Town of Calais, VT

Local Hazard Mitigation Plan

Date of Selectboard Adoption: September 27, 2021
Date of FEMA Final Approval: October 13, 2021

Prepared by the Town of Calais
with assistance from the Central Vermont Regional Planning Commission

Glossary/Acronym List

Base Flood: A flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood."

Base Flood Elevation (BFE): The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

Buffer: an undisturbed area consisting of trees, shrubs, ground cover plants, duff layer, and generally uneven ground surface that extends a specified distance horizontally across the surface of the land from the mean water level of an adjacent lake or from the top of the bank of an adjacent river or stream, as determined by the Secretary of Natural Resources.

Community Rating System (CRS): A program developed by FEMA to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

Declaration: Presidential finding that a jurisdiction of the United States may receive Federal aid as a result of damages from a major disaster or emergency.

Flood Insurance Rate Maps (FIRMS): The official map of a community prepared by FEMA, showing base flood elevations along with the special hazard areas and the risk premium zones applicable to the community.

Floodplain: Any land area susceptible to being inundated by floodwaters from any source.

Fluvial Erosion: streambed and streambank erosion associated with physical adjustment of stream channel depth and width

Inundation Flooding: the overflowing of rivers, streams, ponds and lakes due to excessive rain, rapid snow melt or ice.

National Flood Insurance Program (NFIP): a program managed by FEMA that makes federally-backed flood insurance available in those states and communities that agree to adopt and enforce flood-plain management ordinances to reduce future flood damage.

Pre-FIRM Building: A building for which construction or substantial improvement occurred on or before December 31, 1974 or before the effective date of an initial Flood Insurance Rate Map (FIRM).

Repetitive Loss Structure: 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

River corridor: the area of land surrounding a river that provides for the meandering, floodplain, and the riparian functions necessary to restore and maintain the naturally stable or least erosive form of a river thereby minimizing erosion hazards over time

Special Flood Hazard Area (SFHA): the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. This area is where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. This area is usually labeled Zone A, AO, AH, AE, or A1-30 on the maps published by FEMA

1. Introduction

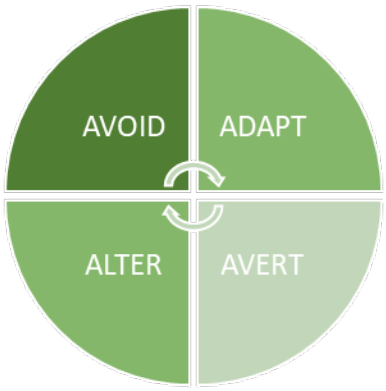
In accordance with the Stafford Act, municipalities may perform mitigation planning and be eligible to receive increased federal funding for hazard mitigation measures. (42 U.S.C. 5165).

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this Local Hazard Mitigation Plan is to provide an all-hazards local mitigation strategy that makes the community of Calais more disaster resistant.

Hazard mitigation is any sustained action that reduces or eliminates long-term 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 disasters than to repeatedly repair damage after a disaster has struck.

This Plan recognizes that communities 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 local actions that can be taken to reduce the severity of the hazard.

Hazard mitigation strategies and measures:



ALTER the hazard by eliminating or reducing the frequency of occurrence,

AVERT the hazard by redirecting the impact by means of a structure or land treatment,

ADAPT to the hazard by modifying structures or standards, or

AVOID the hazard by preventing or limiting development.

2. Purpose

The purpose of this Local Hazard Mitigation Plan is to assist the Town of Calais in recognizing hazards facing the region and is community and to identify strategies that begin reducing risks from acknowledged hazards.

The 2021 Calais Local Hazard Mitigation Plan is an update of the Town's adopted 2015 Local Hazard Mitigation plan, approved by FEMA on 07/22/15. This Local Hazard Mitigation Plan assists the Town to catalogue hazards facing the region and community, and to identify strategies that reduce risks from acknowledged hazards based on current information. The Town reviewed, evaluated, and revised the 2015 plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities. New information has been incorporated into the plan, making it up to date, stronger, and more useful to Town officials and residents who will implement the actions and measures going forward. Implementation of this plan will make Calais more resistant to harm and damages in the future, and will help to reduce public costs.

Calais strives to address the strategies, goals and objectives of the 2018 State Hazard Mitigation Plan, including an emphasis on proactive pre-disaster flood mitigation for public infrastructure, appropriate floodplain and river management practices, and fluvial erosion risk assessment initiatives.

The 2021 Calais Local Hazard Mitigation Plan is an update of the 2015 adopted plan. The plan consists of the modified, as described below, sections of the existing plan, which have been reorganized, and new sections:

- Information from the 2015 plan was updated.
- The Plan Update Process was updated.
- Plan Maintenance activities were updated.
- Hazards reflecting the community's priorities were updated.
- The Local Areas of Concern Map was updated to reflect new information.
- Status update of 2015 mitigation strategies was reviewed and documented.
- The new mitigation strategies section was updated and enhanced to reflect current priorities and intended actions of the community over the next five years.

The long term and overall goal of this plan is to protect life and property from harm/damages caused by natural and man-made disasters.

3. Community Profile

3.1 Geography

The Town of Calais is located in north-central Washington County, east of the Green Mountains and Worcester Range in the headwaters of the Winooski watershed. The town's landscape is largely defined by a blend of forested hills, meadows, small villages, farmland, lakes and ponds and streams. Relatively gentle terrain that has been conducive to the formation of agricultural soils (fine, sandy loam) can be found east of Route 14 and the Kingsbury Branch. Upland areas of the Town are generally characterized by step slopes and shallow, rocky soils. According to the 2016 Town Plan, Calais remains over 90% undeveloped and over 70% forested. Historically, Calais' population has largely been found in the villages and hamlets of North Calais, East Calais, Kent's Corner, Adamant, and Maple Corner. Calais is bounded by the towns of Marshfield to the east, East Montpelier to the south, Worcester to the west, and Woodbury to the north.

One of Calais' major features is its water bodies. Lakes, ponds and streams abound, including fifteen ponds of five or more acres. A 2017 Natural Resource Inventory found that Calais contains 620 individual wetland/potential wetland units; collectively these wetlands (including all lakes and ponds) encompass 10% of the Town land base. The largest ponds are Adamant Pond, Bliss Pond, Curtis Pond, Number 10 Pond, Nelson Pond, and North Montpelier Pond. The most significant stream is the Kingsbury Branch, which traverses the Town from north to south and is paralleled by Vermont Route 14. Other principal rivers are Pekin, Dugar, and Still Brook.

3.2 Development Patterns

According to the 2020 US Census, Calais has a total population of 1,661 people living in 842 housing units. Calais has seen its population increase 3.4% from the 2010 Census, while its number of occupied housing units has increased by 9.5%. Population projections devised by the Central Vermont Regional Planning Commission (CVRPC) assert that by 2020 the combined population in Calais and the adjacent Town of Woodbury will increase (17%) while the combined number of housing units will increase more dramatically (26%).

CVRPC's 2016 Regional Plan projected that 118 new housing units would be added in Calais from 2010 to 2020, an increase of 24%. However, according to the Vermont

Housing and Finance Agency, in 2018 there were 815 housing units, a decline of 3% from 2010.

Approximately 82.2% of Calais's workforce is employed outside of the community, while the remaining 17.8% are employed within the Town.

Development within the Town has historically been focused in the villages and hamlets situated in the lowland areas amidst Calais' streams and lakes. However, the 2015 Town Plan notes that "settlement patterns are now expanding into higher areas in the watershed, particularly along the upper County Road, Bayne Comolli Road, Jack Hill, Max Gray and Lightening Ridge Roads. With the exception of the four villages, residential development is scattered throughout the town, with growth extending linearly along all roads. Such growth may not be in the best interest of Calais' rural nature but is likely to continue if there are no incentives to alter the pattern (p14).

Scattered residential development in higher areas in the watershed may have implications for increased stormwater accumulation and erosion hazards. The Town is taking steps to prioritize roadside ditching and culvert/bridge replacement schedule with regard to existing conditions which have been determined to be inadequate to handle expected runoff and erosion in a flood event. The Calais Planning Commission is currently drafting three bylaw updates, to be voted on by Australian ballot in November 2021:

- New Erosion Control and Stormwater Management standard to require compliance with state guidelines for disturbance.
- Adoption of a River Corridor overlay that will prevent upland development from occurring in areas adjacent to upland streams and prone to erosion hazards.
- Shoreland Overlay District, to replace current district, that will mirror the State Shoreland Protection Act

The Town also collaborated with CVRPC staff to create a Stormwater Master Plan (SWMP) along the Kingsbury Branch in coordination with the towns of East Montpelier and Woodbury for flood mitigation to protect resources and infrastructure. Currently, Milone & Macbroom, Inc. are developing final designs for two sites identified as priority in the SWMP: East Calais Post Office, and Moscow Woods Road Gully. See **Attachments** for more information on the SWMP.

3.3 Utilities and Facilities

The Washington Electric Cooperative provides electricity to the majority of the town. Green Mountain Power serves the Route 14 corridor from East Montpelier to East Calais village, while the Hardwick Electric Department serves a narrow area on either side of Route 14 from the Woodbury town line to just north of East Calais village.

Natural springs, dug wells, and drilled wells provide water to most sections of town; however, East Calais Village is served by a public water system owned and operated by the East Calais Fire District #1. The Calais Elementary School is served by a Non-Transient, Non-Community Water System (NTNC); defined as a public water system that regularly serves at least 25 or more of the same persons daily. Wastewater treatment within the town is treated by individual subsurface disposal facilities.

Calais used to have a sewage ordinance administered locally. As of July 1, 2007, the Legislature created "universal jurisdiction" over wastewater and potable water supplies, closing the former "10-acre loophole" and requiring permits by the Vermont DEC Wastewater Management Division. Except where a municipality requests and is given delegation by DEC, municipalities may no longer adopt or administer local regulations on wastewater and potable water supplies. However, municipalities may prohibit construction under a zoning permit unless and until a wastewater and potable water supply permit is issued by the State. The innovative systems allowed under the new technical standards may allow historically "un-developable" land to be developed.

3.4 Public Safety

East Montpelier Volunteer Fire Department currently provides primary coverage for fire and ambulance to the Towns of East Montpelier and Calais with Woodbury Volunteer Fire Department providing additional coverage in Calais. The East Montpelier Volunteer Fire Department responded to 152 fire/rescue calls in Calais in 2019 (2020 data unavailable). In 2020, Woodbury Volunteer Fire Department responded to 30 fire/rescue calls in Calais.

Calais contracts with the Washington County Sherriff's Department to provide law enforcement services through a part-time deputy to enforce traffic. Calais also has a Town Constable. Full time law enforcement services are available through the Vermont State Police stationed at the Middlesex Barracks, although response time is limited by the driving distance of approximately 20 miles.

The Town of Calais has an approved Local Emergency Management Plan adopted in 2020, a 2019 Emergency Action Plan for the Curtis Pond dam, and a 2019 Curtis Pond dam hazard assessment report. The Calais Elementary School serves as the Town's primary emergency shelter and the Town Office is the Emergency Operations Center. The Town adopted Road and Bridge Standards in 2020 with the purpose of increasing the likelihood that town roads and bridges will withstand flooding and heavy rain events. These standards exceed those put forth by the Vermont Agency of Transportation.

3.5 Municipal Plan

The 2016 Town Plan includes a discussion and identifies goals regarding natural resources, land use, floodplain management, water quality protection, fire protection, and municipal services. The 2005 Land Use & Development Regulations, last amended in March 2017 and scheduled to be updated in 2021, include a Resource Recreation District, Shoreland District, Upland Overlay District, Flood Hazard Area Overlay District and standards regarding steep slopes and surface waters.

