word was also circulated informally that volunteers were welcome and the meeting was discussed at advertised at selectboard meetings on April 7th and May 19th, 2014.

Hazard Mitigation Planning Committee Members

<b>Name</b>	<b>Affiliation</b>
Heath Boyer	Emergency Co-Director
Imme Maurath	Emergency Co-Director
Paul Wyman	Windham Fire Company
Michael McLaine	Windham Fire Company
John Lingley	Chair, Windham Planning Commission
Bob Bingham	Windham Planning Commission
Pete Newton	Building Contractor, Resident of West Windham
Dona Robinson	President, Windham Community Organization
Marcia Clinton	Windham Health Officer
John Hoover	Library Trustee, Resident of North Windham

Margaret Dwyer	Water Engineer, Resident
Peter McDonald	Windham Energy Coordinator
Mary Boyer	Chair, Windham Select Board
Frank SeaWright	Windham Select Board
Kord Scott	Windham Select Board
Peter Chamberlain	Town Treasurer
Alison Trowbridge	Town Clerk
Alyssa Sabetto	Planner, Windham Regional Commission

## B. Development Process

The following section will outline the development process in putting together this plan. The development process is a pivotal piece of hazard mitigation planning because it brings people and ideas together.

The following public meetings were held regarding the Hazard Mitigation Plan:

### April 7, 2014 - Regular Meeting of the Windham Selectboard

Hazard Mitigation Plan: Initial discussion of the need for a LHMP.

Meeting notes - The Town needs a Hazard Mitigation Plan (HMP) to get the highest level of reimbursement from FEMA when applicable. The Town's most recent LHMP was adopted in 2008. Mary showed the Board the Town HMP from 2008 and a newer one from another municipality, as an example. Frank will be the Board member in charge of updating the Town's LHMP and Heath will be coordinating it with emergency services. In addition to having an up-to-date LHMP, the Town needs to adopt the State Road and Bridge Standards in their entirety, which it did later in early 2015.

### May 19, 2014 - Regular Meeting of the Windham Selectboard

Hazard Mitigation Plan: WRC's Jim Matteau presented to the Board information about developing a LHMP.

### July 14, 2014 - First meeting of the Hazard Mitigation Planning Committee

Alyssa presented to the Committee information about the LHMP including the purpose, the roles of the Town and WRC, the update and approval process, and answered questions from Committee members. She also handed out a hazard ranking sheet for all Committee members to complete. This sheet is used to define the hazards that the plan will focus on. Committee members completed the ranking sheets and gave them back to her. She also collected some photos of past flooding events for inclusion in the plan. She discussed the next steps and said that once she received the draft update from Imme she would begin working on drafting the updated plan. See Appendix A for sign-in sheets and meeting materials.

Alyssa worked on the draft between the first and second meeting; sharing the draft with Heath Boyer and Imme Maurath for review and comment during this time.

### February 12, 2015 - Second meeting of the Hazard Mitigation Planning Committee

This meeting was open and advertised to the public<sup>2</sup> The draft plan was shared with the committee prior to the meeting, so that they could review it and offer comments at the meeting. The focus of the second meeting was developing the mitigation actions. The group also discussed the hazards that the plan would address, and made alterations to the list of hazards. This is discussed further in the hazard assessment in this plan. Alyssa also met privately with Heath Boyer, Mary Boyer, and Imme Maurath before this public meeting to get other information necessary to finish the draft plan.



### C. Public Involvement and Input from Neighboring Towns

Making the Windham Local Hazard Mitigation Plan available for public comment included the following efforts:

- ❖ The draft plan was posted from January 26-March 16, 2015 on the citizens operated website: [www.windhamvt.info](http://www.windhamvt.info) for public review and comment.<sup>3</sup>
- ❖ Several news briefs regarding the plan were posted in *Windham News and Notes*, the bi-monthly newsletter produced by the Windham Community Organization. Sent to all residents free and to non-resident property owners by subscription.<sup>4</sup>
- ❖ The hazard plan was discussed at the Selectboard meetings on April 7th and May 19th, 2014.
- ❖ Hard copies of the hazard plan were made available to the public at the Town Office, Library and Fire Department.
- ❖ Fire personnel were also apprised and provided a copy of the plan.
- ❖ Public meetings were advertised and held on July 14, 2014 and February 12, 2015 at the Windham Town office.
- ❖ The plan was made available at Town Meeting on March 3, 2015. The public was informed as to how to provide input and comment.
- ❖ Flyers were posted around town advertising the draft available for comment on the citizens operated website and a hard copy available at the town office.<sup>5</sup>
- ❖ The draft plan was distributed to town officials and the Hazard Mitigation Planning Committee for comment. There was a two week public comment period. One comment was received back and incorporated.<sup>6</sup>

<sup>2</sup> See appendix F for newspaper ad and G for flyer.

<sup>3</sup> See appendix Q for website posting.

<sup>4</sup> See appendices J, K and N.

<sup>5</sup> See appendix L.

- ❖ In late March 2015, an invitation was extended via email to neighboring towns to provide a means and opportunity to review and comment on the draft Windham Hazard Mitigation Plan. Londonderry commented back on the draft and that comment was incorporated. Inter-town communication will repeat for future revisions of this Plan.<sup>7</sup>

#### **D. Changes and Status Update on Mitigation Actions Identified in the 2008 Plan**

The Windham Local Hazard Mitigation Plan was originally adopted by the Town as an Annex to the Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan and received FEMA final approval in December 2007. In 2008, WRC staff worked with the town to update their annex plan and submitted an updated draft to FEMA; in March of 2011 FEMA returned comments on the plan, revisions were made by WRC staff and the town, and the plan was resubmitted to FEMA in early August of 2011. FEMA returned comments on the plan in September of 2011. The Windham Region Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan, however, expired in December 2012. WRC received a VAPDA grant to update several town hazard mitigation plans to single jurisdictional plans, and this included Windham. The process for developing this plan began in early 2014, as discussed in the above section.

As noted in the State Hazard Mitigation Plan, regional planning commissions throughout Vermont are now mainly encouraging towns to create local mitigation plans as single jurisdictional documents rather than annexes, due to the issue of plan expiration being based on the first town that is approved in a regional effort. This plan is a single jurisdictional local hazard mitigation plan.

The following table provides an overview of Windham’s local hazard mitigation actions from the 2008 Annex along with their current status.

<b>2008 Mitigation Action</b>	<b>Fall 2014 Status</b>
Fluvial Erosion Mapping	This mapping was released by VT Agency of Natural Resources (ANR) in December 2014 <sup>8</sup> .
Annual Culvert Program Based on Inventory	WRC assisted with culvert inventory and mapping in 2012; culverts were assessed by road foreman and GPS mapped by WRC staff showing culvert condition; Windham is currently replacing 10 high priority culverts.
Replace Two Bridges	Contracts are in place
Dry Hydrant Maintenance	Ongoing by Windham Volunteer Fire Company
NIMS Compliance and Training	Windham adopted NIMS on Nov. 5, 2008; Selectboard and Road Crew went through ICS 100 training in 2008.
Road Repair and Ongoing Bank Stabilization and Erosion Control	Ongoing by Road Crew

<sup>6</sup> See appendix R for email and response.

<sup>7</sup> Email and responses shown in appendix M.

<sup>8</sup> <http://anrmaps.vermont.gov/websites/anra/>

## E. Current Hazard Mitigation Programs, Projects and Activities

This section details the emergency planning efforts that Windham engages in.<sup>9</sup> The Town of Windham supports emergency planning and disaster preparedness:

1. Windham adheres to Federal Emergency Planning and Community Right to Know Act (EPCRA) hazardous materials reporting requirements. The EPCRA requires that when certain quantities of hazardous materials are stored at a facility, they must be reported to state and local officials. According to the 2003 list of Vermont's Tier II sites, the Windham Mine, Hamm Mine, and Town Garage are listed as storing hazardous chemicals at such a quantity to require reporting to the State and local fire department.<sup>10</sup>
2. Windham participates in the National Flood Insurance Program (NFIP).<sup>11</sup>
3. Windham has a Local Emergency Operations Plan that is updated every year after Town Meeting day.
4. Windham has adopted the latest VTrans Town Road and Bridge Standards.
5. Windham's 2015 Town Plan includes information, goals and policies regarding disaster preparedness and flood resiliency.
6. Culvert inventory completed in the fall of 2012 with the Windham Regional Commission.
7. Windham is proactively working with VTrans to determine mitigation of several hazard locations on travel routes in Windham. Vtrans offers to road crews and local officials a consultant technical assistance program that gives recommendations about dealing with technical/mitigation issues.
8. Town selectboard member and floodplain administrator, Frank SeaWright, is incorporating digital data already made available through other sources ( Vtrans - roads, Culvert inventory - WRC, Parcel data - Listers, probably others) plus geo-tagged photos of ongoing culvert and road updates into a data collection accessible through open source and cross platform GIS and Database Management software.

## V. PLAN MAINTENANCE

### A. Monitoring, Evaluating, and Updating the Plan - Yearly Review

Once the plan is approved and adopted, the Emergency Management Director in Windham, along with interested and appointed volunteers, will continue to work with the Windham

<sup>9</sup> Chapter 3, section C of the Windham Town Plan deals with Local Emergency Planning <  
[https://dl.dropboxusercontent.com/u/21865226/windham-town-plan/2014\\_WindhamTown\\_Plan%20with%20changes%204.14.14\\_.pdf](https://dl.dropboxusercontent.com/u/21865226/windham-town-plan/2014_WindhamTown_Plan%20with%20changes%204.14.14_.pdf)>

<sup>10</sup> <http://www.epa.gov/agriculture/lcra.html>

<sup>11</sup> See Section VII, C, of this plan for more information on NFIP participation.

Regional Commission to monitor, evaluate, and update the plan throughout the next 5-year cycle. The plan will be reviewed annually at an April Selectboard meeting along with the review of the town's Local Emergency Operations Plan (LEOP). This meeting will allow town officials and the public to discuss and track the town's progress in implementing mitigation actions and determine if the town is interested in applying for grant funding for projects that can help mitigate future hazardous events; e.g., bridge and culvert replacements, road replacements and grading, as well as buying out any repetitive loss structures that may be in the Special Flood Hazard Area, and revise the plan as needed. Windham Regional Commission's (WRC) emergency planner will assist the Windham Emergency Management Director with this review, as requested by the Town. Progress on actions will be kept track using a table that WRC will provide to the town EMD to update. There will be no changes to the plan, unless deemed necessary by the Town. If so, the post disaster review procedure will be followed.

### **B. Plan Maintenance - 5 Year Update Process**

The Hazard Mitigation Plan is dynamic. To ensure that the plan remains current and relevant, it is important that it undergo a major update periodically as required in 44 CFR § 201.6(c)(4)(i). This update process will be thorough and occur every five years. Participants outlined below will work with the Emergency Planner at the Windham Regional Commission (WRC) in accordance with the following procedure:

1. The Windham Selectboard will appoint a team to convene a meeting of the hazard mitigation planning committee. The town's Emergency Management Director will chair the committee, and other members should include local officials such as Selectboard members, fire chief, zoning administrator, constable/police chief, road commissioner, Planning Commission members, health officer, etc. The Emergency Management Director will work with the Windham Regional Commission Emergency Planner and be the point person for the Town.
2. The WRC Emergency Planner will guide the Committee through the update process. This update process will include several advertised public meetings. At these meetings the Committee will use the existing plan and update as appropriately guided by the WRC Emergency Planner to address:
  - Update of hazard events and data gathered since the last plan update.
  - Changes in community and government processes, which are hazard-related and have occurred since the last review.
  - Changes in community growth and development trends and their affect on vulnerability.
  - Progress in implementation of plan initiatives and projects.
  - Evaluation of the plan for its effectiveness at achieving its stated purpose and goals.
  - Incorporation of new mitigation initiatives and projects.
  - Effectiveness of previously implemented initiatives and projects.

- Evaluation of unanticipated challenges or opportunities that may have occurred between the date of adoption and the date of the report, and their effect on capabilities of the town.
  - Evaluation of hazard-related public policies, initiatives and projects.
  - How mitigation strategy has been incorporated into other planning mechanisms
  - Review and discussion of the effectiveness of public and private sector coordination and cooperation.
3. From the information gathered at these meetings, and other interactions the WRC Emergency Planner has with the Town, along with data collected independently during research for the update, the WRC Emergency Planner will prepare the updated draft in conformance with the latest FEMA Region 1 *Local Hazard Mitigation Plan Review Crosswalk* document.
  4. The Selectboard will review the draft report. Consensus will be reached on changes to the draft. Emphasis in plan updates will be put on critically looking at how the plan can become more effective at achieving its stated purpose and goals.
  5. Changes will be incorporated into the Plan by the WRC Emergency Planner.
  6. The Selectboard will notify the public that the draft is available for public comment and review. The Town will advertise and make available the draft plan for public comments both electronically and in hard copy. The draft plan will simultaneously be distributed electronically to adjacent towns for review and comment.
  7. Public and adjacent town comments will be incorporated by the WRC Emergency Planner. The final draft will be provided to the Emergency Committee for final review and comment, with review comments provided to the Committee and incorporated into the plan.
  8. WRC Emergency Planner will finalize the plan with any remaining comments from the Emergency Committee and submit electronically to DEMHS and FEMA.
  9. The Plan will be reviewed by the DEMHS State Hazard Mitigation Officer (SHMO) and FEMA Region 1.
  10. SHMO and FEMA comments will be addressed in the plan by the WRC Emergency Planner.
  11. The plan will be resubmitted as needed until the plan is approved pending adoption. Once the plan is approved by FEMA, it will be ready for adoption.
  12. The Selectboard will adopt the plan and distribute to interested parties.
  13. The final adopted plan will be submitted by the WRC Emergency Planner to DEMHS and FEMA.

14. FEMA will issue final approval of the adopted plan and the five year clock will begin again.

### **C. Post-Disaster Review/Update Procedure**

Should a declared disaster occur, a special review will occur amongst the Selectboard, the Emergency Management Coordinator, the WRC Emergency Planner, and those involved in the five year update process described above. This review will occur in accordance with the following procedures:

1. Within six months of a declared emergency event, the town will initiate a post disaster review and assessment. Members of the State Hazard Mitigation Committee will be notified that the assessment process has commenced.
2. This post disaster review and assessment will document the facts of the event and assess whether existing Hazard Mitigation projects effectively lowered community vulnerability/damages. New mitigation projects will be discussed, as needed.
3. A draft After Action Report of the review and assessment will be distributed to the hazard mitigation committee.
4. A meeting of the committee will be convened by the Selectboard to make a determination of whether the plan needs to be amended. If the committee determines that NO modification of the plan is needed, then the report is distributed to local communities.
5. If the committee determines that modification of the plan IS needed, then the committee drafts an amended plan based on the recommendations and forwards to the Selectboard for public input.
6. The Selectboard adopts the amended plan after receiving approval-pending-adoption notification from FEMA.