3.6 National Flood Insurance Program

For over 45 years, since 7/24/1975, Calais has participated in the National Flood Insurance Program (NFIP). In 2013, official Digital Flood Insurance Rate Maps became available. Using this data, there are 39 structures in the 100 year flood plain and 0 public facilities. There are no repetitive loss properties in Calais. There are 7 policies.

The Town of Calais currently has Digital Flood Insurance Rate Maps (DFIRM) available. These maps are available online through FEMA's Map Service Center (www.msc.fema.gov) or at the ANR Flood Ready Atlas (http://bit.ly/floodatlas). The current FIRMs are digitized versions of the original maps with adjustments to 20 feet contours. FEMA has recently authorized a map update process for the Winooski River Watershed. The Discovery phase will begin in the summer or fall of 2021. As part of this map update the community will receive computer model-based map updates incorporating both specific flood discharges and flood hazard delineation based on the equivalent of one-foot contours from LIDAR. This will be an ordinate improvement in the accuracy and precision of the FIRMs. If funding for the map update is maintained Calais may have new effective digital FIRMs around 2026. These maps will be "Zone A" maps based on specific flood events and delineated on topography with one-foot contour precision.

Calais' Flood Hazard Area Regulations apply to all areas in the Town designated as Special Flood Hazard Area (SFHA) on the DFIRM. Calais' Zoning Administrator serves as the Administrative Officer, and submits permits to ANR for review. The Administrative Officer maintains records of all permits issued for development in the SFHA, Elevation Certificates, and other required records.

3.7 Emergency Relief & Assistance Funding (ERAF)

Vermont's Emergency Relief & Assistance Fund (ERAF) provides State funding to match FEMA Public Assistance grants following a federally declared disaster. In 2014, the ERAF criteria were revised to incentivize communities to be more proactive prior to disasters. The default rate for State contribution towards non-federal Public Assistance match following a declared disaster dropped to 7.5%, requiring municipalities to cover the other 17.5% for Public Assistance projects. Municipalities that take four proactive measures are awarded 12.5% State match. The measures are:

- Participate in the National Flood Insurance Program (NFIP).
- Adopt Town Road and Bridge Standards that meet or exceed the VTrans template. Calais Road and Bridge Standards can be viewed on the VT Flood Ready website
- Adopt a Local Emergency Management Plan which is renewed and adopted annually.
- Adopt a Local Hazard Mitigation Plan approved by FEMA every five years.

Municipalities that wish to further decrease their cost share to 7.5%, with a 17.5% State match, must also meet one of the following criteria:

- Adopt River Corridor protections, or
- Enroll in the NFIP's Community Rating System CRS)[1], whereby the community must earn credit under Activity 430.2.

At the time this plan was developed, Calais had an ERAF rating of 7.5%. Calais has taken the following steps to reduce flood damage by:

- Participating in the National Flood Insurance Program,
- Adopting Town Road and Bridge Standards that meet or exceed the VTrans 2019 Template,

[1] The NFIP Community Rating System (CRS) was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum NFIP standards. Any community in full compliance with the minimum NFIP floodplain management requirements may apply to join the CRS.

[2] Activity 430 (Higher Regulatory Standards) is the primary CRS activity for crediting floodplain development regulations that are more restrictive than the NFIP requirements.

- Adopting a Local Emergency Management Plan which is renewed and adopted annually,

Current information on Calais is officially posted on the Calais Community Report at Flood Ready Vermont. The Town looks forward to the adoption and approval of this Local Hazard Mitigation Plan to reduce flood damage and increase the Town's ERAF to 17.5% through the adoption of river corridor bylaws.

4.Planning Process and Maintenance

4.1 Planning Process

The Central Vermont Regional Planning Commission (CVRPC) coordinated the Calais Local Hazard Mitigation Plan process. CVRPC's Executive Director, Bonnie Waninger, and Planner, Grace Vinson, met with members of the Calais Selectboard on January 27, 2020 to begin the process of updating the plan.

The COVID-19 pandemic interrupted meeting progress between March and October 2020 as Calais shifted to maintaining municipal operations and responding to the health and economic impacts of the situation. On October 10, 2020, Grace Vinson, Planner, facilitated an online kick off meeting to formally restart the update process, summarizing the hazard mitigation plan update process and project timeline.

At the November 11, 2020 meeting, the team discussed survey questions and a preliminary list of hazards affecting Calais. Grace Vinson distributed worksheets to allow each Planning Team member to rank hazards individually.

At the December 10, 2020 meeting, survey questions were confirmed, and hazards were prioritized based on individual scores. The Planning Team determined that Calais is most vulnerable to fluvial erosion/inundation flooding, invasive species, dam failure, pandemic, and drought. The Town will focus most of its mitigation activities on flooding as it is the most common and damaging hazard. Grace Vinson distributed requests for information to develop the Community Profile section.

At the January 21, 2021 meeting, survey distribution methods and the survey timeline were confirmed, and text updates and map updates were discussed. Grace Vinson provided the Planning Team with requests for information on the identified hazards to develop the vulnerability assessment.

CVRPC and the Planning Team developed a Calais-specific survey about hazards and emergency planning. This survey was available virtually through Survey Monkey, and

links were posted to the Town website, Front Porch Forum, and CVRPC's website and weekly news blast. Paper copies were also available at several important community locations: Maple Corner Store, Adamant Store, East Calais Post Office, and the Town Office. The survey opened on January 8, 2021 and closed on February 18, 2021. There were 37 respondents. A summary of survey results is included in the **Attachments.**

At the March 18, 2021 meeting, Grace Vinson provided a synopsis of the hazard mitigation survey results. Members discussed hazard profiles, contributed information to inform the plan, and discussed 2021 mitigation strategies.

At the April 14, 20201 meeting, 2021 mitigation goals and actions were discussed. The Planning Team walked through possible mitigation actions, prioritizing and assigning resources, leadership, and a time frame to each action.

Grace Vinson attended the April 26 Selectboard meeting to present the draft plan for comment and feedback.

See **Table 1** for a list of Planning Team members and meeting topics. All meetings were held virtually due to the COVID-19 pandemic.

Table 1: LHMP Planning Team Members

- Denise Wheeler, Selectboard Chair
- Nick Emlen, Emergency Management Director
- Jan Ohlsson, Planning Commission Chair
- Elizabeth Copeland, Emergency Management Team

LHMP Committee Meetings

Meeting 1: 10/10/20
- Refresher on scope and process, project timeline, and role of the planning team

Meeting 2: 11/11/20
- Public Engagement
- 2015 Project Status, Plans/documents to include, hazard identification and analysis

Meeting 3: 12/10/20
- Confirm public engagement
- Hazard assessment discussion

Meeting 4: 01/21/21
- Confirm survey distribution methods, text updates needed

Meeting 5: 03/18/21
- Text updates, mitigation strategies

Meeting 6: 04/14/21
- Maintenance process, mitigation strategies

Meeting 7: 04/26/21
- Update on draft LHMP for Selectboard

Meeting 8: 09/2/21

Review VEM comments and edits needed to finalize LHMP

Once the draft was updated, CVRPC placed a notice for public comments of the draft update on the CVRPC blog and newsletter. The draft update was available at the Calais Town Hall and by request from CVRPC for public review and comments from May 7th to May 21st, 2021. The announcement of the draft update in the CVRPC newsletter reached over 150 people and businesses in the Region's 23 towns, including the adjacent municipalities of East Montpelier, Worcester, Marshfield, and Woodbury. No comments were received. Public comments submitted, in the future, will be reviewed by the Selectboard (and CVRPC staff dependent on funding) and attached as an appendix. In the future, the draft plan will be made available during Town Meeting Day and local meetings with state and local officials to allow additional public comment and review.

At the September 2nd, 2021 meeting, the Planning Team discussed VEM comments and revisions needed to finalize the LHMP for Approval Pending Adoption (APA). On September 15, 2021, the plan was sent to VEM for final review and consideration of issuing an approval pending adoption. The plan was issued an Approval Pending Adoption from VEM on September 20, 201.The Town adopted the LHMP at their September 27, 2021 Selectboard meeting.

Table 2: List of individuals who were invited to comment on the plan

Organization	*Name, Position*	*Email*
Vermont Emergency Management (VEM)	Caroline Massa, State Hazard Mitigation Planner	Caroline.Massa@vermont.gov
Vermont Emergency Management (VEM)	Stephanie Smith, State Hazard Mitigation Officer	stephanie.a.smith@vermont.gov
Vermont Emergency Management	Ben Rose, Recovery and Mitigation Section Chief	ben.rose@vermont.gov
Vermont Emergency Management	Josh Cox, Critical Infrastructure Planner	josh.cox@vermont.gov
Central Vermont Regional Planning Commission	Grace Vinson, Planner	vinson@cvregion.com
Vermont Department of Environmental Conservation (DEC)	Ned Swanberg, Regional Floodplain Manager	ned.swanberg@vermont.gov
Vermont DEC	Gretchen Alexander, Regional Rivers Scientist	gretchen.alexander@vermont.gov
Vermont DEC	Eric Blatt, Division Director	Eric.Blatt@vermont.gov
Vermont DEC	Rob Evans, River Corridor and Floodplain Manager	rob.evan@vermont.gov

Table 2: List of individuals who were invited to comment on the plan		
Organization	*Name, Position*	*Email*
Vermont Department of Forests, Parks & Recreation (FPR)	Dan Singleton, County Forester	david.paganelli@vermont.gov
Vermont DEC	Benjamin Green, Dam Safety Engineer	Benjamin.Green@vermont.gov
East Montpelier Fire Department	Ty Rolland, Fire Chief	ty@blueridgeconstructionllc.com
Woodbury Volunteer Fire Department	Chance Payette, President Paul Cerutti, Chief	cwpayette@comcast.net, pcwoodbury@gmail.com
Town of Calais	Denise Wheeler, Selectboard Chair	calaissbdenise@gmail.com
Town of Calais	Janice Ohlsson, Planning Commission Chair	jgohlsson@gmail.com
Calais Elementary School	Cat Fair, Principal	cfair@u32.org
Union 32 Middle & High School	Steven Dillinger-Pate	sdpate@u32.org
Central Vermont Supervisory Union	Bryan Olkowski, Superintendent	bolkowski@u32.org
Green Mountain Power	Brenda Spafford	Brenda.Spafford@greenmountainpower.com
Washington Electric Cooperative, Inc.	Dan Weston, Director Engineering & Operations	dan.weston@wec.coop
Hardwick Electric		802-472-5201
Calais Constable	Wilson Hughes, First Constable	802-456-7442
Washington County Sheriff's Department	W. Samuel Hill	samuel.hill@vermont.gov
Vermont State Police, Middlesex Barracks	Lieutenant David White	david.white@vermont.gov
Local Emergency Planning Committee 5	Joe Aldsworth, Chair	chair.lepc5@gmail.com
Winooski Conservation District	Remy Crettol, District Manager	remy@winooskinrcd.org
Friends of the Winooski River	Michele Braun, Executive Director	michele@winooskiriver.org

Table 2: List of individuals who were invited to comment on the plan		
Organization	*Name, Position*	*Email*
White River Partnership	Mary Russ, Executive Director	mary@whiteriverpartnership.org

Table 3: List of surrounding communities who were invited to comment on the plan			
Municipality	*Person*	*Role*	*Email*
Town of East Montpelier	Rosie Laquerre	Town Clerk	clerk@eastmontpeliervt.org
Town of Worcester	Katie Winkeljohn	Town Clerk	worcestertclerk@comcast.net
Town of Marshfield	Bobbi Brimblecombe	Town Clerk	clerk@town.marshfield.vt.us
Town of Woodbury	Diana Peduzzi	Town Clerk	clerk@woodburyvt.org

4.2 Existing Mitigation, Maintenance and Preparedness Programs, Projects & Activities

The ongoing or recently completed programs, projects and activities are listed by mitigation strategy and were reviewed for the development of the plan. The Town Plan (2016), Town Report (2020), Land Use regulations (2017), Local Emergency Management Plan (2020), CVRPC Regional Plan (2018), and past newspaper articles were reviewed for pertinent information. Numerous documents and reports on Curtis Pond Dam, the Upper Winooski Corridor Plan (2008), Kingsbury Branch River Corridor Plan (2008), Kingsbury Branch Stormwater Master Plan (2019), Calais Ash Tree Management Plan (2019), and VT State Hazard Mitigation Plan (2018) were reviewed as well for information and future mitigation projects. Calais also adopted Road and Bridge Standards in 2019 with the purpose of increasing the likelihood that town roads and bridges will withstand flooding and heavy rain events. These standards exceed those put forth by the Vermont Agency of Transportation.

Table 4: Status of Existing Mitigation Programs, Projects, and Activities			
	Type of Existing Authority / Policy / Program / Action	*Resources: Staffing and Funding*	*Ability to Expand/ Improve upon*
Community Preparedness Activities	Program – Calais' Local Emergency Management Plan (LEMP) is updated annually after Town Meeting and submitted to VEM before the first of May. .	Calais Emergency Management Team	Ongoing - identifying and updating list of local resources and expertise that can be mobilized on short notice.
	Curtis Pond Emergency Action Plan (2004)	Selectboard	Updated June 2019

Table 4: Status of Existing Mitigation Programs, Projects, and Activities			
	Type of Existing Authority / Policy / Program / Action	*Resources: Staffing and Funding*	*Ability to Expand/ Improve upon*
Insurance Programs	Program – Calais will remain as a participant in the National Flood Insurance Program (NFIP).	Planning Commission	River Corridor Overlay will be added in next round of bylaw updates to expand our NFIP coverage. Expected to vote on this Nov 2021
Land Use Planning/ District and General Use Standards	Policy – Calais will maintain its municipal plan.	Selectboard	Updated 2016
	Program- Resource Recreation District (RR2): Limits construction in undeveloped lands that are necessary to protect ground water and aquifers, among other important resources. Requires a 50 foot buffer from wetlands, 50/20 foot buffer from streams, and a buffer of 50 feet from lakes and ponds.	Planning Commission	Proposed change for Nov 2021. Shoreland is 100 ft. buffer as per State. Lakes and ponds not covered by Shoreland- 50 ft. buffer All streams outside of River Corridor-35 ft. buffer. Wetlands to follow state VSWI 50 ft. buffer with exception of Class 1 wetland (300 ft. buffer). Any new development in a wetland buffer requires state approval
	Program- Shoreland District: Consists of all land within 800 feet of shoreland of all water surfaces of 20 acres or more. Requires a 50 foot buffer from wetlands, 50/20 foot buffer from streams, and a buffer of 50 feet from lakes and ponds.	Planning Commission	Shoreland District bylaw changes to be voted on Nov 2021; new Shoreland will mirror the State's Shoreland with the exception of extending to beyond the roads.
	Program- Upland Overlay District: Above 1,500 feet, all structures require a Conditional Use Permit except for those related to agriculture, forestry, home child care, home occupation, or small scale telecommunications. Minimum lot sizes are 25 acres.	Planning Commission	No change

Table 4: Status of Existing Mitigation Programs, Projects, and Activities			
	Type of Existing Authority / Policy / Program / Action	*Resources: Staffing and Funding*	*Ability to Expand/ Improve upon*
	Program- Flood Hazard Overlay District (FHO): Limits construction of structures in floodplain areas designated within the Flood Insurance Rate Map for Calais.	Planning Commission	Adding a River Corridor, no new construction will be allowed
	Program – Steep Slope Protection: • Development on slopes in excess of 15% are subject to conditional use review by the DRB. • Timber Management & Wildlife District • Between 1,500 feet and 2,500 feet only low impact, nonstructural development is a Permitted Use and minimum lot sizes are 25 acres. Low impact structures are a Conditional Use.	Planning Commission	May update to align with State standard requiring DRB review for shoreland development > 20% will decide after public hearing.
	Program – Surface Water Protection: Requires a 50 foot buffer from wetlands, 50/20 foot buffer from streams, and a buffer of 50 feet from lakes and ponds.	Planning Commission	Changing to add storm water management/erosion clause to all standards: Any disturbance <1 acre must also follow state guidelines for disturbance of 1 acre of land
Hazard Control and Protection of Critical Infrastructure & Facilities	Program: Maintenance Programs (Culvert Survey & Replacement)	CVPRC	Info on culvert condition is available through VTrans; periodic culvert surveys completed by CVRPC
	Program: Road Erosion Assessment (2012)	CVRPC/ Planning Commission	North Branch & Kingsbury Branch Class 3 and Class 4 Road Erosion Assessment completed, Road Erosion Inventory conducted in 2019

Table 4: Status of Existing Mitigation Programs, Projects, and Activities			
	Type of Existing Authority / Policy / Program / Action	*Resources: Staffing and Funding*	*Ability to Expand/ Improve upon*
	Program: Adopted Road and Bridge Standards (2014)	Road Commissioner, Calais Roads Advisory Committee, Selectboard	Annual Review
	Program: Established Roads Advisory Committee (2013)	Selectboard	Trying to revitalize in 2021
	Program: Maintain Capital Mutual Aid System.	EMFD, WVFD	Ongoing
Protection/ Retrofit of Infrastructure and Critical Facilities	Dry Fire Hydrants-4	EMFD	List available from EMFD
	Back-up generators at the Town's emergency shelter and Emergency Operations Center (2004)	Selectboard	Generator at Town office and Calais Elementary School, plan on purchasing generator for Town Hall
Education/ Public Outreach	Program: Fire Prevention Week	CES, EMFD, WVFD	Ongoing

4.3 Plan Maintenance

The Calais Selectboard with assistance from the Planning Commission or EMD, will conduct monitoring with support of CVRPC as funding allows. CVRPC will create and send a template to track implementation of 2021 mitigation actions over time. CVRPC will send an annual reminder of monitoring and the Selectboard with assistance from the Planning Commission or EMD will meet annually to complete this template. The Selectboard with assistance from the Planning Commission or EMD will create a document of "findings" as a result of monitoring so that changes to make in the next LHMP are clearly outlined. This can be a living document that is updated after the annual meeting. The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice in the municipal building, Front Porch Forum, and CVRPC newsletter and blog inviting the public to the scheduled meeting. Additional stakeholders invited to the meeting will be Town residents, and representatives from the Planning Commission. Also invited in the future will be the VT Agency of Natural Resources (VT ANR), as it is able to provide assistance with NFIP outreach activities, models for stricter floodplain zoning regulations, delineation of river corridor areas, and other applicable initiatives. These

efforts will be coordinated by the Selectboard with assistance from the Planning Commission or EMD, with assistance from CVRPC as funding is available.

As stated above, the Calais LHMP will be updated and evaluated annually. Updates and evaluation will also occur within three months after every federal disaster declaration and as updates to town plan/zoning and river corridor plans come into effect. CVRPC will help with updates or if no funding is available, the Selectboard with assistance from the Planning Commission or EMD will update the plan.

The LHMP Planning Team is also interested in enhancing the LHMP evaluation process by developing a template to track specific metrics. This template is intended to be revised as needed to add additional metrics. See **Attachments** for a draft template. This template will be discussed at the annual meeting discussed above.

Calais shall also incorporate mitigation planning into its long term land use and development planning documents. It is recommended the Town review and incorporate elements of the Local Hazard Mitigation Plan when updating the municipal plan, zoning regulations, and flood hazard bylaws. The incorporation of the Local Hazard Mitigation Plan into the municipal plan, zoning regulations and flood hazard bylaws will also be considered after declared or local disasters. The Town shall also consider reviewing future Upper Winooski Corridor planning documents and Tactical Basin Plans for ideas on future mitigation projects and hazard areas and opportunities to pursue multiple community priorities, co-benefits, and funding for hazard mitigation The 2018 Winooski Tactical Basin Plan is scheduled to be updated by 2023.

This LHMP will be updated every 5 years, or on a 5-year cycle. In subsequent plan update processes, the draft plan will be made available during Town Meeting Day and local meetings with State and local officials to allow for more public comment and review. Public comments submitted will be reviewed by the Town Clerk (and CVRPC staff dependent on funding) and attached as an appendix. After Approval Pending Adoption, the plan will go before the Selectboard for adoption.

4.4 Status of Prior Plan's Mitigation Actions

Table 5: Mitigation Actions from the 2015 LHMP and 2021 Completed and in progress actions

Mitigation Action	*2021 Status*
Upgrade and replace culverts identified in 2015 Plan attachments	Replace culverts annually as identified by CVRPC culvert inventory
Replace Pekin Branch Bridge; Max Gray Road	Pekin Bridge not done, some work done on Max Gray Road

Table 5: Mitigation Actions from the 2015 LHMP and 2021 Completed and in progress actions	
Mitigation Action	*2021 Status*
Implement Fluvial Erosion Hazard/River Corridor regulations	To be voted on November 2021
Treat select Road Erosion Sites identified in 2015 Plan attachments	Updated road erosion inventory conducted in 2018
Flood-proof historic Town Hall structure	Town Hall was moved out of flood zone
Review options with regard to FEMA's Community Rating System	Not completed
Review Zoning Regulation language with regard to septic and water systems in flood areas	Septic regulations done through DEC
Reestablish an effective Emergency Action Plan (EAP) for Curtis Pond Dam	Have asked Curtis Pond Dam monitors to review and update plan; also consider EAP for Adamant Dam
Revisit Curtis Pond Dam replacement process: i) get up-to-date cost estimates, ii) set up a replacement schedule/timeline, iii) establish dam replacement fund	Town does not own this dam.
Establish beaver dam reporting and monitoring mechanism to track large impoundments of water which have recognized destructive potential	Maple Corner Residents set up schedule to monitor and remove debris (not official Town appointed group); Curtis Pond Dam Owners Association to update Selectboard in near future
Evaluate drainage pattern in the hillside to prevent future saturation	Not completed, move to 2021 list
Provide training to residents on how to insulate homes (pipes, attics) for extreme cold spells	Group doing free home energy inspections and Calais Energy Committee (not Town Committee)
Upgrade electrical systems in municipal buildings and shelters to prevent surge/equipment damage from fluctuating current during ice and wind storms	Surge protectors installed at Town Office, Calais Elementary School, and newly renovated Town Hall
Work with elected officials, the State and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through continuous communications, training and education	Ongoing
Inventory and document all known 37 existing structures that are within the Flood Hazard Overlay District	Ongoing, keep in 2021 list

5. Community Vulnerability by Hazard

5.1 Hazard Identification

The following natural disasters were discussed and the worst threat hazards were identified based upon the likelihood of the event and the community's vulnerability to the event. Hazards not identified as a "worst threat" may still occur in Calais. Greater explanations and mitigation strategies of moderate threat hazards can be found in the State of Vermont's Hazard Mitigation Plan.