### **D. Continued Public Participation**

Maintenance of this plan and implementation of the mitigation strategy will require the continued participation of local citizens, agencies, and other organizations. To keep the public aware of and involved in local hazard mitigation efforts, the town will take the following measures:

- Provide hazard mitigation information at Town Meeting
- Schedule and advertise a planning meeting each year, soon after Town Meeting
- Seeking participation from key players in addition to general public interest:
  - Select board
  - Planning Commission
  - Public Works



- School
- Fire & Rescue
- Emergency Mgt/ 911 Coordinator
- Town Administrator
- Post the hazard mitigation plan on the citizens operated website
- Selectboard will review past hazard mitigation committee members and consider whether new members should be added. Representatives of local businesses, nonprofits, academia, etc. should especially be considered.
- Notify the public of committee meetings through town bulletin board, citizens operated website, *News and Notes* newsletter, newspaper, Facebook, Front Porch Forum, etc.

## VI. Vulnerability Assessment, Hazard Ranking and Hazard Profiles

The risk assessment portion of a Hazard Mitigation Plan contributes to the decision-making process for allocating available resources to mitigation projects. 44 CFR Part 201.6(c)(2) of FEMA’s mitigation planning regulations requires local municipalities to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

### A. Assessment Methodology and Hazard Ranking

At the initial meeting, on July 14, 2014, of the WRC emergency planner and the Windham hazard mitigation planning committee, the committee members each completed a worksheet whereby they ranked hazards based on frequency of occurrence, warning time and potential impact. This was a vulnerability assessment. A vulnerability assessment measures: What hazards can affect your community? How bad can it get? How likely are they to occur? What will be affected by these hazards? How will these hazards affect you?

The **Potential Impact** (percentage of the community affected) of the hazard can be classed as follows:

1 = Negligible	Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries
2 = Minor	Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries
3 = Moderate	Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities
4 = Major	Severe property damage on a town-wide or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

**Frequency of Occurrence: Probability**

1 = Unlikely	<1% probability of occurrence in the next 100 years (less than 1 occurrence in 100 years)
2 = Occasionally	1-10% probability of occurrence per year
3 = Likely	>10% but <100% probability per year (at least 1 chance in next 10 years)
4 = Highly Likely	100% probable in a year (an annual occurrence)

**Warning Time:** Amount of time generally given to alert people to hazard

1 = More than 12 hours
2 = 6-12 hours
3 = 3-6 hours

4 = None–Minimal

Additionally, seasonal patterns that may exist are considered, what areas are likely to be affected most, the probable duration of the hazard, the speed of onset (amount of warning time, considered with existing warning systems).

**The combination of the Potential Impact, Frequency of Occurrence and Warning Time were used to determine the hazard ranking score for each hazard.** The table below shows each of the hazards that were addressed and the score that they received based on fifteen completed worksheets. The worksheet/hazard ranking table is shown in Appendix E. The blue highlighted items in the below table are items that the committee added to the hazards list.

Hazard	Hazard Score
Severe Weather (Thunderstorm, Lightning, High Wind, Hail, and Flooding) *Note: We have defined 'Severe Weather' to include two or more of the above hazards.	117
Structure Fire	115
Flood/Flash Flood/Fluvial Erosion	109
Extreme Cold/Snow/Ice Storm	109
Wildfire	107
Landslides/Mudslides/Rockslides	104
Downed Power Lines / Power Failure	97
Hurricanes/Tropical Storms	96
Hail Storms	83
Hazardous Material Spill	83
Dam Failure	81
Ice Jams	81
Tornado	80
Beaver Dams	70
Extreme Heat	67
Water Supply Contamination	64
Invasive Species/Infestation	65
Earthquake	58
Drought	53
Vermont Yankee disaster	33

Pandemic	9
Tsunami (Vermont is landlocked.)	0
Volcano (Vermont has no active volcanoes.)	0

The community has identified and chosen to focus on the following three “top hazards” to which the Town of Windham is most vulnerable:

1. Flood/Flash flood/Fluvial Erosion
2. Extreme cold/Winter Storm
3. Wildfire/Structure Fire

This plan will also briefly address the community identified hazards of downed power lines/power failures and beaver dams. There was a discussion at the public meeting on February 12, 2015 about landslides and fluvial erosion. It was decided that the issue that the town faces is small landslide issues caused by fluvial erosion. There are not large scale landslides in Windham. Therefore, landslides will be discussed in the discussion about fluvial erosion.

While all hazards were considered by the Committee for inclusion in this plan, it is not feasible to study each in depth. The hazards not profiled in this plan are considered to be unlikely (<1% probability of occurrence per year) in the Town of Windham and therefore will not be profiled in this plan. The rationale for not addressing all of the hazards is that they are unlikely to occur in Windham. The hazards not addressed in this plan are: hail storms, hazardous material spill, dam failure, tornado, extreme heat, water supply contamination (no public water supply), invasive species infestation, earthquake, drought, Vermont Yankee disaster (Windham is outside 10 mile radius EPZ), pandemic, tsunami and volcano. Ice jams and severe weather associated with hurricanes are both covered in the flooding section. For hazards that are not profiled in this plan, the reader is directed to the latest *State of Vermont Hazard Mitigation Plan*.<sup>12</sup>

Within each hazard profile, previous occurrences of each hazard will be listed, including the County-wide FEMA Disaster Declarations (DR-#), where applicable. Information about hazard events was gathered from local sources (ex. town records and knowledge), annual town reports, the National Climatic Data Center’s (NCDC’s) Storm Events Database, the Spatial Hazard Events and Losses Database for the United States (SHELDUS) 1960-2012, and Special Reports produced by the National Weather Service in Burlington, Vermont. Other source information is noted throughout where appropriate and in footnotes.

## B. Flood/Flash Flood/Fluvial Erosion

### Description

Flooding is the most widespread and destructive hazard in the United States. Flooding has also been the most common and costly hazard to affect Windham. Flooding can occur anytime of the

<sup>12</sup> The latest State of Vermont Hazard Mitigation Plan was completed in November 2013. Information from that plan was used in developing this hazard mitigation plan.

year as a result of heavy rains, thunderstorms, tropical storms, hurricanes or Nor'easters. It can result from the overflow of major rivers and their smaller tributaries, or inadequate local drainage. Historically, floods have been a factor in over 80 percent of all federally declared disasters. People living in close proximity to bodies of water such as rivers, lakes, and streams are at greater risk from flooding than those not living in the floodplain. There is a 26 percent chance of experiencing a flood during the life of a 30-year mortgage compared to a 4 percent chance of a fire. Windham has an NFIP compliant floodplain ordinance, which gives residents access to discount flood insurance and enables the Town to regulate development within the SFHA. SFHAs are subject to inundation by the 1% annual chance flood (100-year flood). Maps of these areas can be found in the vault at the Town Office or online at the FEMA Map Service Center.<sup>13</sup>

### **Impact and Description of Locations Impacted**

Most of the destruction from flooding in Windham is due to fluvial erosion rather than inundation, which is the type of flooding targeted through the NFIP. Fluvial erosion is the destruction of river banks caused by the movement of rivers and streams. This can range from gradual bank erosion to catastrophic changes in river channel location and dimension during flood events. This occurs when the stream has more energy than is needed to transport its sediment load, due to channel alterations or runoff events that increase water speed in the channel. The issue of erosion based flood mitigation is currently being addressed through a stream geomorphic assessment study of the Saxton's River Watershed. Fluvial erosion hazard mapping was released by the VT Agency of Natural Resources in early December 2014. This mapping will assist municipalities in developing bylaws and effective mitigation strategies to regulate development within fluvial erosion hazard zones. Windham does not currently have a fluvial erosion bylaw, but is currently developing one.

Ice jam flooding is fairly common in the early springtime, generally around March. The heavy rainfall, combined with runoff from snowmelt due to the mild temperatures, results in flooding of rivers, streams and creeks, mainly from the formation of ice jams. Windham doesn't have mapped ice jams.<sup>14</sup> There are some small ice jams on upstream areas in the hills, but these do not affect any development.

At higher elevations, such as Windham, flash floods typically occur in drainage areas as a result of summer thunderstorm activity. Infrastructure and structures along higher elevation streams and drainage areas are most susceptible to damage from flash flooding. Flash floods are likely in Windham, and potential damage to Route 30 or Route 121 could limit access to Town, as they are major travel corridors through Town and through the region. Drainage ditches and culverts are the biggest concern for local flash flooding events. Some of the most vulnerable areas are where major streams cross Windham Hill Road, Route 121, and West Windham Road. The middle and south branches of the Williams River, Saxtons River, and Burbee Pond have areas in the 100-year mapped floodplain. Burbee pond is dammed and the stone dam was part of an old mill. It is owned and maintained privately. If this dam broke, it would flood Turkey Mountain Brook, which would create issues for Jamaica but not for residents in Windham.

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<sup>13</sup> <https://msc.fema.gov/portal>

<sup>14</sup> CRREL Ice jam database/map <<http://rsgisias.crrel.usace.army.mil/apex/f?p=273:9:0::NO>>

There are open mine pits at the U.S. Talc/North Windham Talc Mine which have been subject to flooding of a residence off of White Road. As a result of litigation among the current mine owner, the original Act 250 permit holder, the Town of Windham and one or more of its landowners, this hazard has been mitigated as of 2012. A state of the art system for flood control and fluvial diversion has been installed and is monitored and maintained both physically and electronically to standards set by the State of Vermont Dam Safety Department.<sup>15</sup>

### **Fluvial Erosion**

Most of the impact of flooding in Windham is caused by fluvial erosion. There was a discussion at the public meeting on February 12, 2015 about landslides and fluvial erosion. It was noted that the landslides are caused by fluvial erosion and for the most part are small issues that are a hazard affecting mostly affecting the health of the waterways. The hazard is seen more by actually walking the waterways than by driving through town.

There was a property on Route 121, between Four Corners and Route 11, there was a major landslide into a creek. VT Department of Agriculture mitigated this project by stone-lining both sides of the creek for stabilization. There is another small piece of property in this same area that was recently donated to the town because it was deemed undevelopable due to fluvial erosion/landslide issues. There is a landslide issue at the bottom of Horsenail Road that is also on private property. Another area of fluvial erosion at the top of White Road where are couple property owners have large lawns that lead to a lot of runoff creating erosion issues with the Saxtons River, and wash away of White Road on both sides of the road. The other area of note is on Wheeler road near Abbot Road where there is a ledge and a creek on the other side, a combo of which cause fluvial erosion issues. The landslides in Windham are mainly only affecting individual property owners, and not town infrastructure.

### **Floodplain and Fluvial Erosion Hazard Mapping/ Mapping of Locations Impacted**

The following maps were taken from the VT Agency of Natural Resources 'Natural Resource Atlas.' This data was used because it shows the recently developed Fluvial Erosion Hazard (FEH) areas as well as the FEMA defined Special Flood Hazard Areas (SFHA) which are based on the base flood or 100-year flood.

Fluvial erosion hazard mapping was released by the VT Agency of Natural Resources (ANR) in early December 2014. This mapping will assist municipalities in developing bylaws and effective mitigation strategies to regulate development within fluvial erosion hazard zones. Windham has been proactive in developing a fluvial erosion bylaw, which is included with their floodplain regulations. This bylaw is considered interim for the river corridor criteria set by Vermont Division of Emergency Management and Homeland Security (DEMHS). Windham should work with the Windham Regional Commission and ANR to ensure that their floodplain bylaw remains inclusive of river corridors.

FEMA Flood Insurance Rate Maps (FIRMs) are available through the FEMA Map Service Center.<sup>16</sup> These maps are also available at the Town Office. The map effective date for the latest FIRMs for Windham County is 9/28/2007. There are no FEMA designated floodways in

<sup>15</sup> WindhamTown Plan, Chapter III, Section C2

<sup>16</sup> <https://msc.fema.gov/portal/search?AddressQuery=wndham%2C%20vermont>.

Windham. All of the mapped SFHAs are A zones, the lowest level flood hazard area mapped by FEMA.

Properties within these areas, that have a mortgage, are required to purchase flood insurance. Windham's participation in the NFIP gives residents and businesses access to discount flood insurance through the program.



The northern half of Windham is shown in the above map. The orange shaded areas are the 'A level' SFHA's. The white shaded areas are FEH zones. These both lie along the middle branch of the Williams River on the west border of the town, the south branch of the Williams River which runs along Popple Dungeon Road (this road sees a lot of damage and damage photos

from flooding on August 3, 2003 are shown in appendices O and P). The SFHA and FEH along Route 121 on the map is from the Saxtons River. As noted previously, Windham is the headwaters for these waterways. Much of the fluvial erosion issues noted in the impact discussion above are in these mapped hazard areas.



This SFHA at Burbee Pond Road is the orange area in the center region of the above map of the southern half of Windham. As shown, the white shaded areas along the waterways of Cobb Brook to the west, Turkey Mountain Brook in the center, and the small portion of SFHA (near the Green Mountains label on the map). This area is South Windham, and though it is SFHA, flooding hasn't been an issue there according to town residents.

**Extent**

There are three stream gauges that measure watersheds in Windham<sup>17</sup>:

<sup>17</sup> Stream gauge data courtesy of <http://waterwatch.usgs.gov>

- USGS 01154000 SAXTONS RIVER AT SAXTONS RIVER, VT - The Saxtons River drains a northeastern section of Windham. The highest recorded measurement on the Saxtons River was 19.58 feet, which was measured during TS Irene on August 28, 2011. Before this the highest was 17.9 feet measured in September of 1938. Average height for this reach is about 5.62 feet.
- USGS 01155910 WEST RIVER BELOW TOWNSHEND DAM NEAR TOWNSHEND, VT - This is the gauge closest to Windham, to the south. The highest recorded measurement on the West River at Townshend was 8.89 feet, which was measured during on April 24, 1996. This isn't even above flood stage of 11 feet, which is because the Townshend dam is a flood control dam.
- USGS 01153550 WILLIAMS RIVER NEAR ROCKINGHAM VT - The northern portion of Windham drains to the Williams River. The highest recorded measurement on the the Williams River near Rockingham was 17.94 feet, which was measured during during TS Irene on August 28, 2011. Before this the highest was 10.69 feet measured on March 31, 1987. Average height for this reach is between 5 and 6 feet.

There are also observations from Windham weather watcher of extremes that are notable:<sup>18</sup>

- Summer of 2009 we had 22 inches of rain in three months.
- Four inches of rain in 18 hours in October 2010. 13 inches of rain fell total that month.
- In 2011 we had 42.8 inches of rain May through September, with 18.2 inches in August (10 from TS Irene in less than 8 hours) and 11.25 inches in September.

### Probability

Flooding and fluvial erosion events are highly likely, as determined by the Road Foreman and other members of the Hazard Mitigation Planning Committee. There are frequent road washouts every year, especially during spring snow melt and late summer season rains.