Hazard impacts were rated on their probability and potential impact to infrastructure, life, economy, and environment. The impact was then averaged, and multiplied by the probability to develop a score to compare hazard impacts in Calais. For information regarding the ranking criteria, please refer to **Table 6.**

Table 6: Hazard Assessment Ranking Criteria

	Frequency of Occurrence: Probability of a plausibly significant event	**Potential Impact:** Severity and extent of damage and disruption to population, property, environment, and the economy.
1	**Unlikely**: <1% probability of occurrence per year	**Negligible**: Isolated occurrences of minor property and environmental damage, potential for minor injuries, no to minimal economic disruption
2	**Occasionally**: 1-10% probability of occurrence per year, or at least one change in the next 100 years	**Minor**: Isolated occurrences of moderate to severe property and environmental damage, potential for injuries, minor economic disruption
3	**Likely**: >10% but <75% probability per year, at least 1 chance in next 10 years	**Moderate**: severe property and environmental damage on a community scale, injuries or fatalities, short-term economic impact
4	**Highly Likely**: >75% probability in a year	**Major**: severe property and environmental damage on a community or regional scale, multiple injuries or fatalities, significant economic impact

Table 7: 2021 Calais Hazard Table							
Hazard Impact	**Probability**	**Potential Impact**					**Score ***
		Infrastructure	Life	Economy	Environment	Avg.	
Fluvial Erosion	4	4	2.0	3.3	3.3	3.2	**12.7**
Inundation Flooding	4	3.7	2.3	3.0	2.7	2.9	**11.7**
Pandemic	4	2	4	4	1	2.8	**11.3**
Drought	4	2	3	3	4	2.8	**11.3**
Invasive Species	4	3	2	3	4	2.75	**11.0**
Snow	4	3	3	2	2	2.4	**9.7**
Dam Failure	3	3	3	3	2	2.75	**8.3**
Wind	4	3	2	2	2	2.1	**8.3**
Cold	4	3	2	2	1	2	**8**
Ice	4	2	2	2	2	1.8	**7.3**
Heat	3	2	2	2	3	2.25	**6.8**
Wildfire	3	2	2	2	2	2.1	**6.3**
Hail	3	2	1	2	1	1.4	**4.3**
Landslides	2	2	2	2	2	1.75	**3.5**
Earthquake	1	2	2	2	1	1.8	**1.8**

*Score = Probability x Average Potential Impact

The Town of Calais identified the following hazards as presenting the worst threat to the community:

- Fluvial Erosion & Inundation Flooding
- Invasive Species
- Pandemic
- Drought
- Dam Failure

The Town is interested in focusing a majority of mitigation efforts into reducing impacts from flooding, as the events occur most frequently, severely and cause the most damage to public and private infrastructure.

Other hazards not identified as worst threat may still occur in Calais, but the Town decided to prioritize the above hazards as they pose a consistent, historical threat with a

large impact to most Calais residents. The Town recognizes that the hazards of wildfire, heat, earthquake, landslide, and hail may pose a threat to Calais residents, but due to a lack of consistent historical occurrences and lower potential impact, these hazard impacts have been excluded from this plan. A review of the Vermont State Hazard Mitigation Plan of November 2018 provides a greater explanation of these hazards and possible mitigation strategies to address them.

Like the State of Vermont Hazard Mitigation Plan, Calais did not include the following hazards in the risk and vulnerability assessment due to the low occurrence, low vulnerability, and or geographic proximity: civil disturbance, coastal erosion, expansive soils, karst topography, sinkholes, tsunami, and volcano.

The 2021 update to the 2015 LHMP added several new hazards: pandemic/infectious disease outbreak, drought, and invasive species. Water Supply Contamination, Landslide, and Extreme Cold/Winter Storm/Ice Storm have been removed from the list of priority hazards due to low probability, and shifting priorities.

A discussion of each worst and moderate hazard is included in the proceeding subsections and a map identifying the location of each hazard is attached (See map titled **Areas of Local Concern**.) Each subsection includes a list of past occurrences based upon County-wide FEMA Disaster Declarations (DR-#) plus information from local records, a narrative description of the hazard and a hazard matrix containing the following overview information:

As stated in the State Hazard Mitigation Plan, this LHMP recognizes that "climate change is likely to increase the frequency and severity of a number of Vermont's hazards." The natural hazards addressed in the plan are likely to be exacerbated by changes in climate, either indirectly or directly. The hazard profiles include discussion of how climate change could indirectly or directly impact hazards.

Additionally, the 2016 Calais Town Plan states, *"The Town of Calais and its residents are affected by climate change in diverse ways. Rain deluges, snow storms, and winds affect our roads and waterways. Intense cold snaps increase heating costs in the winter. Floods and damage from storm runoff affect our Town budget. The Flood Resilience section of this plan highlights some of the costly damages the Town would incur in the events of flooding. While the costs of mitigation and the costs of changing to alternative resource use may be high, the costs of repairing damages are higher."*

Hazard	*Location*	*Vulnerability*	*Extent*	*Impact*	*Likelihood*
Type of hazard	General areas within municipality which are vulnerable to the identified hazard.	Types of structures impacted	Minimal: Limited and scattered property damage; no damage to public infrastructure contained geographic area (i.e., 1 or 2 communities); essential services (utilities, hospitals, schools, etc.) not interrupted; no injuries or fatalities. Moderate: Scattered major property damage (more than 50% destroyed); some minor infrastructure damage; wider geographic area (several communities) essential services briefly interrupted; some injuries and/or fatalities. Severe: Consistent major property damage; major damage to public infrastructure (up to several days for repairs);	Dollar value or percentage of damages (if known).	Highly Likely: >75% probability in a year. Likely: >10% but <75% probability per year, at least 1 chance in the next 10 years. Occasionally: 1-10% probability of occurrence per year, or at least one chance in the next 100 years. Unlikely: <1% probability of occurrence per year

Hazard	*Location*	*Vulnerability*	*Extent*	*Impact*	*Likelihood*
			essential services interrupted from several hours to several days; many injuries and fatalities.		

6. Threat Hazards

6.1 Fluvial Erosion and Inundation Flooding

Fluvial Erosion and inundation flooding are common occurrences in Calais.

Fluvial erosion is a "streambed and streambank erosion associated with physical adjustment of stream channel depth and width" (2018 SHMP). This erosion process may occur more quickly and severely during flood events. Where buildings are placed too close to streams, and the channel becomes straightened and armored, the stream flow becomes faster and more powerful, often directing subsequent damage to nearby roads, culverts and property. Most flood-related damage in Vermont is due to fluvial erosion. The 2018 SHMP states "*The more trapped the river is, the greater power it will gain, which eventually results in a greater degree of damage to critical public infrastructure…homes, businesses, community buildings and other man-made structures built near rivers."*

Inundation Flooding is the overflowing of rivers, streams, ponds and lakes due to excessive rain, rapid snow melt or ice. Water flows out of the river bank, and spreads across the floodplain.

The 2018 SHMP projects annual precipitation and seasonal precipitation to increase due to climate change and states "*Vermont's historic settlement pattern, in association with the widespread channelization of rivers and loss of functioning floodplains due to encroachments and fill, make Vermont particularly vulnerable to climate change-related increases in flood frequency and magnitude*". The SHMP also notes heavier rainfall events are likely to become more frequent and intense, and flood events are more likely, particularly in winter. The SHMP also notes that Annual precipitation is projected to increase 10% (about 4" a year) by the end of the century.

Recent History of Occurrences (presidential declarations and NCDC query search information within Central Vermont – Town-specific data not available.

Table 8: Fluvial Erosion and Inundation Flooding Historical Events			
Date	*Event*	*Location*	*Extent*
10/31/2019	Flood	County-wide,	DR 4474
4/17/2019	Flood/Severe Storms	County Wide	DR 4445
4/15/2014-4/19/2014	Flood/Severe Storms	County Wide	DR 4178
6/25/2013	Flood/Severe Storms	County Wide	DR 4140
11/08/2011	Flood/Severe Storms	County Wide	DR 4043
8/28/2011	Flash Flood (TS Irene)	County Wide	Winooski River crested at 19.05 feet in Montpelier– flood stage is at 15 feet; 5-7" of rain - DR 4022
5/26/2011	Flash Flood	County Wide	4" of rain; Montpelier gauge at 17.59 feet – DR 4001
4/23- 5/9/2011	Flash Flood	County Wide	DR 1995
5/9/2010	Flood-beaver dam	Calais	Beaver dam across the southern narrows of Adamant Pond let go; millions of gallons of previously impounded water swept over a manmade stone dam, overwhelmed a large culvert, and jumped the road. Center Road and several nearby buildings were damaged. Seven homes were evacuated.
8/2/2008	Flash Flood	County Wide	Not a historical crest; data gap
7/11/2007	Flash Flood	Northeast Washington County	3-6" of rain in 2 hours – DR 1715, not a historical crest
6/26/2006	Flood	County Wide	3-4" of rain, not a historical crest
9/16/1999	Tropical Storm Floyd	County Wide	Montpelier flood gauge at 9.30 feet, 5-7" rain county wide - DR 1307
6/27/1998	Flash Flood	County Wide	3-6" of rain over 2 day period – DR 1228, not a historical crest
6/6-6/8/1984	Flood/Severe Storms	Calais, County Wide	Town Hall flooded, 5" of rain, debris in culvert caused Pekin Brook to jump Kent Hill Road and take out length of North Calais Rd. – DR 712

Table 8: Fluvial Erosion and Inundation Flooding Historical Events			
Date	*Event*	*Location*	*Extent*
8/5/1976	Flood	County Wide	Montpelier flood gauge at 12.31 feet – DR 518
6/30/1973	Flood	County Wide	Montpelier gauge at 17.55 feet - DR 397
9/22/1938	Flood/Hurricane	County Wide	Montpelier flood gauge at 14.11 feet
11/03/1927	Flood	County Wide	Montpelier flood gauge at 27.10 feet

"Flooding is the most serious potential natural disaster that Calais has to plan for."

2016 Calais Town Plan

Given Calais' traditional settlement patterns with homes situated nearest to bodies of water, and the sheer number of lakes, ponds and streams, Calais is quite susceptible to flooding. Calais joined the National Flood Insurance Program (NFIP) in 1975 and the Town's NFIP-designated 100-year floodplain is located throughout the town, but out of reach of most of the Town's built environment. However, based on the results of overlaying the FIRM flood maps with the location of the E911 points, there exist 39 buildings in the Town which are vulnerable to potential flooding (within the high-risk "Zone A" Special Flood Hazard Area). This estimate may have a margin of error as the e911 points do not identify the point on the building closest to the flood source. A similar overlay exercise with the Fluvial Erosion Hazard Areas shows that 6 residential buildings are vulnerable to fluvial erosion hazards.

Flooding also occurs outside of the SFHA, where high discharges may cause overland flooding from localized stormwater and flows associated with small streams and wetlands The Town is developing a River Corridor overlay and Fluvial Erosion Hazard Area regulations to maximize channel stability and minimize fluvial erosion hazards by protecting the room needed by stream and river channels to maintain their least erosive gradient down the valley (such as along Kingsbury Branch and Pekin Brook) through preventing future development in these areas. The 2019 Kingsbury Branch Stormwater Master Plan, which identifies potential best management practices to mitigate stormwater runoff from Pekin Brook and Kingsbury Branch, notes that Pekin Brook "has several major stressors including lack of riparian buffer, encroachments by roads, straightening of the channel, and undersized structures". Additionally, the Plan notes that development on the Route 14 corridor "has constrained [the Kingsbury Branch] along both banks in certain areas…" In addition to expanding development along this corridor, Calais experiences erosion as a result of steep slopes and unstable soils.

Unmanaged stormwater runoff and erosion on steep slopes can contribute to fluvial erosion and inundation flooding. Additionally, many roads in Calais have steep slopes, predisposing areas to erosion.

The estimated loss for a severe flooding event for all properties located within the town's 100-year floodplain is approximately $76,690,500. This flood loss potential represents 45.41% of the total value of properties within Calais. Currently there are 7 flood insurance policies in Calais covering $2,010,400 in property value; two of these are identified as being in a flood hazard area (Zone A). As such, 95% percent of the structures at risk are not carrying flood insurance. There are no repetitive loss properties located in Calais.

Severe flooding events include a summer storm in 1984 (see text box below and see **Figure 1)** as well as flooding in 2010, when a beaver dam in Adamant Pond released, sending millions of gallons of water over a large culvert and jumping the road. Center Road and several nearby buildings were damaged; seven homes were evacuated.

"On June 6, 1984, a sudden summer storm dropped 5 inches of rain on already saturated ground, sending swollen streams over their banks. In Gospel Hollow, a culvert choked with vegetative debris caused the fast moving waters of Pekin Brook to jump Kent Hill Road and take out a length of the North Calais Road. The flash flood scoured a six-foot deep by thirty-foot-wide channel through the gravel and exposed the logs of the ancient corduroy road upon which the new road had been built. The Town Hall was an island, surrounded by water over thirty-six inches higher than the lower floor level."

2016 Calais Town Plan

Figure 1: Flooding of June 6-7, 1984. Source: Town of Calais

As previous events have made clear, even areas beyond the NFIP designated 100-year floodplain may be vulnerable to flood related hazards. Channel adjustments with devastating consequences have frequently been documented wherein such adjustments are linked to historical channel management activities, floodplain encroachments, adjacent land use practices and/or changes in watershed hydrology associated with conversion of land cover and drainage activities, within and beyond the NFIP floodplain.

The attached Hazard Analysis Map identifies the Town Offices, an identified Emergency Operations Center, as well as other buildings, to be outside the designated floodplain, but near major waterways.

In 2019, the Kingsbury Branch Stormwater Master Plan (SWMP) was completed, presenting Best Management Practices (BMPs) that would address stormwater concerns for Calais, Woodbury, and East Montpelier. The SWMP identifies 20 high ranking sites for which BMPs would provide the greatest water quality benefit, and 5 high priority sites. These sites are: Moscow Woods Gully, East Calais Post Office, Marshfield Road, Calais Elementary School, and the Town Garage. 30% engineering designs were

completed for each of the Top 5 Sites. CVRPC is currently working with the Town of Calais to develop final design for two of these sites: Moscow Woods Gully and East Calais Post Office. Following completion of final design, the Town is interested in pursuing additional grant funding for construction of these stormwater practices. Treating stormwater runoff as close to the source as possible will mitigate flooding and maintain health of Calais' waterways. See **Attachments** for a full description of the top 5 ranking sites.

Bridges and roads are particularly susceptible to damage in the event of a flood related event. The **Areas of Local Concern Map (attached)** identifies Kent Hill Road at Kent's Corners as prone to flooding. The vulnerability of this particular road is important as it serves as a primary access between Maple Corner and Vermont Route 14 and provides access to Calais' Emergency Operations Center (Town Offices).

Additionally, two culverts on Kent Hill Road are susceptible to clogging and creating backup during flood events that allows water to flow over the top of Kent Hill Road. The Town has previously discussed replacing or upsizing the culvert at Kent Hill Road (crossing Pekin Brook) as a high priority. As detailed in **Table 8,** the Pekin Brook culvert has clogged during previous floods, exacerbating flooding on Kent Hill Road.

The 2008 Kingsbury Branch River Corridor Plan notes that the Pekin Brook culvert is "mostly incompatible for geomorphic compatibility". In September 2016, Milone & MacBroom developed the Pekin Brook Floodplain Mapping & Calais Town Hall Alternatives Analysis to guide alternatives for restoration of the Town Hall and surrounding area (including two culverts on Pekin Brook) that would reduce damage frequency and increase public safety. Regarding the Pekin Brook culvert, the Analysis notes:

- *"the culvert is susceptible to clogging during floods",*
- *"both culverts under Kent Hill Road were found to be mostly incompatible with current channel form and process having a moderate to high risk of structure failure"*
- *"the culverts are fundamentally undersized relative to the stream channel"*
- *"modeling estimates that overtopping occurs during the 50 year and larger floods, assuming clear flow conditions (no clogging of the culverts). If the Pekin Brook culvert was clogged, flooding would occur at the east and south sides of the Calais Town Hall, similar to what occurred during the 1984 flood.*

The preferred alternative identified in the Analysis is to increase the size of the Pekin Brook culvert to the channel bank full width of 22 feet, to swap the existing Pekin Brook culvert to Elmslie Brook and to elevate the Town Hall approximately 2 feet over the

proposed base flood elevation. See more information about the preferred alternative in **Attachments**. In 2019, the foundation of the Town Hall was raised 2 feet in 2019, partially mitigating the risk of future flooding. Pekin Brook adjacent to the Town Hall was stabilized by planting 120 stems for a 50-foot buffer. The Town remains concerned that a future flood, specifically a 50-year or larger flood, could lead to roadway wash out or impact the Town Hall. Replacement of this culvert is identified as a high priority mitigation action in **Table 16**.

Figure 2: Old West Church. Source: 2016 Calais Town Plan

Additionally, Kents Corner is the site of multiple properties included on the National Register of Historic Places including:

- Kents Corner State Historic Site: settled in the late 1780s, encompasses a well-preserved 19th-century crossroads hamlet, providing a rare glimpse of a relatively untouched rural Vermont community.
- Robinson Sawmill.
- Old West Church.

The Kents Corner-Old West Church Historic District includes these three community assets, extending a quarter mile in each direction along Kent Hill and Old West Church Roads. Portions of the Historic District lie within the flood hazard area. Flooding impacting these historic sites would have a detrimental impact on the character and culture of the Town, as these sites are rare examples of untouched, undeveloped rural sites.

Figure 3: Kent Tavern. Source: 2016 Calais Town Plan

The Calais 2016 Town Plan notes "*The East Calais Church, the East Calais General Store and the repurposed East Calais School are historically significant, as are the Adamant Cooperative Store, the Adamant Church, the Adamant Community Center, Memorial Hall in North Calais, and all the ancient barns, too numerous to name*."

Pekin Brook Bridge (TH16) has experienced moderate flooding in recent events and is reported as significantly undersized with alignment issues in the Pekin Brook Corridor Plan. VTrans is currently in the process of replacing the bridge. Construction is scheduled to begin in 2021.

In 2017, CVRPC conducted a Road Erosion Inventory to identify locations that result in problematic road erosion - the sites with the most significant hydrological impact due to erosion. The inventory found that out of the 652 hydrologically connected road segments in Calais, 56% do not fully meet the standards of the Municipal Roads General Permit (MRGP). Twenty-six segments were identified as Very High Priority - segments on slopes greater than 10% that do not meet standards. See **Attachments** for a full list of very high priority segments. Implementation plans to bring segments to MRGP compliance standards will include measures like grass and stone-lined drainage ditches, stone check-dams, sheet flow infiltration, ditches and turnouts disconnected from surface waters, road crowning, upgrading culverts, installing outlet stabilization headwalls, and stabilizing exposed soil.

Decreases in Vulnerability

The new river corridor bylaws, scheduled to be voted on in November 2021, will reduce vulnerability to fluvial erosion and inundation flooding; the proposed regulations prohibit new structures in the flood hazard overlay and river corridor overlay. Substantial improvements would go to current use review by the Calais Development Review Board (DRB).

As noted earlier in this section, the foundation of the Town Hall was raised 2 feet in 2019 to mitigate the risk of future flooding. Additionally, in 2018 the Armstrong Farm easement protected 12,000 feet along Pekin Brook corridor and tributaries, planting 1,800 trees/shrubs to support 50-foot buffer.

Table 9: Fluvial Erosion and Inundation Flooding Hazard Risk Assessment

Hazard	*Location*	*Vulnerability*	*Extent*	*Impact*	*Probability*
Fluvial Erosion/ Inundation Flooding	Along Pekin Brook and Kingsbury Branch; Pekin Branch Bridge, select roads and culverts Kent Hill Rd, Dugar Brook Rd. North Calais Rd and Gar Rd, and along Route 14	Culverts, bridges, 15-20 dwellings are in River Corridor [erosion hazard] Adamant Coop is in river corridor and Maple Corner Store is in a Flood Hazard zone Town Hall	1984 flood: 5" of rain; flooding 3' above lowest floor of Town Hall; 30 feet of North Calais Rd washed out in flash flooding due to vegetative debris in culvert	Replacements of small culverts in critical, closed or urgent condition could range from $1,200-$1,500 each Substantial improvements to any dwellings and stores upwards of $50k - $100k each	Highly likely, may become more frequent due to climate change

6.2 Invasive Species

Invasive species are plants, animals, and other organisms that are introduced to a non-native ecosystem and also cause harm to the environment, economy, or human health. They are primarily spread by human activities that are introduced intentionally for reasons like agriculture, medicine, sport, decoration, land stability, and biological control.

Emerald Ash Borer

As of January 2021, emerald ash borer (EAB), a destructive forest insect from Asia, had been confirmed in 13 Vermont towns: Orange, Plainfield, Barre, Groton, Montpelier, East Montpelier, Stamford, South Hero, Bristol, Bennington, Peacham, Cabot, and Woodbury.

Figure 4:Emerald Ash Borer Agrilus planipennis. Photo Credit: VT Urban & Community Forestry.

EAB overwinters as larvae under the bark of ash trees where it feeds on the inner bark tissue. Once infested, ash trees rapidly decline and die in 1-5 years, if not treated, and may become a hazard to public safety. EAB is known to be established in 34 states and four Canadian provinces. It is responsible for widespread decline and mortality of hundreds of millions of ash trees in North America. Three species of ash trees - Green Ash (Fraxinus pennsylvanica), Black Ash (Fraxinus nigra), and White Ash (Fraxinus americana) – are found in Vermont.

Figure 5: EAB movement under the bark of an ash tree. Photo Credit: VT Urban & Community Forestry

Ash trees comprise approximately 5% of Vermont forests. They also are a very common and important urban tree. EAB threatens all three species of Vermont's ash trees. It could have significant ecological and economic impacts. There are no proven means to control EAB in forested areas, though individual trees can sometimes be effectively treated. An inventory will facilitate realistic management of EAB by prioritizing removals, identifying trees suitable for treatment, and budgeting for tree treatment or removal. Upon completion of an inventory, municipalities are urged to transition this collected data into an Ash Tree Management Plan where they identify the

most appropriate approach to take including removing the tree, having it treated, or allowing it to succumb to EAB and fall on its own.

Vermont municipalities should understand their public ash tree population, including ash trees:

- In the right-of-way in town centers (street trees) and in high-use areas
- In parks, town greens, or other town-owned recreational areas
- In the right-of-way on rural roads
- In natural areas, i.e. town forests, that could impact public safety if diseased or dying, such as those along trails
- On private land that impact town properties or the town right-of-way, or are a priority for preservation

As shown in **Figure 6**, (red represents confirmed infested areas and yellow represents high risk areas), the Town of Calais is not in the confirmed infested area. Most of Calais, however, is in the high-risk area for EAB infestation, defined as between 5 and 10 miles in radius from a confirmed EAB infested site.

Adult EAB are estimated to travel between 1 and 2 miles per year on their own but are moved around the landscape much faster by the transportation of infested wood. Due to the proximity of Calais to a known infestation, the 2019 Calais EAB Draft Management Plan estimated that ash trees in Calais will be infested within the next few years. Neal Maker, Licensed Forester and member of the Calais Conservation Commission, notes that it typically takes a minimum of 3 years after detection for ash trees to start dying. Mortality rates in the Midwest, where EAB was first detected, was 95% after 15 years, with peak mortality between years 11 and 16. Maker therefore believes "it's entirely possible that trees will be dying and falling" over the next 5 years, and will almost certainly be dying 10 years from now. In the 2019 and 2020 Calais Town Reports, the Calais Conservation Commission stated the arrival of EAB is inevitable and is expected to destroy "most if not all" of the town's ash trees. Additionally, as stated in the text box below, climate change may exacerbate impacts such as increased stress on native species and changes in climate more suitable for southern or invasive species.