### Past Occurrences

Since 1996, when National Climatic Data Center<sup>19</sup> detailed records start, there have been 35 flood events in Windham County, Vermont. There have been several Presidentially Declared Disasters in recent years for Windham County which have included severe thunderstorms and associated flooding. Windham County, including the Town of Guilford, experienced nearly constant rain and thunderstorms in the late summer of 2003. The storms affected Guilford from the period of July 21 through August 18. FEMA Declaration DR - 1488 was associated with this event. Many roads were washed out and culverts needed replacing throughout town. The following year, another severe period of flooding and thunderstorms, which lasted from the period of August 12- September 12 engendered Presidential Disaster Declaration DR - 1559. In 2007, Windham County was part of DR - 1698, and DR-4043 in May 2011, and DR-4022 in September 2011.

The Town of Windham experienced extensive public and private property damage as the result of significant flooding over the period of July 21 through August 18, 2003, resulting in approximately \$700,000 in damages. The storm all but destroyed Route 121 and was so

<sup>18</sup> Observations made by local resident and Windham weather watcher Lydia Pope Francis.

<sup>19</sup> National Climatic Data Center <http://www.ncdc.noaa.gov/>. Data generated November 2014 via database download.



significant that the Town had to obtain financial aid from a local bank in order to subsidize the repairs. This disaster was declared a federal emergency and federal funding was provided for road assessment and repairs. (\$834,874 was provided Windham.)<sup>20</sup> Total flood repair costs for Windham in 2003 were \$942,621 and \$1,184,144 in 2004. Pictures, taken by Paul Wyman, of damages from this August 2003 storm can be found in Appendix O.

In 2007 Windham County was part of a Presidentially Declared Disaster associated with severe storms and flooding during the period of April 15-21 2007. For the Town of Windham, costs associated with this disaster and local flooding in previous years has been shared through funding from the state.

Extensive damage was done to Windham's roads and culverts in August 2011 during Tropical Storm Irene. The southern end of Harrington Road was destroyed and almost all town roads sustained some damage. Damage photos are in Appendix P. Although Windham received all but 5% of the \$718,667 spent on recovery, they are continuing to seek grants to enable upgrade of culverts and bridges in order to meet new state requirements.

#### History of Occurrences:

Date	Event	Location	Extent
Oct 2014	Major rainfall	Wheeler Road	\$64,000 of damage on Wheeler and Horesnail Road; this was washout and culvert damage; fluvial erosion (town knowledge-not shown in NCDC storm events database)
7/28/2014	Major rainfall, flooding, micro-burst	Town wide	Major road damage on Horsenail Road; total damages estimated at \$211,000
9/12/2013	Flash Flood, Thunderstorm, High Winds	Region/County-wide	
9/1/13	Flash flood/heavy rain	Region/County-wide	
3/19-3/23/2012	Heat wave in March	Region/Town wide	Week of 80 degree weather on wet slushy roads caused \$250,000+ in roadway damage
8/28/2011	Tropical Storm Irene; flooding, fluvial erosion, damaging winds	Region wide	Extreme rainfall averaging 4-8 inches within 12 hours resulted in catastrophic flooding Countywide. Tropical Storm Irene caused \$872,359 worth of damages to the Town of Windham.
5/20/2011	Severe storms and flooding	Region wide	
4/15/07-4/21/07	Flooding and severe storm	Region/County-wide	

<sup>20</sup> 2015 Windham Town Plan, Chapter III, Section C2

8/3/2003	Flash flood	County-wide	A slow moving storm over Windham County produced 3 to 4 inches of rainfall in about four hours time. County Highway 121 was washed out in the Town of Windham. Total damages in Windham cost \$942,621.
7/16/2000	Flash flood	Region/County-wide	
9/16/1999	Flash flood/high winds	Region/County-wide	Remnants of Hurricane Floyd; The storm brought both high winds and 3-6 inches of heavy rainfall to Southern Vermont. \$300,000 in damages
6/19/1998	Flash floods	County-wide	Torrential downpours produced flash flooding throughout the County; Several mountain roads were washed out.
6/12/1996	Flash flood	County-wide	A very moist and unstable atmosphere was situated over Vermont. This resulted in torrential rains from training thunderstorms which dumped approximately 6 inches (radar estimate) of rain near Grafton in Windham County. Flash flooding occurred at Grafton during the late afternoon and early evening.
1/19-1/27/96	Flooding	Western Windham County	Road washouts throughout the area because of rainfall on already saturated soils. \$300,000 reported damages in County
1976	Flood	New England region	Millions of dollars of damage
1973	Flood	Region wide	Major flood event caused over \$3.5 million in damages throughout Windham County
1936	Flood	New England region	24 lives lost and \$113 million in damage in the region
11/3/1927	Flood	Statewide	10 inches of rain on frozen ground; Deadliest natural disaster in the history of the State; 84 lives lost, 9,000 left homeless, and over \$28 million in damage Statewide

### C. Extreme Cold / Winter Storm

#### Description

The Region has a long history of severe winter storms and blizzards and usually experiences at least one or two Nor'easters each year with varying degrees of severity. There have been 114 winter storms in the Region since March 1960, including 48 extreme snowfall events since 1996, 6 major ice storms, and 155 winter storm or winter weather events – all since 1996. A typical event begins as a low-pressure system that moves up the Atlantic Coast, into the Canadian Maritimes, dumping heavy snow across parts of Vermont. Snowfall accumulations are generally three to six inches in the valleys and 6 to 12 inches in the mountains. Winter storms and ice storms can cause power lines to fail, damage trees and impede access to homes and businesses. Windham has not received any financial assistance from the State or FEMA for recovery from severe winter weather.

**Extent:** The severity or magnitude of winter storm to occur in southeast Vermont can range from moderate to very severe. The southeastern region of VT typically receives over 60 inches of snowfall per year, and most Vermonters are prepared to handle large amounts of snowfall.

At an elevation of 1,500-2,400 feet, Windham is the highest incorporated town in Vermont. Rugged terrain and low population density can lead to isolation. The topography leads to unpredictable patterns of snow accumulation.

Seasonal Snowfall records per the Burlington, VT Weather Service:

#### Seasonal (Jul 1<sup>st</sup> – Jun 30<sup>th</sup>)

#### Maximum                      Minimum

Rank	Snowfall	Year(s)	Rank	Snowfall	Year(s)
1	145.4"	1970-71	1	31.8"	1912-13
2	132.0"	1886-87	2	32.0"	1904-05
3	128.4"	2010-11	3	37.7"	2011-12
4	122.4"	2000-01	4	38.3"	1928-29
5	120.2"	2007-08	5	38.7"	1926-27
6	116.9"	1992-93	6	39.6"	1979-80
7	113.5"	1887-88	7	40.4"	1988-89
8	111.6"	1965-66	8	40.7"	1948-49
9	108.9"	1971-72	9	42.5"	1990-91
10	107.2"	1993-94	10	43.0"	1903-04

Windham has a resident that keeps weather records as a hobby. She shared some of that data for this plan. The highest snowfall season for Windham on record is the season of 2002-2003. The table below shows the amounts from 2002-2003 through 2014-2015. It is interesting to note that the number one ranked snowfall from the Burlington Weather Service data in the above

data table is 145.4 inches in 1970-71, which is less than Windham's highest season on record with 177 inches.<sup>21</sup>

Season	Amount of snow (in inches)
2002-2003	177
2003-2004	153
2004-2005	118
2005-2006	84
2006-2007	105
2007-2008	119
2008-2009	138
2009-2010	100
2010-2011	81
2011-2012	70
2012-2013	115
2013-2014	no record
2014-2015	100

There are also observations from Windham weather watcher of extremes that are notable:

- Heaviest snows are often in March, exacerbated by warmer temperatures meaning heavier/wet snow.
- In mid-March 2002 we had 7 feet of snow in one week.
- Mid-April 2007 we had a foot of snow and 2 1/2 inches of rain in one week.
- February 2010 we had 42 inches of snow between 23<sup>rd</sup> and 27<sup>th</sup>.

**Probability:** Extreme cold and winter storm events are highly likely, as determined by the Road Foreman and other members of the Hazard Mitigation Planning Committee. Every winter there is a weather related incident where people in town will lose power for a few days.

**Impact:** Damage from heavy snow and ice storms can vary depending upon wind speeds, snow or ice accumulation, storm duration, and structural conditions (such as heavy snow and ice accumulation on large, flat roofed structures). The assessed value of all residential and commercial property is \$100,127,500. Assuming a range of town-wide damage of 1% to 5%, a heavy snow or ice storm could result in \$1,001,275 to \$5,006,375 of total damage. Problems sometimes arise with finding locations to deposit huge quantities of snow during the season because there isn't always a mid-season melt off. Snow amounts are not necessarily a problem for Vermonters, but heavy, wet snow, or the event of rain on snow or frozen ground, are usually very problematic.

Windham is experiencing more ice storms than they did in previous years. Town Garage is flat roofed, and parts of the school building, are flat roofed, so they are of particular concern. The town garage is a particular concern. Two main roads into Windham (Route 121 and Windham Hill Road from Route 30) are both very sloped, so they pose a risk for cutting the town off.

<sup>21</sup> Windham snowfall records are kept by local resident and Windham weather watcher Lydia Pope Francis.

**Notable past weather events include:**

There have been three winter storms in recent history in Windham County that were Disaster Declarations:

- Ice Storm (DR-1201) – January 6-16, 1998
- Snowstorm (EM-1358) – December 16-18, 2001
- Winter Storm (DR-1816) – December 11-18, 2008

Other major events:

November 25 and 26, 2014 – Major snow event that was followed by a major rain event resulting in a thick layer of ice that covered everything, weighing down power lines, resulting in widespread power outages. The longest power outage was seven days for some residents in Windham.

Feb. 25, 2011 - A storm system produced a widespread swath of heavy wet snow across southern Vermont during the day Friday. Snowfall rates of 1 to 2 inches per hour occurred, beginning during the early morning hours, and persisting until late afternoon. Snowfall amounts of 12 to 17 inches occurred across much of southern Vermont. The heavy wet snow created treacherous travel conditions for both the morning and evening commutes on Friday, and also led to numerous school and business closings.

Jan. 19, 2011 - Snow and sleet accumulations across southern Vermont varied from 3 to 9 inches, with ice accumulations of up to a half of an inch.

Jan. 12, 2011 - Heavy snow fell across southern Vermont with snowfall accumulations ranging from 14 inches up to 3 feet. A mesoscale snowband set up across the western New England, including southern Vermont, Wednesday morning resulting in snowfall rates of 3 to 6 inches an hour.

March 20, 2002 - An area of low pressure developed in the Ohio Valley early on March 20th. The air was just cold enough for the precipitation to fall mostly in the form of snow across southern Vermont. This snowstorm, on the first day of astronomical spring, was elevation dependent, as a swath of 6 to 12 inches accumulated across the higher terrain of Bennington and especially Windham Counties, especially in the area of Windham. Some specific snowfall amounts included 9.0 inches at Peru, Bennington County, 9 at Townsend Lake and a foot at West Wardsboro. With the exception of some vehicular accidents, no other significant problems were reported to the National Weather Service office at Albany, NY as a result of this early spring storm.

November 22, 1997 - A low pressure system south of Long Island on November 22, 1997 produced heavy wet snow across southern Vermont. Snowfall averaged 4 to 8 inches in Bennington and Windham Counties. The heavy wet snow downed trees and power lines, which produced scattered power outages. The power outages were most widespread in Windham County.

1998 - There was a threatening ice storm in the higher elevations (1,500-1,900 feet) of the region.

Nov. 26, 1996 - On November 26, a low pressure system brought a combination of snow and freezing rain to southern Vermont. Over Bennington and Windham Counties, snow and heavy freezing rain downed trees and power lines and caused numerous accidents. Across southern Vermont approximately 10,000 customers lost power.

Jan. 2, 1996 - A major winter storm developed over the Gulf coast states on January 2nd and tracked northeast along the eastern seaboard during January 3rd. Heavy snow fell across southern Vermont with the average snowfall ranging from 10 to 12 inches.

#### **D. Wildfire / Structure Fire**

**Description:** Wildfires pose a unique danger to communities and individuals. Wildfires are more likely to occur during dry seasons or dry spells, especially in the spring and summer. As residential areas expand into reforested areas, forest fires increasingly threaten people and residences. Protecting structures in these reforested areas from fire poses special problems, and can stretch firefighting resources to the limit. If heavy rains follow a major forest fire, other natural disasters can occur, including landslides, mudflows, and floods. Once ground cover has been burned away, little is left to hold soil in place on steep slopes and hillsides. A major wildfire can leave a large amount of scorched and barren land, and affected areas might not to return to pre-fire conditions for decades. If the wildfire destroys the ground cover, then erosion becomes one of several potential problems.

There are three different classes of wildland fires. A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or sometimes below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

Wildfires can spread to residential areas, thus forcing whole communities to evacuate. When fires are followed by heavy rains, the potential for mudslides and flooding is increased. Most of Windham is heavily forested. Hence, there is potential, given the right conditions, for widespread forest fires. However, wildfire conditions do not occur frequently in Vermont due to the relatively high annual precipitation levels. During periods of drought, lightning is a risk for starting fires. But by far, the most common cause of wildfires in Vermont is humans through either burning refuse or untended or improperly putting out camp fires, among other reasons. Northern New England experienced some large forest fires in the late 1940s. Portions of the Vermont forest are now beyond the natural burn cycle which increases the risk of fire. Communities and residents in forested areas should keep this in mind and be careful when doing activities that could lead to fire spreading.

Structure fires are highly likely but not common in Windham. Structure fires can result in loss of property and/or life. They can affect a single residential structure or spread to other homes, businesses or apartment complexes. Residential fires kill more people in the U.S. each year than all natural disasters combined. In Vermont, 12 fatal fires resulting in 22 civilian deaths occurred in 2000. The most significant common factor in fire fatalities in Vermont continues to be the

absence of a functioning smoke detector in the sleeping area of residential structures. Fires can be caused by improperly disposing of ashes with live coals from wood stoves or faulty electrical wiring. There are a large number of seasonal homes in Windham, which are commonly located in woodland areas and are particularly at risk because they are not occupied year-round.

**Extent / Impact:** The primary cause of wildfires in Windham has been people burning rubbish/brush and it becomes a grass fire. The largest wildfire in Windham was approximately 5-10 acres off of Scott Pet Road in 2009 in a heavily forested cliffside area facing west. The impact of damage from wildfires is difficult to project because it depends on when they are discovered and the size of the burn. With approximately 93% of Windham being forested land, the potential for large scale impact is there. Woodland value in Windham is \$10,873,400. Assuming a loss rate of 10-50%, forest fire damages could be in the range of \$1,087,340-5,436,700 for woodland alone.<sup>22</sup>

Structure fire danger is generally universal and can occur practically at any time. Damage would depend upon the extent of the fire, the number and type of buildings damaged and the contents destroyed within the structures. Structure fires are highly likely, but are typically not an annual event in Windham. With an average home value of \$203,660 in 2014, and assuming one structural fire resulting in the total loss of a structure happens on average once every two years, structural fires could result in \$101,830 in damage in an average year.