> *Increases in average annual temperatures will force [invasive] species to adapt. Potential impacts on forests include increased stress on native tree species, shifts in forest composition due to a climate more suitable for southern species, and the potential for isolated species having a reduced ability to migrate and respond to climate change[1]. Of particular concern are the Asian longhorned beetle (not yet detected in Vermont), emerald ash borer and hemlock wolly adelgid, which have killed millions of trees across the U.S. and Canada.*
>
> --2018 State Hazard Mitigation Plan

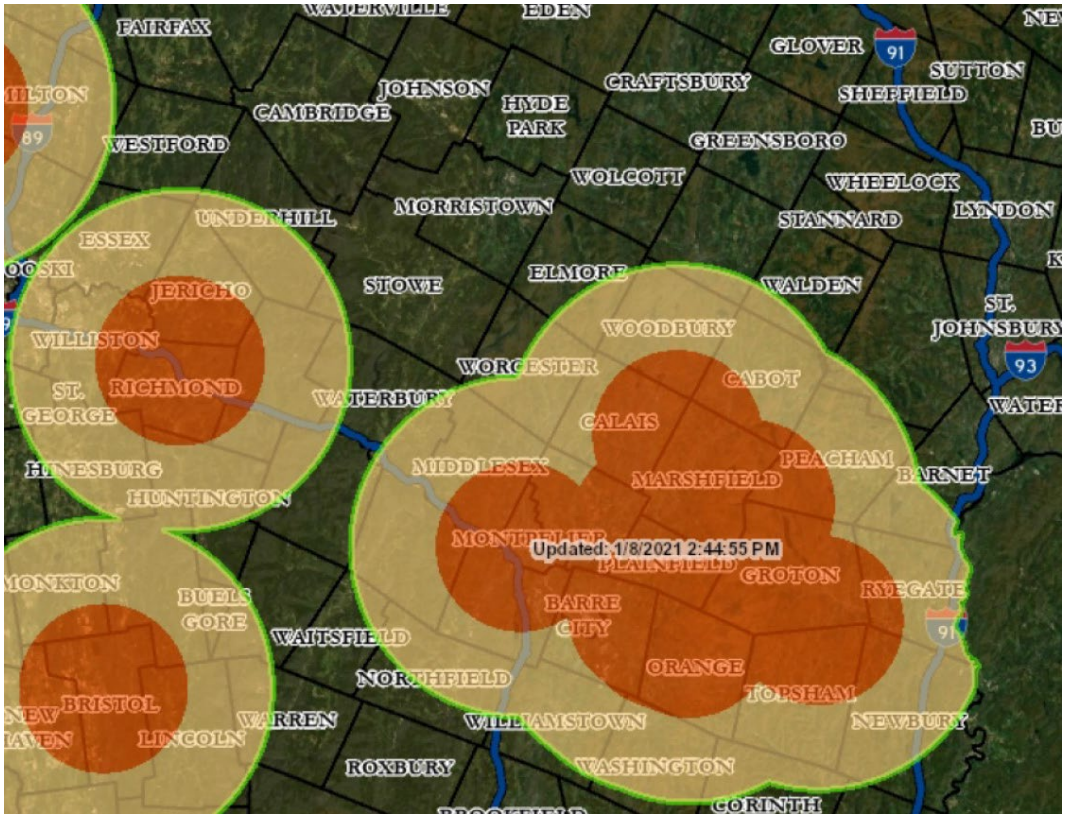


Figure 6: EAB Infested Area as of January 2021. Source: ANR Atlas

The Vermont Urban and Community Forestry program offers annual grants to support the development of sustainable urban and community forestry programs at the local level. This funding is considered seed money to help communities care for tree canopy and foster tree stewardship by taking the necessary actions to develop and sustain a community-wide tree program.

In 2019, the Town of Calais, in consultation with CVRPC, developed a Draft EAB Management Plan. The ash tree inventory found that:

- 66 of Calais' 73 miles of road had ash trees present (90% of the roadway miles). In total, 3,297 ash trees were inventoried.
- 81% of the trees along the roadside are in good or fair condition, leaving 11% of the trees in poor or dead condition. See **Table 10** for more info.
- 6% of inventoried trees are located in the utility ROW, and will be need be removed by the utility provider (Green Mountain Power, Hardwick Electric, and Washington Electric Co-op).

A map showing ash tree density along roadways is included in the **Attachments**.

Table 10: Ash Tree Inventory from 2019 Draft EAB Management Plan							
	Condition						
Diameter Class	Unknown	Dead	Fair	Good	Poor	Vacant	*Total*
1-12 Inches	203	14	152	1624	111	8	*2112*
12-24 Inches	66	19	135	653	145	2	*1020*
24+ Inches	8	8	22	76	51	0	*165*
Total	*277*	*41*	*309*	*2353*	*307*	*10*	*3297*

The plan outlines three options for management of ash trees:

- **Option 1: Preemptive Management:** Remove ash trees along rural roads prior to EAB infestation, and, if appropriate, replace with tree species that do not host EAB.
- **Option 2: Selective Management:** Manage and protect high value ash trees in selected areas. Leave trees in other areas (woodlands and parks) unmanaged, or managed under the guidance of the community tree warden. Monitor trees regularly for their health and levels of EAB infestation. Could also include insecticide treatment of EAB and ash tree removal where financially and culturally appropriate. Remove trees along rural roads before/at early infestation to reduce risk and long term cost.
- **Option 3: Reactive management:** Manage and maintain ash trees the same as other trees in the community. Remove hazard trees along roadside as issues arise.

In January 2020, the Calais Conservation Commission met with the Selectboard to discuss the EAB problem, presenting the three management options discussed above. The Selectboard asked the Commission to use the 2019 inventory to identify trees that should be prioritized for removal, and allow the Town to determine if the scope of this project is attainable within the current Road Crew schedule. This work is ongoing, and has not yet resulted in any general plan for removals. To raise public awareness of EAB infestation, the Commission has also flagged ash trees along three well-traveled stretches of Calais roadsides (western end of Lighting Ridge Road, southern end of North Calais Road, and section of West County Road), installing laminated "This is an Ash Tree" poster at the beginning and end of each corridor.

In summer 2020, the Calais Conservation Commission hung three EAB traps in selected locations as part of a state project. No EAB were found in these traps.

Chervil

Wild Chervil is a weed belonging to the parsley family (Apiaceae). It is becoming a serious problem in hay fields and pastures in Central Vermont. Its 3-4-foot height, fern-like leaves, and white flowers arranged in a compound umbel pattern are quite pronounced during late May to early July. It is commonly found along roadsides and in meadows in Central Vermont.

Figure 7: Wild Chervil, Anthriscus sylvestris. Photo Credit: VT Urban & Community Forestry

Over the past five years, this weed has spread rapidly. It propagates by both seed and by lateral budding at the top of the root. It competes aggressively with forage crops for light, water and nutrients and often kills off the surrounding vegetation by shading it. It is particularly damaging to forage crops, but it has not been a problem in cultivated or tilled fields.

Wild chervil is not poisonous to livestock. Although it is unpalatable when large, animals will graze it effectively when small. The stems are very slow to dry and, if harvested in forage, will reduce crop quality due to molding. This weed also serves as a host for the parsnip yellow fleck virus that infects carrots, celery, and parsnips.

Wild chervil is very difficult to control because of its extremely deep taproot and tolerance to selective herbicides. Rosettes and immature plants can be controlled by digging out the roots. Mature plants must be removed below the root crown to prevent resprouting.

The 2019 Resilient Roadside Right of Ways Report, prepared by Joanne Garton of the Vermont Urban and Community Forestry Program, notes "in Calais, the prevalence of active agricultural fields, thin roadside hedgerows, and extensive forest edge creates a landscape prone to spreading invasive species." To combat the spread, the Town has developed a mowing policy recommended in the plan, including mowing before plants produce flowers (late May, early June) and cleaning mowing equipment between road segments. The Town purchased a roadside mower to use at various times throughout the season to help reduce spread. Current town funds allow for mowing of invasives twice during each season.

Table 11: Invasive Species Hazard Risk Assessment					
Hazard	*Location*	*Vulnerability*	*Extent*	*Impact*	*Probability*
Invasive Species	EAB: See attachments for roadways with ash trees Chervil: roadside, agricultural fields	Roadways, trees, utility ROW (6% of inventoried trees are located in the utility ROW, and will be need be removed by the utility)	11% of ash trees inventoried in poor/dead condition Peak mortality from EAB infestation expected between years 11 and 16. Likely that ash trees will start to die w/in 5 years.	Cost of ash tree removal unknown Estimated that 95% of ash trees will die after 15 years with peak mortality in years 11 and 16 (based on mortality rates seen in EAB infestation in Midwest)	Highly likely; typically takes 3 years after detection for ash trees to start dying; Town will likely see mortality within 5-10 years.

6.3 Pandemic

The Vermont State Hazard Mitigation Plan states, "*an epidemic emerges when an infectious disease occurs suddenly in numbers that are in excess of normal expectancy. Infectious disease outbreaks put a strain on the healthcare system and may cause continuity issues for local businesses. These outbreak incidents are a danger to emergency responders, healthcare providers, schools, and the public. This can include influenza (e.g. H1N1), pertussis, West Nile virus, and many other diseases*." The World Health Organization defines pandemic as "*an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people*"[3].

The most recent pandemic was the influenza (H1N1) pandemic of 2009-2010. The H1N1 flu was relatively mild, but killed three people in Vermont. The locations of those deaths have not been reported.

The novel coronavirus (SARS-CoV-2) was first detected in China at the end of 2019. It has now spread to more than 100 locations internationally, including the United States. The disease the virus causes has been named "coronavirus disease 2019" (abbreviated "COVID-19").

[3] https://www.who.int/bulletin/volumes/89/7/11-088815/en/#:~:text=A%20pandemic%20is%20defined%20as,are%20not%20considered%20pandemics.

Major dates in the COVID-19 pandemic include:

- December 2019: First human cases of COVID-19 reported by officials in Wuhan, China
- January 21, 2020: U.S. Centers for Disease Control (CDC) confirms first case of COVID-19
- February 2020: United States declares public health emergency due to COVID-19 outbreak.
- March 7, 2020: Health officials announce first case of novel coronavirus in Vermont
- March 11, 2020: State Emergency Operations Center (SEOC) partially activates in response to COVID-19
- March 11, 2020: World Health Organization (WHO) confirms COVID-19 is now a pandemic
- March 13, 2020: COVID-19 is declared a national emergency
- March 13, 2020: Governor Phil Scott declares a state of emergency in Vermont
- March 16, 2021: The Calais Town Office closed to the public and remains closed as of the writing of this plan. All town meetings are being held remotely.
- March 24, 2020: Governor Scott enacts a 'Stay Home, Stay Safe' order directing closure of in-person operations for all non-essential businesses, requiring remote work if possible, and directing residents to reduce trips outside the home to limit human-to-human contact.
- April 10, 2020: Stay Home, Stay Safe order extended to last until May 15, 2020. It has been extended monthly since then.
- April 17, 2020: Governor Scott issues phased "restart" plan
- January 27, 2021: Vaccinations begin for Vermonters age 75+
- April 6, 2021: Governor Scott releases Vermont Forward Plan- phased reopening guide
- April 19, 2021: Vaccinations for all Vermonters age 16+ open
- June 15, 2021: State of Emergency expires and is not renewed.

As of the writing of this plan (August 2021), there have been:

- Statewide: 25,219 cases, 260 deaths
- Washington County: 1,980 cases; 15 deaths
- Calais: 29 cases, deaths unknown

As shown in **Figure 8**, cases in Washington County increased sharply in November and December and have continued to climb into 2021, plateauing in April 2021, and

beginning to climb again in Summer 2021. Individuals 60+ are especially vulnerable to pandemics including COVID-19.

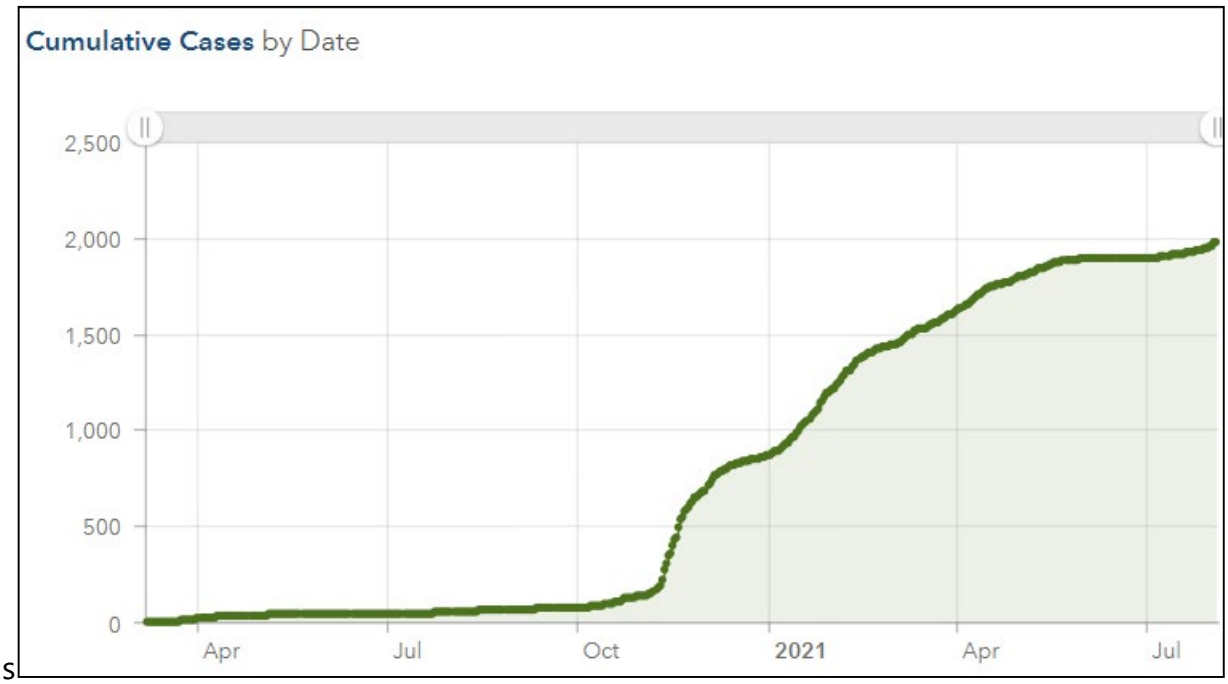


Figure 8: COVID-19 Cumulative Cases by Date in Washington County. Source: VDH COVID-19 Public Dashboards

As shown in **Figure 9**, 54% (1067) of COVID-19 cases in Washington County have been in residents age 40 or younger, while 47% of cases have been in residents age 40 or older.

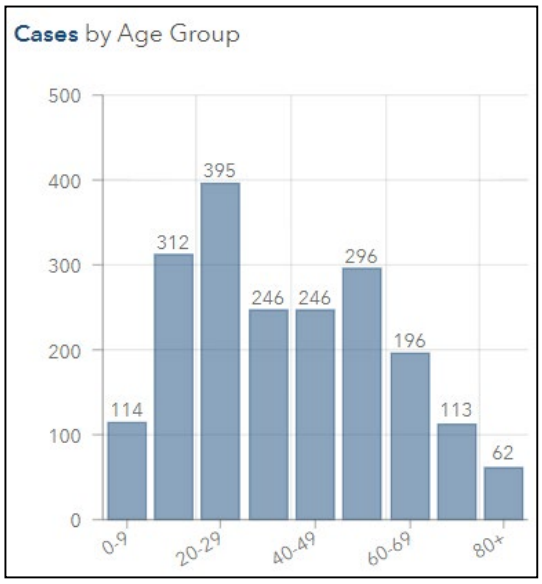


Figure 9:COVID-19 Cases in Washington County by Age Group. Source: VDH COVID-19 Public Dashboards

To mitigate impacts from COVID-19, the Town implemented several policies and procedures including:

Resident Socioeconomic Support

- Developed a COVID-19 Community Relief Survey for those seeking or providing assistance (see **Figure 10**)
- Set up a mutual aid email address where residents could request or offer support

Changes to Town Services

- Closed the Town Office to the public on March 16, 2021

- Purchased Zoom license to allow Boards, Commissions, and Committees to meet remotely
- Installed a new phone system to allow residents to reach Town staff more easily without visiting the Office, purchased new laptops, and upgraded Town website
- Improved digital access to Town records to allow virtual handling of record requests and eliminating need for direct contact with Town Office staff
- Installed Wi-Fi hotspot to provide residents with point of access for telehealth and remote learning
- Attended Governor Scott's bi-weekly press conferences, weekly State Emergency Operations Center (SEOC) briefings, and providing updates to residents via the Town website on the current health and safety guidance from the Vermont Department of Health and the Governor
- Sanitized Town Garage and implemented health and safety protocols for Road Crew

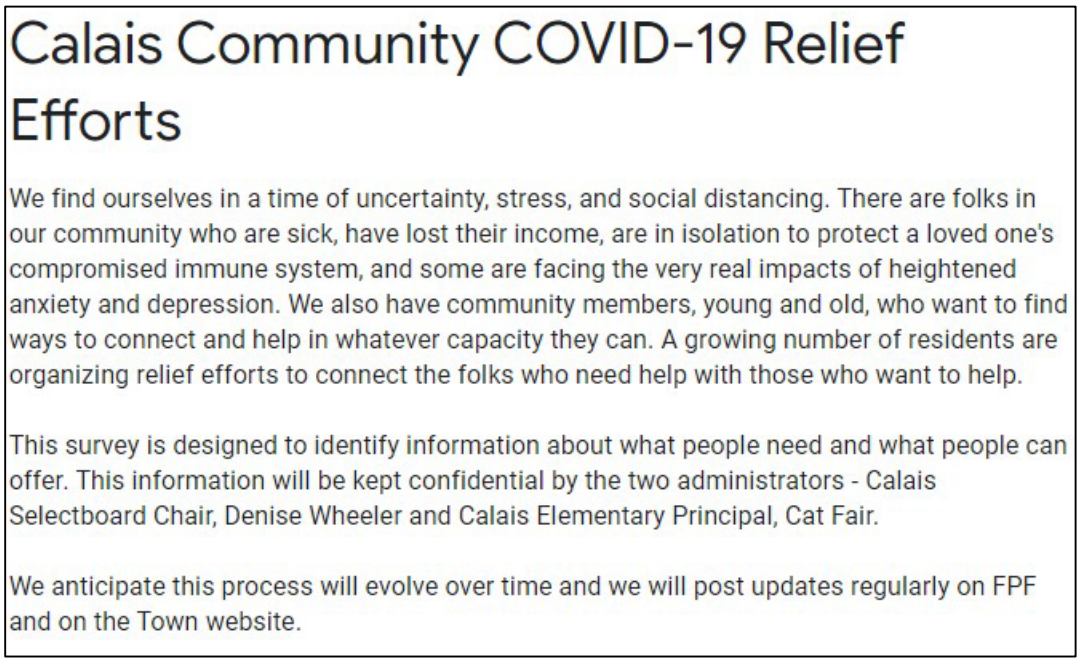


Figure 10: Calais Community Relief Survey. Source: calaisvermont.org

The scale and complexity of COVID-19 has not been seen in this country since the 1918 Spanish Flu. With a major pandemic, the hazard to Calais is its effect on individuals, vulnerable populations, the medical system, and the economy. The current evolving situation makes it impossible at this time to fully understand and capture short and long term impacts in this LHMP. Some impacts noted by the LHMP Planning Team include

- Food insecurity - two local grocery stores are offering curb side pickup and Planning Team members noted sales have surged. Additionally, the mutual aid network has delivered food and supplies to multiple households.

- Changes/reduction in Town services due to social distancing and health and safety requirements, as noted above (furloughed Road Crew staff for example)
- Potential impacts on town revenue due to loss of income - unknown at this time.

Table 12: Pandemic Hazard Risk Assessment					
Hazard	*Location*	*Vulnerability*	*Extent*	*Impact*	*Probability*
Pandemic	Town wide, County wide, state wide	Seniors, housebound residents, low-income population (more likely to experience food insecurity)	Severe Statewide: 25,219 cases, 260 deaths Washington County: 1,980 cases; 15 deaths --Calais: 29 cases, deaths unknown --Washington County case rate: 260.7 per 10,000 people --State mortality rate: 1.1%	Unknown at this time; may impact tax revenues in FY22 and FY23.	Unknown; may reoccur seasonally

6.4 Drought

Drought is a period of unusually dry weather that persists long enough to cause problems, such as crop damages or water shortages (Vermont DEC). As noted in the State Hazard Mitigation Plan, "*droughts are a complex phenomenon that are difficult to monitor and assess because they develop slowly and cover large areas.*" The State Plan further states, *"…even though the state usually has adequate rainfall, droughts occasionally occur…moderate and mild droughts are much more common…In general, severe droughts are not frequent occurrences in Vermont."*

There are four types of drought[4]:

- **Meteorological**: a reduction in rainfall from a normal precipitation pattern in regard to the amount, intensity, or timing of the event as well as changes in the temperature, humidity, and wind patterns (United States defines meteorological drought as receiving less than 2.5 mm of rainfall in 48 hours). Meteorological drought is the first drought stage detected.
- **Agricultural**: deficient moisture conditions that cause a lasting effect on crops and non-natural vegetation
- **Hydrological**: related to the effects of decreased precipitation on surface or subsurface water supply. It is the last stage of drought and is lagged behind

[4] http://drought.unl.edu/DroughtBasics/TypesofDrought.aspx

meteorological and agricultural drought because water infiltrates down to the groundwater during the latter portion of the hydrological cycle.

- **Socioeconomic**: what happens when the consequences of the drought start to affect the socioeconomic sector; occurs when the demand for an economic good is greater than the available supply due to weather-related drought (examples: water, hydroelectric power, food grains, meat, dairy, etc.)
- **Ecological**: a prolonged and widespread deficit in naturally available water supplies — including changes in natural and managed hydrology — that create multiple stresses across ecosystems.

> *"Vermont has a highly variable, unpredictable climate. Droughts, while low frequency hazards, are of serious concern to the population of Vermont. It is often difficult to recognize the onset of a drought during its preliminary stages, and together with Vermont's variable climate can lead to the disregard for the seriousness of an oncoming drought. Even though the State usually has adequate rainfall, droughts occasionally occur."*
>
> 2018 State Hazard Mitigation Plan

The severity of a drought depends on the duration, intensity, and geographic extent of the water shortage, as well as the demands on the area's water supply. The USDA rates droughts from D0–D4, depending on the severity of the drought, the amount of time it will take for vegetation to return to normal levels, and the possible effects of the drought on vegetation and water supply (**Figure 11**). Additionally, the state SHMP states that due to climate change, by the end of the century, short term droughts could occur as much as 1 time a year in some places.