Below is a list of the most critical structures in Windham:

- Town Office, 5976 Windham Hill Rd
- Windham Elementary School, 5940 Windham Hill Rd
- Windham Congregational Church (also known as The Meeting House/Town Hall/Library), located at 26 Harrington Rd – This is a historic structure and an excellent example of a timber frame building.
- Town Highway Garage, Windham Hill Rd
- Windham Volunteer Fire Company, White Rd, N. Windham

There are open spaces around most of the above structures so they are not particularly vulnerable. As for forest fires, there are no areas of Windham that stand out particularly for vulnerability of forest fires, but the fact that some areas of Windham are so remote means that getting to a fire could be very difficult.

**Probability:** Based on the history of occurrences of wildfires in Windham, they are likely but not guaranteed to occur in any given year. The conditions vary year to year based on how dry things get. Wildfires are more likely to occur in Spring and Fall in Vermont.

#### History of Occurrences:

2008 to 2014 – fire calls per year - Windham Volunteer Fire Company		
Year	# of Structure Fires	# of Wild Fires
2008	7	0
2009	1	2

<sup>22</sup> Data provided by Jerry Dyke on 10/14/14

2010	6	1
2011	5	0
2012	2	2
2013	2	1
2014	6	3
<b>Total</b>	<b>29</b>	<b>9</b>

The table above shows that structure fires are more of an issue in Windham than wildfires. The best way to mitigate for fires is fire prevention through education and providing good protective and preventive devices, such as smoke alarms and fire extinguishers.

The fire data provided in the table above was provided by Mike McLaine, of the Windham Volunteer Fire Company.<sup>23</sup> They do not have electronic records prior to 2008. The data in the table includes mutual aid calls, so does not represent fires occurring only in the town of Windham.

### E. Other Hazards that the Community wants to address

#### Downed power lines/power failures

Power failure is a common event in Windham and can occur anywhere in town. Power failures are typically the result of power lines damaged by high winds or heavy snow/ice storms. Power failures may also result from disruptions in the New England or National Power Grid, as indicated by the widespread power outages in 2003. It is unknown to Windham what the cause of the outages was. Dead or dying trees in close proximity to power lines, ice, exploding transformers, and auto accidents all pose a threat for power failure. During TS Irene a group of 3 large trees fell across a power line on Route 121. Due to access problems it was 3 days before they were cleared. Because so much of town is forest lands and power lines go through the back country, many repairs are not reported to the town. More recently in 2014, a power line fell on Windham Hill Road, a car drove over it and blew out all four tires.

Potential loss estimates are difficult to predict for power failures, which typically are isolated in geographic area and short in duration. Therefore, they often have only minimal impact to people and property. Power failures usually result in minor inconveniences to residents; however, longer duration events might result in the loss of perishable items and business losses. Power outages in winter months could result in the loss of home heating, bursting water pipes and resulting structural water damage. Residents in Windham note that "...our power outages are usually of long duration. Given our small population we are generally last on list when there are major area wide outages - VELCO works on areas where they can restore the most people first."

The town does have records of the number of power outages each year since 2006<sup>24</sup>:

Year	# of Outages
2006	6
2007	2

<sup>23</sup> Data provided on January 31, 2015 via email.

<sup>24</sup> This information is courtesy of the record keeping of Windham resident Lydia Pope Francis.



2008	7
2009	6
2010	7
2011	10
2012	6
2013	4

### **Beaver Dams**

Beavers play an important role in the ecosystem by creating habitat for assorted furbearer, bird, plant and waterfowl species. For example, the federally endangered northeastern bulrush occurs in southern Vermont only in beaver flowages. Beaver activities also may stabilize stream banks, control sedimentation of streams and provide groundwater recharge areas. In this way, the beaver provides ecological benefits to the public at large. This recognition of their value is growing. On the other hand, the beaver's dam building activity can result in widespread flooding of woodlands and agricultural land, and cause numerous complaints by plugging road culverts, flooding roads and railroad tracks, and causing general property damage.<sup>25</sup>

In the 1970's a dam in a pond above Abbott Road in the Stiles Brook Tract failed and washed out the road. The pond reappeared sometime prior to 2013-14 and covered a much larger area than previously. Residents of Abbott road reported the pond, and the Emergency team reported it to ANR. ANR investigated, with the landowner, and the pond is now drained. That issue was handled between the landowner and ANR. The pond will come back (it always does) but the Town is aware of it and keeps an eye on it. Other incidents are infrequent. Lots of beavers live in the area, but they aren't causing problems. Several of the larger beaver dams are noted in the maps on pages 19 and 20 of this plan. Notable dams in Windham are at Burbee Pond and two dams in the headwaters of Turkey Mountain Brook, the top one is very large. The Town had VT ANR inspect the dam and it was recommended that the dam be left alone. Windham is changing their view of handling them because they do have a recognized value in the ecosystem. Beavers, ponds and flow control devices are discussed in Ch. IV of the 2015 Town Plan.

## **F. Vulnerability Assessment**

### **1. NFIP Structures that have suffered repetitive damage**

According to FloodReady.Vermont.gov, Windham has no repetitive loss properties.<sup>26</sup> A Repetitive loss structure is an NFIP-insured structure that has had at least 2 paid flood losses of more than \$1,000 each in any 10-year period since 1978.<sup>27</sup> Severe repetitive loss (SRL) structures are NFIP-insured buildings that, on the basis of paid flood losses since 1978, meet either of the loss criteria described in the SRL section. SRL properties with policy effective dates of January 1, 2007 and later will be afforded coverage (new business or renewal) only through the NFIP Servicing Agent's Special Direct Facility (SDF) so that they can be considered for possible

<sup>25</sup> VT Fish and Wildlife – “Best Management Practices for Resolving Human Beaver Conflicts in Vermont” report, August 2002.

<sup>26</sup> Report listing repetitive losses is available here:

<<http://floodready.vermont.gov/sites/floodready/files/documents/RLReport6.17.14.pdf>>

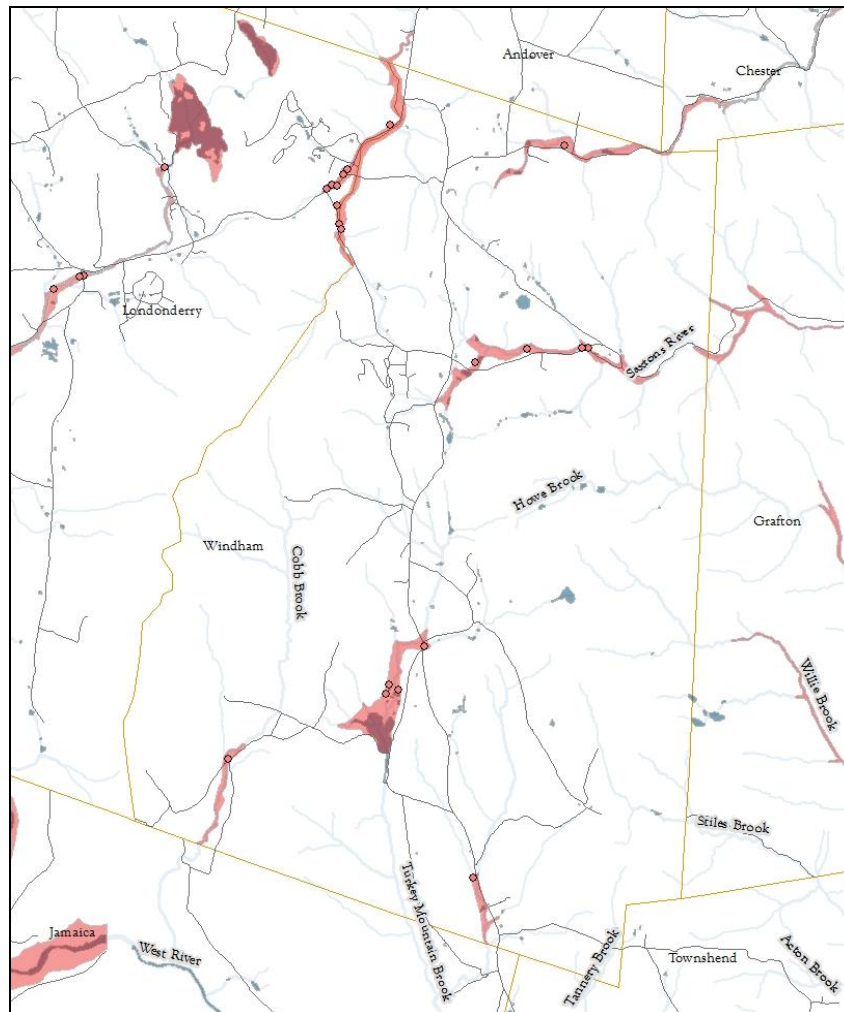
<sup>27</sup> <https://www.fema.gov/national-flood-insurance-program/definitions>

mitigation activities. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
- For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

## 2. Vulnerable Structures

There are 12 structures that E911 notes as being within a Special Flood Hazard Area (SFHA), and of these 12 structures, 17% have flood insurance. These structures represent 3% of the structures in Windham.<sup>28</sup> The structures are shown by the red dots on the below map.



<sup>28</sup> Information available on Windham's Expanded Community Report which is accessed via < <http://floodready.vermont.gov>>. Map Provided by VT State Flood Hazard Mapping Coordinator Ned Swanberg.

### 2014 Grand List<sup>29</sup> -

- Average assessed residential value (and year this is based on): \$203,660
- Assessed value of all residential and commercial property: \$79,255,600
- The total Grand List in the Town of Windham: \$100,127,500
- Common Level of Appraisal: .9566
- Calculated Fair Market Value: \$104,670,186

### Below is a list of the most critical structures in Windham:

- Windham Town Office - 5976 Windham Hill Road
- Windham Town Garage - 6626 Windham Hill Road
- Windham Meeting House, Library, Town Hall and Congregational Church - 26 Harrington Road
- Windham Volunteer Fire Department - 290 White Road
- Windham Elementary School - 5940 Windham Hill Road
- The Windham Elementary School and the Meeting House are the two community shelters.

The Town stores its road equipment at the Town Garage located on Windham Hill Road. A covered salt and sand shed, built in 2000, is located on site. There is a reserve fund for equipment replacement to assist in the purchasing of new equipment for the Highway Department.

## **3. Changes in Development**

There have not been many significant changes to the built environment of Windham in recent years.

### Demographics and Growth Potential

The Town ranks as the fourth smallest town in the Windham Region. The 2010 US Census reported Windham with a population of 419 residents. After experiencing a decrease of over 50% during the first half of the 20th Century, Windham began to experience population growth. From 1970-2010, Windham's population has more than doubled, but remains small at 419 people. Population charts are shown in the Town Profile section of this plan.

In the absence of any real change in the commercial or industrial profile of the community over those 20 years, this cannot be considered the result of economic development. The fact is that Windham has attracted this growth by virtue of its quiet and pristine rural beauty. The growth in population in the last several years has been due to a fairly constant trend of seasonal homeowners becoming full time residents and to new landowners building permanent homes.

### Land Use and Development Patterns

Recent development in Windham has been overwhelmingly residential in nature. Most of this residential development is located along Windham Hill Road or on unpaved secondary roads. It is generally characterized as scattered, low density single family development. There are pockets of more dense residential uses in Windham Center, South Windham and near the former Timberside Ski Area. Because residential properties in Windham do not have public

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<sup>29</sup> Provided by Jerry Dyke. 9/27/14

sewer systems, residences tend to be located where soils are more suitable for individual wastewater disposal systems. About four new residences are built every five years, or less than one home per year. There is not a lot of new construction in Windham.

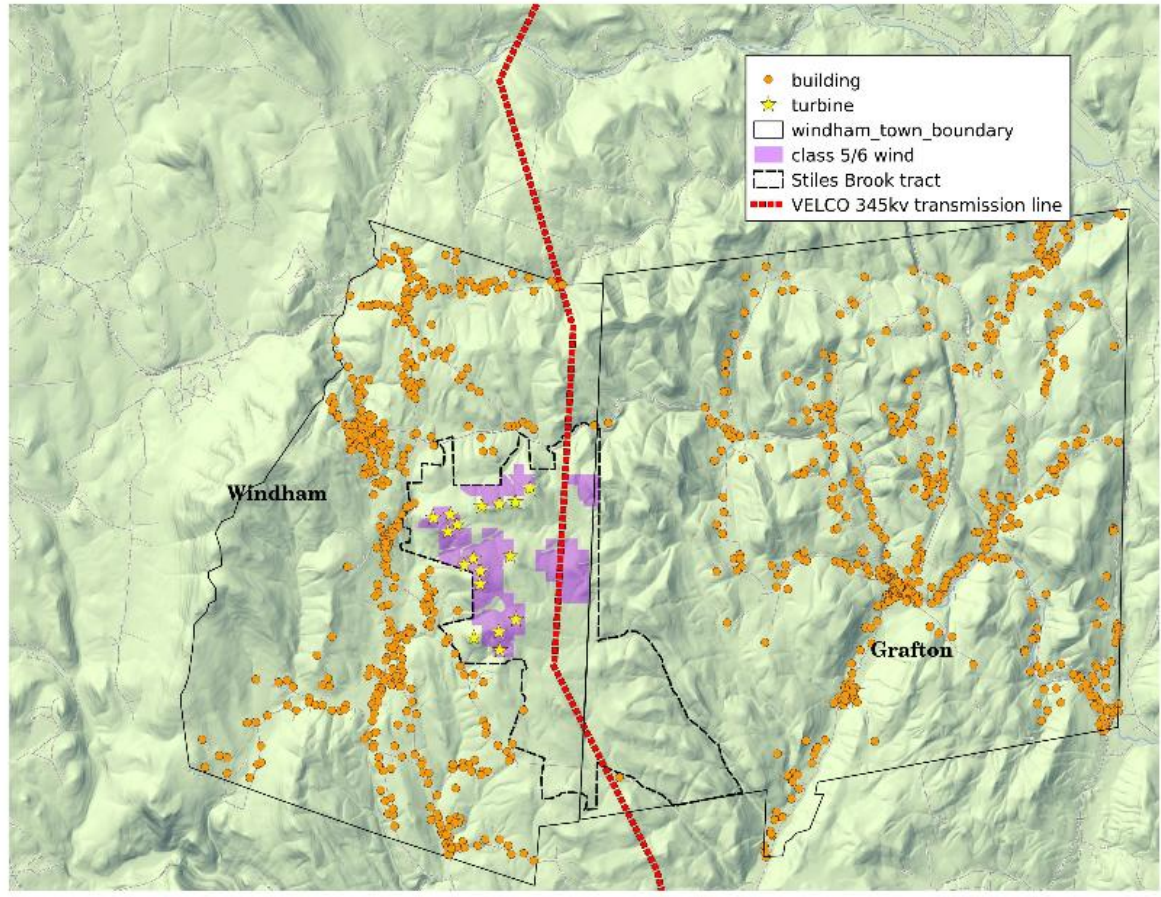
#### Future Land Use

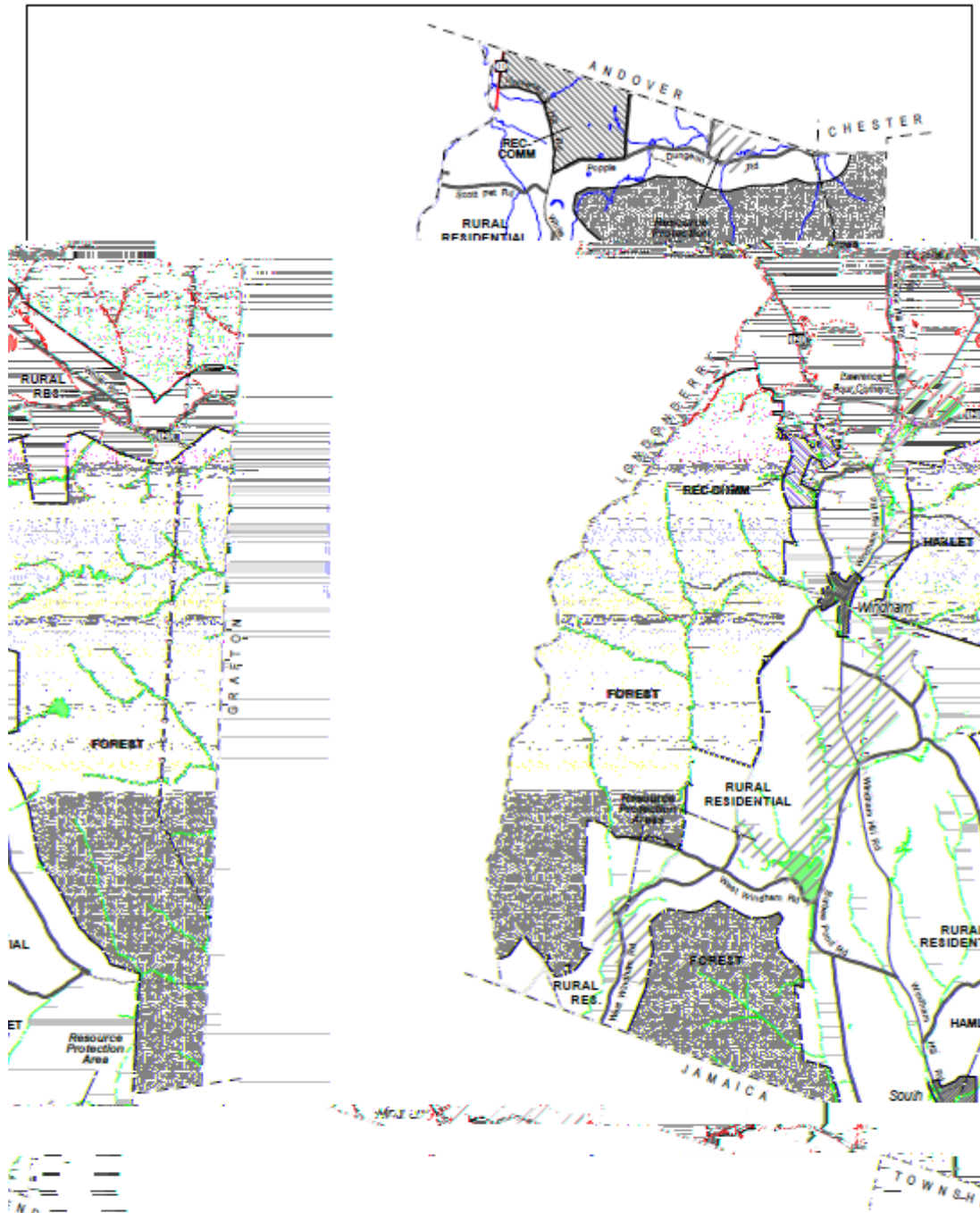
The future land use map is shown at the end of this section of the plan. Future land use is discussed in the 2015 Town Plan. Windham does have zoning regulations. Overall, Windham envisions themselves remaining a rural town dominated by forest land. They want to maintain the existing character and compact development pattern of the historic hamlets of South Windham and Windham Center. They allow for rural residential areas to expand.

#### Potential Wind Development in Windham






The area of Windham known as Stiles Brook is a mountainous area in the eastern part of the town, consisting of about 3,000 acres. It is remote and has little existing development. It serves as a valuable natural area for the region. There is potential for wind development in this portion of Windham and the town has concerns about this development from a number of perspectives, including increased hazard vulnerability. The map below shows the town and the proposed location for the 17-20 wind turbines in Windham. The orange dots on the map are buildings. This proposed development could cause an increase in stormwater, as each turbine has one acre of associated impervious coverage, not including the associated maintenance roadways. An increase in stormwater would impact streams, increasing flood risks and fluvial erosion in Windham and down the watersheds that the headwaters in this area serve.

**Map 4: Location of Buildings and Projected Wind Turbines in the Towns of Windham and Grafton**

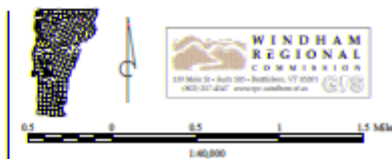




### Future Land Use Areas Town of Windham, Vt. March 2006

-  Recreation-Commercial
-  Forest
-  Rural Residential
-  Forest
-  Resource Protection Area overlay

All use areas were designated by the Town of Windham, Vermont by WRC using existing maps and parcel data.



March 2006, C:\town\WindhamTP\_FULL\_11x17.mxd

## VII. MITIGATION STRATEGY

### A. Goals

The Hazard Mitigation Goals as outlined below were developed by consensus among the Hazard Mitigation Planning Committee during meetings for the development of the Windham local hazard mitigation plan.

Problem Statement 1: There are a large number of undersized culverts in Windham.

Goal 1: Get all culverts up to current standards. This a joint goal between VTrans and the Town.

Problem Statement 2: Fluvial erosion is an ongoing issue in Windham.

Goal 2: Develop fluvial erosion bylaw.

General Ongoing Goals:

- Reduce the loss of life and injury resulting from all hazards.
- Reduce the impact of hazards on the town's water bodies, natural resources, and historic resources.
- Reduce the economic impacts from hazard events.
  - Minimize disruption to the road network and maintain access,
  - Mitigate financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters,
  - Ensure that community infrastructure is not significantly damaged by a hazard event.
  - Being proactive in implementing any needed mitigation projects for public infrastructure such as roads, bridges, culverts, municipal buildings, etc.
- Encourage hazard mitigation planning to be incorporated into other community planning projects, such as the Town Plan, Capital Improvement Plan, and Town Basic Emergency Operation Plan
- Ensure that members of the general public continue to be part of the hazard mitigation planning process.

### B. Excerpted Town Plan Goals & Objectives Supporting Local Hazard Mitigation

Windham just completed updating their Town Plan. Information from the Town Plan was primarily used to gather information for this plan, primarily to aid in developing the Town Profile. Chapter 3, section C of the Town Plan deals with Local Emergency Planning. This section details the emergency planning efforts that Windham engages in. There are policies throughout the town plan that relate to hazard mitigation, whether through land use policies, or actions that the town will engage in. The following policies and actions which support mitigation or relate to hazard planning were taken from the recently updated town plan<sup>30</sup>:

<sup>30</sup> Page 26 of the 2015 Windham town plan, available on the town website: <http://windhamvt.info/>





Windham has enacted a Flood Hazard Bylaw and should continue its enrollment in the National Flood Insurance Program.

2. Require that site plans identify all water features, including but not limited to rivers and streams, wetlands, vernal pools, and lakes and ponds. Use the Zoning Bylaw to require maintenance of undisturbed, naturally vegetated buffers sufficient to protect water quality and other natural resources. Buffer areas, including the depth and type of buffer, shall be shown on the site plan.
3. Require a riparian management plan for development projects and/or where sensitive streams including headwater areas are potentially threatened by development. In cases where buffers are comprised, the Town will institute a “no net buffer loss” standard, meaning that greater buffer areas must be preserved to compensate for areas lost.

**Water Resources Policy 3: Retain wetland areas and vernal pools and their buffers in their natural state for the provision of wildlife habitats, retention areas for surface runoff, recreation and resource value.**

*Action*

1. Require independent field studies to identify and better understand and protect wetlands and vernal pools before permitting any development in forested areas involving or adjacent to wetlands or vernal pools.
2. Study the means and implications of reclassification of Windham’s critical surface waters described in Section 2 Surface Waters.
3. Create a subcommittee to inventory headwaters, wetlands and vernal pools and how the Town can ensure protection into the future.
4. Develop zoning regulations to protect Windham wetlands to the minimum ANR standards.

**Water Resources Policy 4: Stay informed of new State and Federal data and mapping resources related to Flood Hazard Areas and work with downstream communities to mitigate possible flood hazards.**

**Water Resources Policy 5: Windham supports and encourages the use of flow control devices (“beaver deceivers”) in preference to extermination or relocation to maintain beaver flowages whenever the circumstances allow.**

**Land Use Policy 7: Provide sufficient distance to development and populated areas to preserve and protect community health and safety, natural resources, fragile areas, ambient noise levels, air and water quality and property values.**

*Action*

1. Any proposed development in the town shall be evaluated relative to the maps included in this Plan (Chapter XIV) with particular attention to those depicting settlement patterns relative to topography, steep slopes, watersheds, wetland and vernal pools, headwaters, earth resources, land use and viewsheds.
2. Town Selectboard and Planning Commission will undertake educational and out-reach efforts with counterparts in downslope communities regarding the implications of any potential developments in Windham which will impact headwaters or watershed areas.

### **C. National Flood Insurance Program (NFIP) Participation and Compliance**

The National Flood Insurance Program (NFIP) is a voluntary program organized by FEMA that includes participation from 20,000 communities nationwide and 247 Vermont towns and cities. Combined with floodplain mapping and floodplain management at the municipal level, the NFIP participation makes affordable flood insurance available to all homeowners, renters, and businesses, regardless of whether they are located in a floodplain.

The NFIP was instituted in 1968 to make flood insurance available in those communities agreeing to regulate future floodplain development. As a participant in the NFIP, a community must adopt regulations that: 1) require any new residential construction within the 100 year floodplain to have the lowest floor, including the basement, elevated above the 100 year flood elevation; 2) allow non-residential structures to be elevated or dry flood proofed (the flood proofing must be certified by a registered professional engineer or architect); 3) require anchoring of manufactured homes in flood prone areas. The community must also maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed.

In return for adopting floodplain management regulations, the federal government makes flood insurance available to the citizens of the community. In 1973, the NFIP was amended to mandate the purchase of flood insurance as a condition of any federally regulated, supervised or insured loan on any construction or building within the 100-year floodplain. In 2012, Congress passed the Biggert-Waters Flood Insurance Reform Act to reduce subsidies for structures built before the NFIP was instituted (called pre-FIRM structures). Over 50 percent of Vermont's NFIP policies are pre-FIRM, which means that flood insurance premiums for many will increase over the ensuing years.

While the NFIP floodplain management criteria are administered by States and communities through their floodplain management regulations, FEMA's role is to provide technical assistance and to monitor communities for compliance with the minimum NFIP criteria. Windham is a member in good standing with the NFIP (CID 500290). The latest floodplain ordinance was adopted March 9, 2009 and is part of the zoning ordinance.

The latest record indicates that there are five (5) active NFIP policies in Windham. These policies have a total value of \$3,654. There has not been an NFIP claim filed in Windham since 1978. The floodplain administrator in Windham is Frank SeaWright, who is also a selectboard member.

The Town works with the elected officials, Windham Regional Commission, the state and FEMA to correct any compliance issues and prevent further NFIP compliance issues through continuous communications, training and education.

### **D. Mitigation Actions and Projects**

The Windham Hazard Mitigation Plan Committee identified the following hazard mitigation activities based on an evaluation of hazard event vulnerability not addressed by existing hazard

mitigation initiatives and the feasibility of new activities. These projects were defined at the February 12, 2015 public meeting.

Mitigation actions are listed in priority order by hazard. Actions were prioritized by the plan participants, with many factors including finances and funding resources available, vulnerability, risk, and community need. The Mitigation Actions Table contains new actions so any shifts in prioritization of actions came out through the multi-year plan development process. New actions are prioritized in combination with the actions carried forward from the previous plan. The following criteria were used in establishing project priorities. The ranking of these criteria is largely based on the best available information and best judgment as many projects are not fully scoped out at this time. Prioritization was done during the meetings for the plan development in discussions among participants and guided by WRC's Emergency Planner.

- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures or structures critical to town operations?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Is the action legal?
- Does the action offer reasonable benefits compared to its cost of implementation?
- Is the action environmentally sound?

### E. Cost-Benefit Analysis

At the time of applying for FEMA's PDM-C, FMA or HMGP grant programs, each project listed below will undergo full benefit-cost analysis (BCA) methodology, version 4.5 or higher to maximize savings. Whenever possible, Windham will utilize 406 mitigation funding.

As part of public involvement discussions, there was a rough cost/benefit analysis done for each action listed in the table and those results are shown in the table. The below cost and benefits tables address the priorities for the mitigation strategies that are stated in the Mitigation Actions Table.

The Table and Actions (Cost / Benefit) addresses the priorities for the mitigation strategies in the Matrix below. Priorities did not change because the previous plan did not prioritize actions, however progress has been made and completed priorities are indicated.

COSTS	
High	= >\$100,000
Medium	= \$25,000 - 100,000
Low	= < \$25,000

BENEFITS	
High	Public Safety
Medium	Infrastructure/ Functionality
Low	Aesthetics/ General Maintenance

## F. Mitigation Actions Table

HAZARD	ACTION	RESPONSIBLE PARTY	TIME-FRAME	FUNDING SOURCE	MITIGATION OR PREPAREDNESS	COST / BENEFIT	PRIORITY	STATUS
Flood/Flash flood / Fluvial erosion	Upsizing White road (TH 9) culvert to 48" CMP - to meet current Codes and Standards - currently its 30" culvert	Road commissioner and Vtrans	Spring to fall 2015 begin and end	Structures grant from Vtrans 90% / 10% Town	Mitigation	High/ Medium	High	Budget and funding requested, hydraulic study completed
Flood/Flash flood / Fluvial erosion	Upsize Abbott road (TH 17) culvert to a proposed 10' x 6' box culvert - currently a 6' corrugated steel culvert, undersized and rotted out	Road commissioner and Vtrans	Spring to fall 2016 begin and end	Structures grant from Vtrans 90% / 10% Town	Mitigation	High/ Medium	High	Budget and funding requested; hydraulic study completed
Flood/Flash flood / Fluvial erosion	New bridge on Rte 121 (TH 2) - Bridge 5 - Proposed 16' x 7' bridge or box culvert - currently a 6' corrugated steel pipe exists (culvert 25), undersized, washed out multiple times	Road commissioner and Vtrans	Spring to fall 2016 begin and end	Structures grant from Vtrans 90% / 10% Town	Mitigation	High/ Medium	High	Budget and funding requested; hydraulic study completed
Flood/Flash flood / Fluvial erosion	New bridge 22 on Mercy Lane (TH 9) - proposed 20' x 7' bridge - currently a 6' corrugated steel culvert exists (culvert 1), alignment is poor, washed out multiple times, undersized	Road commissioner and Vtrans	Spring to fall 2017 begin and end	Structures grant from Vtrans 90% / 10% Town	Mitigation	Medium/ Medium	High	Budget and funding requested; hydraulic study
Flood/Flash flood / Fluvial erosion	Bridge 14 deck and abutment work on Rte 121 (TH 2) - existing 10' x 6.3' structure	Road commissioner and Vtrans	Spring to fall 2015 begin and end	Structures grant from Vtrans 90% / 10% Town	Maintenance	Medium/ Medium	High	Budget and funding requested; waiting for HEC-RAS review prior to and further engineering work
Extreme cold / winter storm	Educate town residents on safe use of generators to prevent safety issues through article in News and Notes	Selectboard Chair	This will be in the March-April 2015 issue	Town funding	Mitigation	Low/High	High	Article is development now for upcoming issue.

HAZARD	ACTION	RESPONSIBLE PARTY	TIME-FRAME	FUNDING SOURCE	MITIGATION OR PREPAREDNESS	COST / BENEFIT	PRIORITY	STATUS
Extreme cold / winter storm	Develop management structure for handling the existing emergency shelter and a phone tree for use during emergencies.	Emergency Shelter Manager	Begin Spring 2015 and end Dec 2015	Town funding	Mitigation	Low/High	Medium	This is in discussion now.
Wildfire/ Structure Fire	Town Highways 6 and 3, Volunteer Fire Company is located on Town Highway 3 and this road sees a lot of damage from frost heaves. These roads need repaved for safe passage of the fire trucks. Action is repaving these roads.	Road commissioner	Begin and end Summer 2016	Vtrans Roads and Structures grant	Maintenance	High/High	High	The grant has been received for this repaving.
Wildfire/ Structure Fire	Replace 30 year old fire truck for a new truck with a higher capacity for holding water.	Fire Chief or President	Has been ordered, delivery unknown	Town and Fire Department and Loan	Mitigation	High/High	High	This is in discussion now, decisions to be made in April 2015 and truck will be ordered soon after that.
Wildfire/ Structure Fire	Article in News and Notes stating that burn permits are required and why. Burn permits are not always gotten, so people may not be aware of their need.	Marsha Clinton on the Fire Department	Spring 2015 for May/June issue	Town budget	Mitigation	Low/High	Medium	Marsha has been working on this article.
Flood/Flash flood / Fluvial erosion	Development of fluvial erosion bylaw	Selectboard and WRC	Summer to Fall 2015	Town budget / WRC dues	Mitigation	Low/High	High	Awaiting updated state models
Flood/Flash flood / Fluvial erosion	Landowner outreach to provide knowledge and tools for them to make decisions for better flood resiliency. Windham is working with Grafton, Bellows Falls and Westminster are working together on this.	Selectboard and WRC	Application due May 2015 / Summer 2015 begin-end of 2016	High Meadows Grant	Mitigation	Low/ Medium	Medium	Grant application approved; The towns will be meeting and figuring out how to utilize the funds among themselves.

HAZARD	ACTION	RESPONSIBLE PARTY	TIME-FRAME	FUNDING SOURCE	MITIGATION OR PREPAREDNESS	COST / BENEFIT	PRIORITY	STATUS
Flood/Flash flood / Fluvial erosion	Develop a maintenance program for culvert checks and cleanouts, for prioritizing culvert projects.	Road foreman and Frank Seawright	Oct 2014 began - end Fall 2015	Town budget	Mitigation	Low/ Medium	High	That article is development now for upcoming issue. Road Foreman is working on this. There are a number of culverts that need upsizing and replacing.
Extreme cold / winter storm	News and Notes article about letting faucets drip to avoid pressure buildup and bursting pipes.	Selectboard Chair	March-April 2015	Town funding	Mitigation	Low/High	High	This has been a known issue for years and the town is saving slowly.
Wildfire/ Structure Fire	Relocate Fire Company to more central location in Windham. Consolidation of the town garage in one location would be ideal. Current location is in the very north of town and leads to longer response times.	Fire Company	begin 2016 and end 2019	Donations and Town funding; hopefully grants	Mitigation / Preparedness	High/High	Medium	The town is developing a schedule for equipment replacement. This project has been discussed for years, but funding is an issue. New location will lead to better response times townwide.
All Hazards	Town highway heavy equipment needs upgraded. Grader is inadequate for the terrain of the town. Loader is getting to the end of its useful life. Inadequate equipment means that they can't access all areas of the town.	Road Commissioner	Begin Spring 2015 and end Spring 2015	Unknown, will be seeking grants	Preparedness	High/ Medium	Medium	Searching for grants. This is a recognized need.
All Hazards	Town shelters are inadequate for long term use. There is a kitchen in one shelter but no showers, and showers in the other shelter but no kitchen. There is also no generator for the meeting house shelter.	EMD and Shelter Manager	Summer 2016 to Summer 2017	Town and emergency grants	Mitigation/ Preparedness	Medium/ High	Low	In discussion now with selectboard

HAZARD	ACTION	RESPONSIBLE PARTY	TIME-FRAME	FUNDING SOURCE	MITIGATION OR PREPAREDNESS	COST / BENEFIT	PRIORITY	STATUS
All Hazards	Open up connection between Old Farm Road and Ingalls Road, which has been left to go rough. Ingalls Road has a steep grade at the bottom so this would be a secondary out for houses on that road. Road crew could cut down vegetation and bring in material to make the road passable by a truck.	Road Commissioner	Summer 2016 begin and end	Town	Mitigation / Preparedness	Low/High	Medium	In discussion now with selectboard
Winter Storm / Fire	Relocate town garage, preferably to a new building that can consolidate and house both the town garage and the fire company. Issue is that there is inadequate storage of equipment for fire company, inadequate storage of items needed for emergency shelters in town, currently no isolation area in town, and better facilities are needed for housing crew members overnight for emergency maintenance in early hours during snow storms. Current buildings are inadequate and roof needs to be replaced on current town garage anyway.	Selectboard; Fire company; Road Foreman	Initial steps taken in Summer 2015; completion expected Fall 2018	USDA low interest loan	Mitigation / Preparedness	High / Medium	High	USDA Rural Development has met with the town about getting a low interest loan. Potential locations have been looked at; town lawyer has been consulted. Next step is to acquire property and proceed with building design.

## G. Implementation Capabilities

Windham has numerous capabilities and limiting factors that will impact implantation of this plan. These factors will be addressed generally and are not specific to carrying out any individual actions.

The biggest factor in Windham is the small population. With a bit over 400 residents, and an aging resident base, this is a fact of the matter in Windham. Additionally, 60% of residents are part time residents who own other homes elsewhere, as well. This is not seen as a “problem” in Windham, it is just the makeup of the community. They are a tight knit group of residents and there is a strong core group of local officials who do a lot for the town. The amount of participation and attendance at the two public meetings for putting this plan together speak volumes about the importance that residents feel about their community. Those who choose to be involved are very engaged and give back with their time, resources, and know-how. Due to the rural and self-sufficient nature of Windham, there are a large number of residents with emergency generators, 4-wheelers, chain saws, and other heavy equipment, event excavators. And these residents are able and willing to assist in emergencies. There is a good community spirit and people help each other out. The town has a spreadsheet inventorying privately owned equipment that can be used in an emergency. They also have an active volunteer fire company, selectboard and planning commission. They have a shared EMD position, but the only town staff member is a part-time town clerk. Additionally, a factor based on their mountainous terrain is that they don’t have high flooding problems like some of their downstream neighbors, for the simple fact that they are at a higher elevation in the watershed so they have limited damage potential.

The primary limiting factors in Windham are the limited town budget and difficulty getting volunteers outside of the core group of those who generally already participate. Poor cell/radio communications are also an issue that can lead to frustration and danger in certain circumstances.

## VIII. Incorporation of Mitigation into Other Town Planning Mechanisms

The following policies, programs and activities related to hazard mitigation are currently in place and/or being implemented in the Town of Windham. The Hazard Mitigation Planning participants analyzed these programs for their effectiveness and noted improvements needed. Windham uses all of the tools listed below to help plan for current and future activities with the town. For example: the Local Emergency Operation Plan has a contact list that is used for response purposes in the case of a hazard event, and is updated every year after Town Meeting. Town Road and Bridge Standards are followed by the town and Windham updated their culvert inventory in 2012. In the development of this plan, the latest 2015 Town Plan was used. The previous hazard mitigation plan was not integrated into the town plan or other planning mechanisms in place in Windham. This is something that was not on the town’s radar at that time, but is now. There are a number of people in town that are involved in planning, and many people are involved in more than one committee, so integration of ideas is happening.

As Windham goes through the update process for the planning mechanisms outlined in the table below, they will look to the Hazard Mitigation Plan’s Table of Actions and Risk and Vulnerability Assessments to help guide land use district decisions, and guide goals and policies for those districts. They have agreed to this. At the Town Meeting every March, policies and action items in the Town Plan are reviewed and integrated into hazard mitigation as needed. The Local Emergency Operations Plan contact list is updated after Town Meeting each year, including updates to vulnerable geographic locations, as well as locations of vulnerable populations. Updates to each of the planning mechanisms outlined in the table below are handled by the identified by the responsible party identified in the table. There is no timeframe for updating the below referenced plans and regulations to better incorporate hazard mitigation, however, as each document is updated the hazard mitigation plan will be reviewed for incorporation. The goals of this hazard mitigation plan will be incorporated in the upcoming town plan



update to ensure that emergency preparedness and mitigation planning efforts are included in the Town Plan, with particular attention to including the projects in the Mitigation Actions Table. This will assist with ensuring that this plan is utilized and project follow-through occurs.

During the recent update of the Town Plan, Windham addressed flood resiliency and preparation. The hazard mitigation plan will be considered and incorporated as appropriate in the next town plan update. The next time the floodplain ordinance is updated, it will be encouraged that that update include a Fluvial Erosion Hazard bylaw. The LEOP is updated yearly and was updated last in 2014. Other mitigation/emergency planning related documents and their status are outlined in the below table:

Type of Existing Protection	Description	Effectiveness/Enforcement/Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
Town Plan	Plan for coordinated town-wide planning for land use, municipal facilities, etc.	Flooding Addressed	Town Plan adopted January 5, 2015, awaiting approval
Town Local Emergency Operations Plan	Municipal procedures for emergency response	Incident Command; Hazard Annexes included	Completed and adopted by Town Select Board 2014
School Emergency Response Protocol	School procedures for emergency response	School Crisis Plan adopted March 2009	School Crisis Planning Team and administration should meet with town officials, and law enforcement to discuss protocol, evacuation, and information sharing policies
LEPC 6 Hazardous Materials Plan	Procedures for hazmat emergency response at regional level	LEPC 6 has the plan	Continued involvement with the LEPC
Mutual Aid – Emergency Services	Agreement for regional coordinated emergency services	Keene (NH) Mutual Aid – written agreement/contract for Fire/Ambulance and HazMat; Londonderry Fire and Rescue for rescue service and assistance with fire	None identified
Road Standards	Design and construction standards for roads and drainage systems	2013 Vtrans Town Road and Bridge standards adopted	No major gaps identified
Zoning Regulations	Regulates the division of land, standards for site access and utilities	Adopted August 2011, currently being revised	Revising natural resources chapter to address flooding, fluvial erosion, and watersheds
Sewage Regulations	Regulates on-site sewage systems	State Regulations apply	None Identified
Flood Hazard Area Regulations	Regulates development in SFHA	NFIP member in good standing; updated bylaw September 2007 in conjunction with new	Interim river corridor bylaw is only valid until Oct 2016

Type of Existing Protection	Description	Effectiveness/Enforcement/Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
		FIRM	
Maintenance Programs	Bridge & Culvert Inventory	Updated in 2012	Town is digitizing roads now and developing internal check system
Building Code	Regulates building construction standards	Through Labor and Industry	NA
Wetland protection - VT Wetland Rules	Protected by 1990 Vermont Wetland Rules and Town Zoning (buffer zones required around wetlands)	Protection of environment, water resources, wildlife, biota	None Identified

## IX. APPENDIX

- A. Prerequisite - Adoption by Local Governing Body
- B. Sample invitation letter that went to 10 residents invited to join the Hazard Mitigation Planning Committee (three invitations were extended via phone call)
- C. July 14, 2014 First meeting agenda
- D. July 14, 2014 Meeting sign in sheet
- E. Hazard Ranking Table used at July 14, 2014 meeting
- F. Newspaper advertisement for February 12, 2015 Hazard Mitigation Planning Committee second meeting
- G. Flyer for February 12, 2015 Hazard Mitigation Planning Committee meeting. Flyer was posted at various locations in Windham.
- H. Sign-in sheet for February 12, 2015 Hazard Mitigation Planning Committee meeting
- I. Agenda for February 12, 2015 Hazard Mitigation Planning Committee meeting
- J. News and Notes article regarding Hazard Mitigation plan development - September/October 2014 issue
- K. News and Notes article regarding Hazard Mitigation plan in January/February 2015 issue
- L. Flyer advertising the draft plan for public comment. Flyer was posted around town from March 2-March 16, 2015.
- M. Email sent to adjacent towns soliciting comment on the draft plan
- N. News and Notes article regarding Hazard Mitigation plan in March/April 2015 issue
- O. Pictures of August 3, 2003 Flooding in Windham - pictures provided by Paul Wyman
- P. Photos of Damage in Windham during and after TS Irene (August 2011) - Photos provided by Heath and Mary Boyer
- Q. Website posting of draft plan for public comment (posted 2/26/15-3/16/15)
- R. Email sent to Windham Hazard Mitigation Committee, soliciting comment on the draft plan

A. PREREQUISITE

Adoption by the Local Governing Body

**Certificate of Adoption**  
Town of Windham, VT  
Selectboard

**A Resolution Adopting the Town of Windham Local Hazard Mitigation Plan**

WHEREAS, the Town of Windham, VT has worked with the Windham Regional Commission to identify natural hazards, analyze past and potential future damages due to natural disasters, and identify strategies for mitigating future damages; and

WHEREAS, The Town of Windham, VT Local Hazard Mitigation Plan analyzes natural hazards and assesses risks within the community; and

WHEREAS, the Town of Windham, VT Local Hazard Mitigation Plan recommends the implementation of action(s) specific to the community to mitigate against damage from natural hazard events; and

WHEREAS, the Town of Windham, VT authorizes responsible agencies to execute their responsibilities to implement this plan for the purposes of long term risk reduction and increased community resiliency and;

WHEREAS, the Town of Windham, VT will follow the Plan Maintenance Process outlined in this plan to assure that the plan stays up to date and compliant; and

NOW, THEREFORE BE IT RESOLVED that the Town of Windham, VT adopts the *Town of Windham Local Hazard Mitigation Plan* as well as future revisions and maintenance required by 44 CFR 201.6 and FEMA for a period of five (5) years from the date of this resolution.

Duly adopted this \_\_\_\_\_ day of \_\_\_\_\_.

*day*

*month, year*

Selectboard

\_\_\_\_\_  
Mary Boyer, Chair

\_\_\_\_\_  
Frank Seawright

\_\_\_\_\_  
Kord Scott

ATTEST

\_\_\_\_\_  
*Alison Trowbridge, Town Clerk*

B. Sample invitation letter that went to 10 residents invited to join the Hazard Mitigation Planning Committee (three invitations were extended via phone call)

**Town of Windham**  
Hazard Mitigation Committee  
5976 Windham Hill Rd.  
Windham, VT 05359  
802-874-4211  
July 7, 2014

Dear John,

revision as required by FEMA. In this job must be completed as soon as possible. A representative of the Windham Hazard Mitigation Committee is starting work on the necessary revisions on Monday, July 14<sup>th</sup> at 6:00 at the

potential hazards within the town which are not currently identified. We also seek any suggestions for how these hazards can be eliminated.

participation is very important to us. We

Windham's 2008 Hazard Mitigation Plan is due for revision in order to continue to be eligible for FEMA funding through the Regional Commission and other interested parties is invited to participate in the revisions. The committee will have its first meeting on Monday, July 14<sup>th</sup> at 6:00 at the Town Office.

We are seeking input from you to help identify potential hazards that threaten safety, infrastructure and/or natural or historical resources. We also seek any suggestions for how these hazards can be reduced or eliminated.

This meeting will not be a long one and your participation is very important to us. We hope you will make every effort to attend.

Sincerely,  
The Windham Select Board

C. July 14, 2014 First meeting agenda

**Hazard Mitigation Plan – Update & Plan Development**  
**Windham Town Office – July 14, 2014**

**Agenda**

Plans

- a) Purpose
- b) Process
- c) Multi- v. Single Jurisdiction
- d) Role of WRC (Alyssa)

**2. Review of Current Hazard Mitigation Plan Annex (Adopted 02/02/2009)**

Power Failure and

- a) Key Threats: Flash Flood, Winter Storm/Ice Storm, Wildfire/Structure Fire, Power Outage, High Wind
- b) Review Mitigation Actions from Windham’s 2008 Plan (Status Update)
- c) Discuss Existing Hazard Mitigation Projects, Programs & Activities

**3. Hazard Identification**

- a) Rank Hazards Based on Hazard Ranking System (using worksheet)
- b) Discuss The Results
- c) Determine Which Hazards to Focus on in the updated Hazard Mitigation Plan

**4. Next Steps**

- a) Draft Plan – updated template to be developed per FEMA comments
- b) Meet to Review and Discuss First Draft
- c) Develop Hazard Mitigation Strategies for “Top Hazards”
- d) Food for Thought: Involving the Public & Public Outreach

D. July 14, 2014 Meeting sign in sheet

**Windham, VT - HAZARD MITIGATION PLAN MEETING**  
**July 14, 2014**  
**Location: Windham Town Office**

**SIGN IN SHEET**

Name	Affiliations – Please list all	Town where you live
Kozzo Scott	SELECTMAN	WINDHAM
Frank Seawright	Select-One	Windham
Marcia Clinton	Health Officer	Windham
John Hoover	Library Trustee	Windham
PETER McDONALD	ENERGY COORDINATOR	WINDHAM
MARY BOYER	SELECT BOARD	WINDHAM
PETER CAMBERLIN	TREASURER	WINDHAM
ROBERT BINGHAM	Planning Commi-	Windham.
Imme Maurath	Co-EMD	Windham
Heath Boyer	Co-EMD	Windham
Dona Robinson	WCO	Windham
Paul Wynn	FIRE Co.	Windham
Pete Newton		Windham
John Lindsey	Planning Commission member	WINDHAM
MIKE MCLENNAN	FIRE CO	WINDHAM

E. Hazard Ranking Table used at July 14, 2014 meeting

<b>HAZARD RANKING</b>				
<b>Hazard</b>	<b>Frequency of Occurrence</b>	<b>Warning Time</b>	<b>Potential Impact</b>	<b>Hazard Score</b>
Flash Flood/Flood/Fluvial Erosion				
Severe Weather (Thunderstorm, Lightning, High Wind, Hail, and Flooding)  *Note: We have defined 'Severe Weather' to include two or more of the above hazards.				
Hail Storms				
Landslides/Mudslides/Rockslides				
Hurricanes/Tropical Storms				
Wildfire				
Extreme Cold/Snow/Ice Storm				
Structure Fire				
Water Supply Contamination				
Dam Failure				
Ice Jams				
Drought				
Earthquake				
Hazardous Material Spill				
Extreme Heat				
Tornado				
Invasive Species/Infestation				
Tsunami (Vermont is landlocked.)				
Volcano (Vermont has no active volcanoes.)				



F. Newspaper advertisement for February 12, 2015 Hazard Mitigation Planning Committee second meeting

**Brattleboro Reformer**  
Brattleboro, Vermont

Home News Lifestyles Sports Opinion Entertainment Obituaries Publications

**PUBLIC NOTICES** [Home](#)

**TOWN OF WINDHAM A PUBLIC MEETING FOR THE WINDHAM HAZARD**

TOWN OF WINDHAM A Public meeting for the Windham Hazard Mitigation Plan update will be held on Thursday, February 12th, 2015, from 4:00-6:00 PM, at the Windham Town Office at 5976 Windham Hill Road, Windham, VT. Alyssa Sabetto, from the Windham Regional Commission, will be sharing the draft hazard mitigation plan and gathering ideas for mitigation actions that the town would like to pursue. The public is encouraged to attend. For more information contact Allison Towbridge at 874-4211 or Alyssa Sabetto at 257-4547 ext 109 01/26/15

Appeared in: *Brattleboro Reformer* on Monday, 01/26/2015

G. Flyer for February 12, 2015 Hazard Mitigation Planning Committee meeting. Flyer was posted at various locations in Windham.

## **Windham Hazard Mitigation Plan Public Meeting Announcement**



When: Thursday, February 12, 2015

Time: 4:00-6:00 PM

Where: Windham Town Office

5976 Windham Hill Road, Windham

This meeting will provide an opportunity to share idea for mitigation actions. What actions can Windham take to lower vulnerability to natural hazards?

For more information contact

Alyssa Sabetto at 802-257-4547 x109

H. Sign-in sheet for February 12, 2015 Hazard Mitigation Planning Committee meeting

Windham, VT - HAZARD MITIGATION PLAN MEETING February 12, 2015 Location: Windham Town Hall <b>SIGN IN SHEET</b>		
Name	Affiliations - Please list all	Town where you live
Seawright, Frank	Town of Windham - Select Board MBR fseawright@VERMONTTEL.NET	Windham
MARY BOYER	Select Board	WINDHAM
Imme Maurath	Co-EMD	Windham
Heath Boyer	Co-EMD	
Robert Bingham	Plan/Comm.	Windham
Peter Chamberlain	Treasurer, Conservation Comm. windham.towntreasurer@gmail.com	Windham
KARL SCOTT	SELECT BOARD pete@petenewton.com	WINDHAM
Pete Newton	Resident	Windham
PETE McDONALD	RESIDENT	WINDHAM
Marcia Clinton	Health Officer mclinton@vermontel.net	Windham
Margaret Dwyer	Resident selectboard 2 @ earthlink.net	Windham

I. Agenda for February 12, 2015 Hazard Mitigation Planning Committee meeting

**Hazard Mitigation Plan – Development of Mitigation Actions  
Final Meeting for the Development of the  
Windham Hazard Mitigation Plan  
Windham Town Office – February 12, 2015  
4:00-6:00 PM**

**Agenda**

**1. Update on the Progress of the Hazard Mitigation Plan**

- a) Review of what's been done to date

**2. Review of Hazards Profiled**

- a) Key Threats: Flooding, Winter Storm/Ice Storm, Wildfire/Structure Fire, High Winds and Landslide
- b) Are landslides an issue in Windham? Areas of landslide occurrence?

**3. Develop Mitigation Actions**

- a) Complete Mitigation Actions Table
- b) Discuss existing/ongoing Hazard Mitigation Projects, Programs & Activities

**4. Last Questions**

- a) Review of past occurrences of hazard events – are lists complete?
- b) Gaps and capabilities to carry out mitigation actions
- c) Anything missing or other comments on the draft?

**5. Next Steps**

- a) Share complete draft with committee for internal comment
- b) Put out for public comment
- c) Send to adjacent towns for comment
- d) Send final draft to DEMHS/FEMA for review

J. News and Notes article regarding Hazard Mitigation plan development –  
September/October 2014 issue

Page 2 —September-October 2014

Windham News and Notes

**SELECTBOARD NEWS**

*Mary Boyer, Frank Seawright, Kord Scott*

Town Treasurer Peter chamberlain and our road crew have been focusing on expense reduction by increasing our buying power with vendors, and sometimes changing vendors. Their efforts are paying off and all departments, including roads continue to operate under budget. All loans have been paid off except for payments on the truck and backhoe. Sand and salt are being stockpiled for the winter months while the prices are still reasonably low. We are pleased to say the Fire Co. has offered to help the road crew clean culverts and bridges with water pressure from their trucks.

The micro-burst of rain on July 27th caused about \$210,000 worth of damage to several of our roads, with a major washout to Horsenail Hill Road. We are currently working through the application process with VTrans to participate in the state funding for emergency repairs. Unfortunately, the incident was too small to trigger FEMA reimbursement.

We are still working with various agencies to implement a motion to reduce the speed limit in the hamlet of South Windham to 30 mph. The reduced speed will be from the southern boundary with Jamaica which runs through Ed Brown's barn to a northern boundary of just south of Wheeler Road. Warning signs of the speed change will be posted in both directions.

The Planning Commission will be completing their work on the Town Plan by the end of August and will be sending it to us for review and additional hearings. This comprehensive document is an important statement of the goals, policies and community standards of the Town of Windham. Community participation is an important component of a Town Plan and we encourage all residents and property owners to attend the hearings or write to us with comments. Copies of the Commission's final draft plan are available at the town office.

Updating our Town's Hazard Mitigation Plan to conform to new FEMA standards is well un-

derway. We greatly appreciate the work of the committee of volunteers. Imme Maurath, Emergency Co-Director has taken on the task of working with the Regional Commission to report out the work of the committee and articulate a plan that adequately identifies potential hazards and action steps to prevent future damage to our roads and homes.

We are also attempting to codify some of the policies that have been in place a long time but which have never been officially written down and available in one location. This situation has led to some inconsistencies, confusion, and misunderstandings. Please note that the following is the official policy of the town regarding resident usage of road materials stockpiled in the town shed:

**POLICY: Use of Road Materials**

**Road materials, including sand, salt, gravel, shur-pak, and stone are for the maintenance of Town roads and rights of way. These materials are not for the use of residents for maintenance of their driveways. Sand may be used for sidewalk and driveway safety. Buckets or pails of sand may be taken. Filling up pickup trucks and other vehicles is not allowed.**

The arrival of the electronic age has brought with it many challenges and opportunities. All town employees are required to improve their computer skills to meet the new demands. Frank has been creating a computer program that will enable us to keep track of all our roads, their surface conditions, when they were last maintained/repared, materials used, man hours spent, equipment used, etc. This computerization will enable us to budget more accurately, and will help the road crew to plan their work schedules more efficiently.

As summer draws to an end, we hope that you have enjoyed the long days, that your gardens have been prolific, and that you have stacked that firewood.

\*\*\*\*\*

K. News and Notes article regarding Hazard Mitigation plan in January/February 2015 issue

Page 8 —January-February 2015

Windham News and Notes

**Plan Prepares Windham to Mitigate Natural Hazards**

*by Heath Boyer*

Since midsummer of 2014 an ad hoc committee in town has been working with the Windham Regional Commission to update our Local Hazard Mitigation Plan (LHMP). The update is needed because of a change in FEMA regulations affecting reimbursement eligibility for disaster recovery. Unless the LHMP meets a very strict set of standards, the town could lose its ability to qualify for reimbursements for expenses such as were incurred during Irene and more recently during the “microburst” that inundated parts of White Road and Horsenail Hill Road in September of 2014.

Until this year Vermont towns, including Windham, had LHMPs that were “annexed” to the Regional Hazard Mitigation Plan. The new FEMA rules, however, require that each town create its own, stand-alone plan. Further, the rules require that the plan be developed using widespread community input and that the process be well documented regarding public participation.

On July 14 a diverse group of Windham residents met with the Select Board, Co-Emergency Management Directors Imme Maurath and Heath Boyer, and Alyssa Sabetto, the staff support person from the Windham Regional Commission. In a round-table exercise the group identified major potential hazards based on their personal observations and local knowledge of hazards and historical occurrences. This information has now been incorporated into the LHMP draft.

The principle hazards identified in the exercise were the familiar ones -- flash floods, winter storms, wildfire and structure fire, power failure, and high wind. There were also two other potential hazards added to the list -- landslides and beaver dams. These items were included because of our recent experiences with extremely heavy rainfall, well beyond what has been normal in the past. We are told that climate change will result in more and more occurrences of this type, and the group felt that saturated ground in mountainous areas could be destabilized and create slides. Two occurrences of large beaver dam failures in nearby towns following heavy rainfall and the identification of some large beaver impoundments in Windham led to that addition to the list.

Residents who participated in the initial meeting included Bob Bingham and John Lingley of the Planning Commission; Marcia Clinton, town health officer; Paul Wyman and Michael McLain of the Windham Volunteer Fire Company; Peter Chamberlain, town treasurer; Alison Trowbridge, town clerk; and Dona Robinson, Windham Community Organization.

Any residents or property owners who have an interest in identifying and mitigating potential hazards of any kind are welcome to participate in future meetings or to express their views or ideas by contacting anyone on the committee or by emailing the town clerk at [windham.town@gmail.com](mailto:windham.town@gmail.com) with the subject ‘Hazard Mitigation’.

L. Flyer advertising the draft plan for public comment. Flyer was posted around town from March 2-March 16, 2015.

## Windham Hazard Mitigation Plan

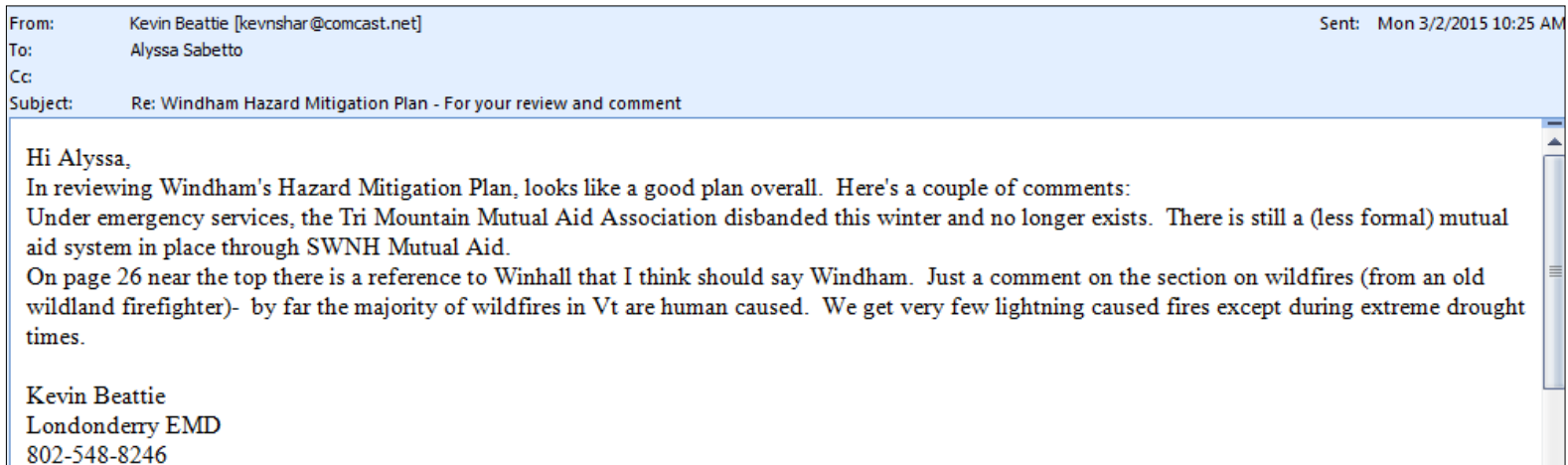
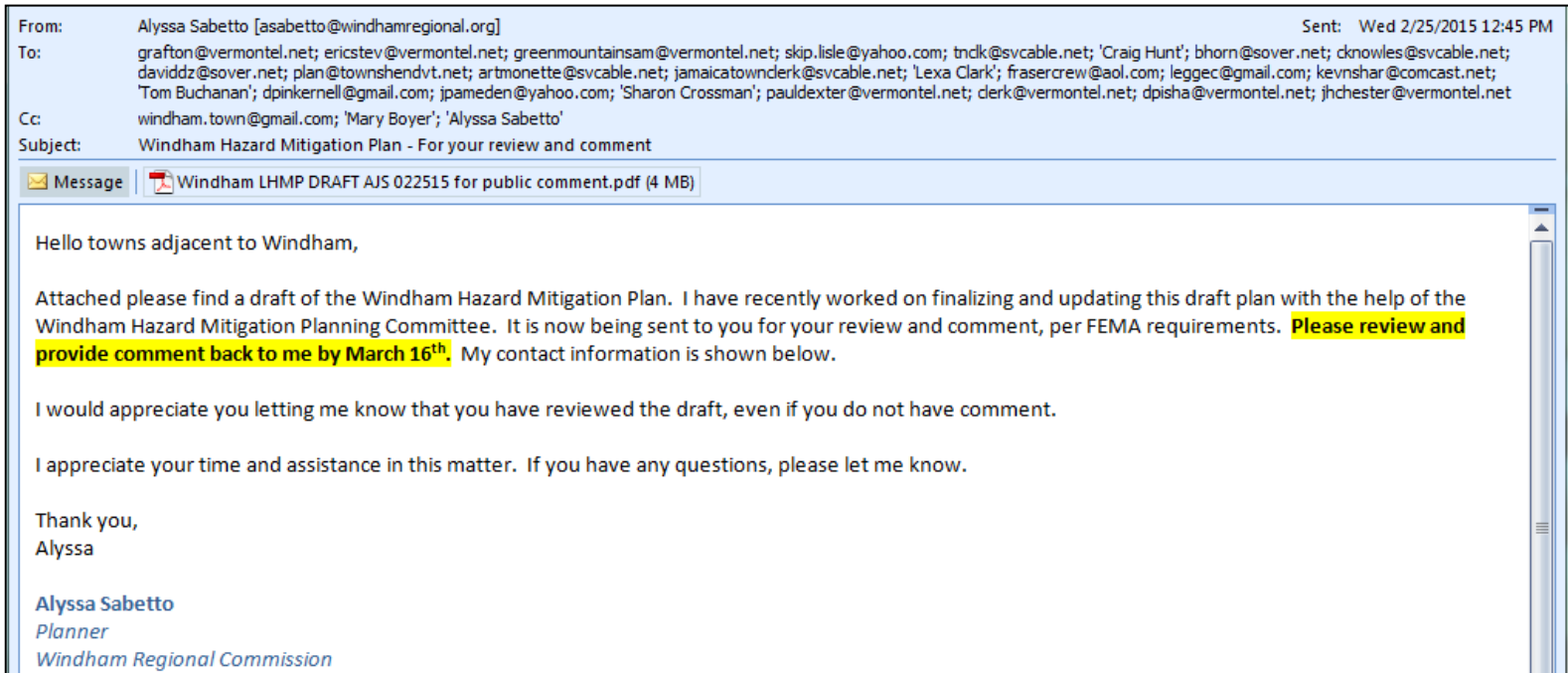
The draft Windham Hazard Mitigation Plan is now available for public review at the Windham Town Office and on the citizens operated website [www.windhamvt.info](http://www.windhamvt.info)



The Plan will be available for comment until the end of the public comment period on March 16, 2015.

Anyone who would like to comment on the plan should contact Alyssa Sabetto at the Windham Regional Commission. She can be reached via phone at 802-257-4547 x109 or email at [asabetto@windhamregional.org](mailto:asabetto@windhamregional.org). We encourage your review and participation!

## M. Email sent to adjacent towns soliciting comment on the draft plan





N. News and Notes article regarding Hazard Mitigation plan in March/April 2015 issue

Windham News and Notes

Page 9 —March-April 2015



Burbee Pond February 2015

**Hazard Mitigation Plan Update** by Heath Boyer

On Feb 12 Windham’s Committee updating the 2008 Local Hazard Mitigation Plan met with the Select Board and Alyssa Sabetto, WRC Staff expert on Emergency Planning. Attending were Bob Bingham, Peter Chamberlain, Pete Newton, Pete McDonald, Marcia Clinton, Heath Boyer, Imme Maurath, and Margaret Dwyer.

Alyssa presented a draft and the group discussed the key threats to Windham as identified at the earlier meeting: Flooding, Winter Storms & Ice Storms; Wildland and Structure Fires, High Winds and Landslides. In the first meeting the group was given a list of possible hazards and asked to force-rank them for likelihood of occurrence in Windham. Initially there was agreement that landslides belonged on the list. After further discussion however it was agreed that while erosion of creek banks during high water events created some collapsing of banks, these situations did not qualify as landslides in the usual sense.

anticipate and prepare for possible hazardous events is a major component of mitigation. Several topics were selected for future discussion in the News and Notes and town meetings.

The Plan is in its final stages of revision and will be available for review in the Town Office and will be posted on the Citizens’ website [windhamvt@info.com](mailto:windhamvt@info.com). Click on Windham LHMP.

The Select Board and Planning Commission are grateful to all of those who volunteered their time and offered thoughtful suggestions to this important process. The Plan requires an annual review and must be updated fully every five years. All suggestions for future editions can be offered in writing to the Town Clerk who will forward it to the proper people.



The group began work on identifying hazards on the list and identified possible means of mitigation. FEMA’s new rules for Local Hazard Mitigation Plans require at least two mitigation actions for each identified hazard. The group emphasized that education and communication regarding how individuals and property owners can

www.mvbooks.com 802 875 3400  
Lynne and Bill Reed, booksellers

O. Pictures of August 3, 2003 Flooding in Windham – pictures provided by Paul Wyman



Headwaters of Williams River

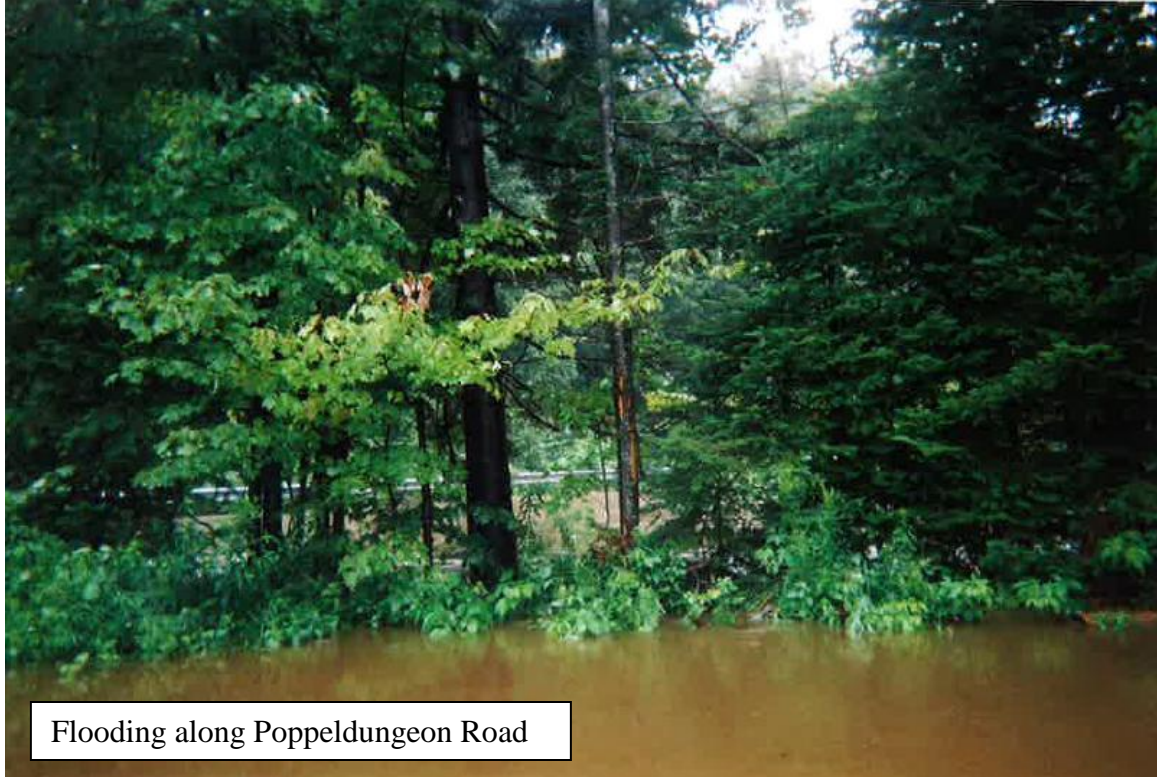


Plugged culvert on Christmas Tree Road





Flooding along Poppeldungeon Road

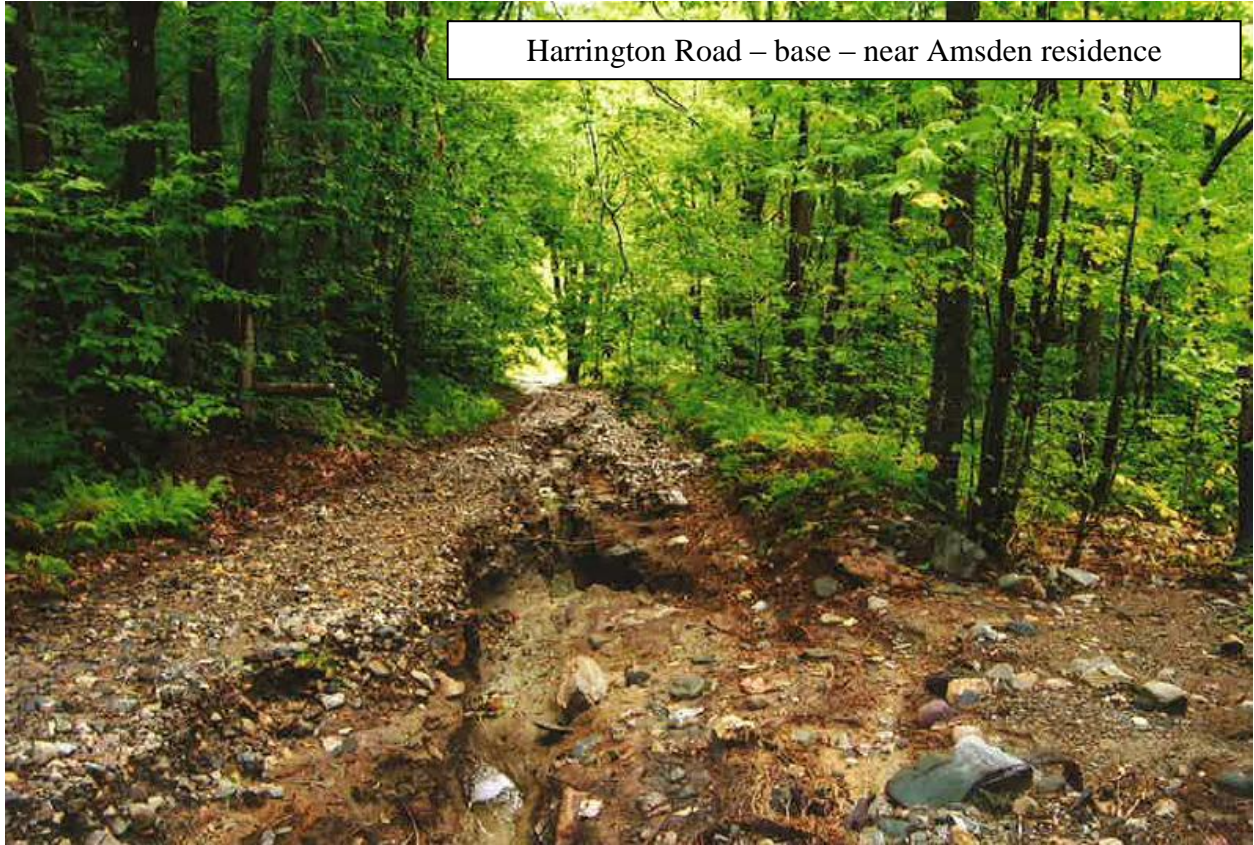


Flooding along Poppeldungeon Road

P. Photos of Damage in Windham during and after TS Irene (August 2011) – Photos provided by Heath and Mary Boyer







Harrington Road – base – near Amsden residence



Popple Dungeon Road at Christmas Tree Road



Christmas Tree Road



Horsenail Hill Road





Mercy Road culvert at Route 121

Q. Website posting of draft plan for public comment (posted 2/26/15-3/16/15)

The screenshot shows a web browser window with the address bar displaying "windhamvt.info". The page has a blue header with the text "This is not the official website of Windham, VT". Below the header, there is a navigation menu on the left under the heading "Administration" with the following items: Home, Town Office, Selectboard, School Board, Listers, Planning Commission, Conservation Commission, and About Windham. The main content area is titled "Windham Hazard Mitigation Plan" and contains the following text: "Prepared for the Town of Windham by the Windham Regional Commission THIS DRAFT IS OPEN FOR PUBLIC COMMENT THROUGH MARCH 16, 2015 – PLEASE SEND ANY COMMENTS TO ASABETTO at WINDHAMREGIONAL.ORG OR CALL 802-257-4547 X 109". Below this is the section "I. INTRODUCTION AND PURPOSE" which explains the plan's purpose and lists mitigation strategies such as flood-proofing structures, elevating furnaces, and ensuring adequate water supply. A link at the bottom of the page reads "To download the current draft in .PDF form click here".

## R. Email sent to Windham Hazard Mitigation Committee, soliciting comment on the draft plan