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures Coming out of drought: some lingering water deficits pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies

Figure 11: Drought Classification. Source: United States Drought Monitor

Droughts can cause localized deficiencies in water, leaving wells dry, causing crop damage, and causing restriction on water usage. As shown below in **Figure 12**, Washington County has experienced drought at DO (abnormally dry or above) almost every year since 2015. In 2017, 7% of Washington County was at D2-D4 level. Since 2000, the longest duration of drought in Vermont lasted 45 weeks, from June 21, 2016 to April 25, 2017. The most intense period of drought occurred the week of September 29, 2020, where 29% of Vermont was at level D2 (United States Drought Monitor). In November 2020, ten Vermont Counties, including Washington County, were designated as "primary natural disaster areas" by the United States Department of Agriculture as a result of the 2020 drought[5]. Specific impacts in Calais are unknown.

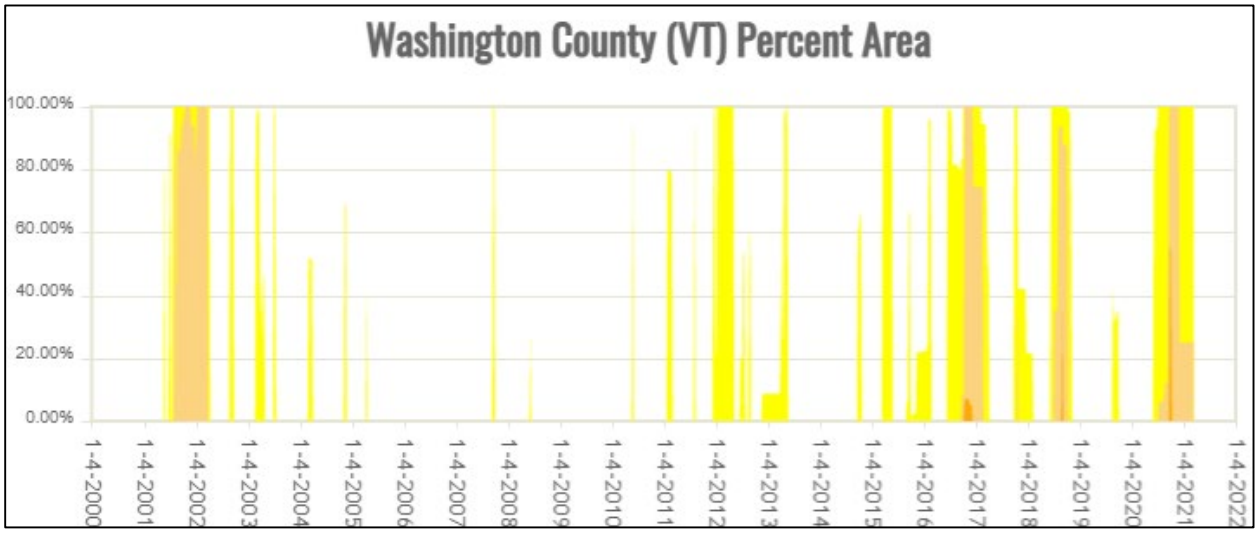


Figure 12: Washington County Drought over Time. Source: United States Drought Monitor

[5] https://www.fsa.usda.gov/news-room/emergency-designations/2020/ed_2020_1118_rel_0286

In consultation with Vermont Emergency Management, the Vermont Agency of Natural Resources developed a Drought Plan in response to the 2001-2002 drought to guide its activities in response to droughts and extended periods of dry weather. The plan outlines operating procedures, responsibilities of various programs, and sequence of actions to be followed based on the severity of the situation. This plan was updated for inclusion in the 2018 State Hazard Mitigation Plan. Additionally, the Drinking Water and Groundwater Protection Division developed a Groundwater Management Strategy in 2018 to "help ensure adequate quantity and quality of groundwater, including during periods of drought" (2018 SHMP).

Drought is a hazard of concern in Calais due to the reliance of Calais residents on private wells and springs. These groundwater sources can lower during seasons of drought. There are 2 public water systems in Calais; all other residents use private wells or are supplied with water from their own springs. The public water supply in East Calais Village, owned and operated by the East Calais Fire District #1 (ECFD), is available for use specifically to East Calais Village residents. Water in this system comes from two springs. LHMP Planning Team members noted that East Calais Village residents have experienced multiple issues with ECFD supply. The Town Plan notes that "the ECFD #1 water system cannot support any new connections without increasing the reservoir capacity. This means limiting new growth within existing village limits." In the event of a drought these water supplies are vulnerable. LHMP Planning Team members also noted receiving anecdotal information of personal wells having supply issues. Additionally, Calais residents use Curtis Pond dam for drinking water; this would be vulnerable if Curtis Pond dam were to breach.

The Town also is concerned that climate change may pose an increased risk of drought, which can have a potential impact on the water supply. A review of the Vermont State Hazard Mitigation Plan provides a greater explanation of this hazard and possible mitigation strategies to address drought.

Table 13: Drought Hazard Risk Assessment

Hazard	*Location*	*Vulnerability*	*Extent*	*Impact*	*Probability*
Drought	Town-wide	Residents of Calais using ECFD #1 supply, private wells, and Curtis Pond water	Up to 50 Calais residents use ECFD #1 supply, many residents have private wells. Reduced water supply; could also lead to reduced food output, affect natural habitats	Reduction/ loss of water supply for Calais residents	Moderately likely supply may decrease during season of drought in the future

6.5 Dam Failure

Five dams exist in the Town of Calais, as shown in **Table 14.**

Table 14: Dams of Concern in Calais

Name	*Date construction completed*	*Type*	*Dimensions*	*Reservoir size (acres), acre ft. of water stored*	*Maximum capacity (acre ft.)*	*Hazard Class*
Curtis Pond Dam	1900	Earthen embankment	120 ft. x 14 ft.	76 acres, 742 acre ft.	1,000 acre ft.	Significant Hazard Potential
Adamant Pond Dam	1870	Concrete, Stone, Gravity	119 ft. x 10 ft.	50 acres, 150 acre ft.	230 acre ft.	Significant Hazard Potential
No. 10 Pond Dam	1820	Earth, Stone, Masonry	125 ft. x 8 ft.	86 acres, 390 acre ft.	540 acre ft.	Significant Hazard Potential
E. Calais Dam	1900	Concrete, Gravity	100 ft. x 18 ft.	6 acres, 29 acre ft.	53 acre ft.	Low Hazard Potential
Robinson Pond Dam	Unknown	Unknown	Unknown	0.9 acres, 4 acre ft.	Unknown	Low Hazard Potential

As shown in **Table 14**, all of the dams are in excess of 100-years old. According to the Agency of Natural Resources Vermont Dam Inventory (VDI), all are privately owned. Three of the five dams have been classified as "Significant Hazard Potential", where a breach would cause appreciable economic loss (see **Figure 13)**. The dams of most concern to Calais LHMP Planning Team members are Curtis Pond Dam and Adamant Pond Dam. Additionally, the SHMP notes that heavy rainfall events and flood events are more likely, which could increase probability of dam failure in the future.

CLASS	HAZARD CATEGORY	POTENTIAL LOSS OF LIFE	POTENTIAL ECONOMIC LOSS	INSPECTION FREQUENCY
3	Low	None expected (No permanent structures for human habitation)	Minimal (Undeveloped to occasional structures or agriculture)	5-10 years
2	Significant	Few (No urban developments and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry or structures)	3-5 Years
1	High	More than few	Excessive (Extensive community, industry or agriculture)	1 Year (Annually)

Figure 13: Downstream Hazard Classification System. Source: Vermont DEC, Division of Dam Safety

Curtis Pond Dam – In 2004, the Calais Selectboard developed a Curtis Pond Dam task force to determine replacement strategies. The Committee identified risk factors, status, and possible engineering solutions for each site. They also produced an Emergency Action Plan for the Curtis Pond Dam (2004). This EAP was updated in 2019 with current contact information. In 2006, Calais voters were asked to give their opinion to the Selectboard about various options for the possible repair and maintenance of the Curtis Pond Dam. Engineering studies have not determined the actual problem with the dam, but do indicate that there is a slow leak with gradual erosion of the dam. Replacement options estimates range from $175,000 - $230,000. A 2019 Dam Hazard Class Assessment Report completed by Schnabel Engineering found that there are 2 structures downstream of the dam that would be impacted by a sunny day breach, with 0 to 3 feet of water inundation. Nine (9) structures (8 residential, 1 store - Maple Corner Community Store) would be impacted by a rainy day breach with inundation levels of 1.5 to 3.9 feet. An inundation map from the Assessment Report is included in the **Attachments.**

The Curtis Pond Homeowners Association, formed in 2017, works to "Preserve and enhance the environment and natural beauty of Curtis Pond". There are no specific plans to pursue funding to have the dam rebuilt or replaced as of the writing of this plan.

Additionally, a Washington Electric Coop (WEC) substation is located within the potential inundation area. According to WEC and based on information in the engineering study, the expected water level would reach approximately 2 to 2.5 feet

high in the substation for a relatively short period of time, in which case the equipment in the substation would not be harmed. In this event, the water would flow in a manner that would not create significant erosion thus limiting damage to the access road(s). If the water rose to a level of 4 feet or higher, however, significant components of the substation would be damaged. The cost of repair to critical components would be $250,000 to $400,000.

Figure 14: View of Dam and Spillway from Downstream Side. Source: 2019 Dam Hazard Class Assessment Report. Schnabel Engineering

In July 2019 DEC conducted a visual dam safety inspection, evaluating the condition of the dam as poor, meaning "significant structural and or operation and maintenance deficiencies are clearly recognized under normal loading conditions". The inspection report notes "numerous deficiencies that make it susceptible, including an undersized spillway that could lead to overtopping during a storm event and erosion/destabilization of the dam", further stating "A project to address these deficiencies and reduce the risk associated with the dam should be pursued as soon as possible". Specific concerns include:

- Downstream face (dry-set masonry wall) in poor condition; evidence of wall tilting, enlarged masonry joints, and cracked stone in some areas- conditions that indicate load shifting and settlement/stressing of the wall. Wall could be susceptible to failure during severe loading conditions
- Spillway in poor condition
- Drawdown facility is inoperable, no means to readily lower water level in an emergency
- Seepage/leakage throughout the dam which will continue to weaken embankment

- Dam overtops during events less than the 50 year storm; dam is considered hydraulically inadequate

Recommendations from the report include:

- EAP should be updated at least every 2 years; inundation maps from 2019 Schnabel Engineering study should be compared to 2004 EAP maps and potentially replace 2004 maps.
- Alternatives to stabilize downstream masonry wall should be evaluated

Adamant Pond Dam – A beaver dam found some fifty feet above the Adamant Pond Dam failed on May 3, 2010. According a WCAX news article, over 2 million gallons of water flowed from the dam and caused flood waters more than 4 feet deep at times. The flood waters washed out a section of the main road in Adamant Village and caused seven homes to be evacuated. At right is a picture of the flooding in downtown Adamant. Since the flooding event, beaver baffles - contraptions of black piping and fencing - have been installed and are being continuously monitored.

Table 15: Dam Failure Hazard Risk Assessment					
Impact	*Probability*	*Vulnerability*	*Extent*	*Impact*	*Probability*
Dam Failure	Area downstream from Curtis Pond Dam and Adamant Pond dam	Curtis Pond Dam: Maple Corner Store, 8 houses (West County Road, Kent Hill Road), roads, culverts, electrical substation, Town Hall and the Kent Museum	2010-Adamant Dam breach; flood waters 4 ft. deep; 7 homes evacuated in Adamant Village	Curtis Pond: 9 properties inundated; WEC substation repairs in event of >4ft flow estimated at $250,000-$400,000; repairs to three significantly affected roads estimated to range from $400,000-500,000	High; Classified as a "significant hazard" dam by VT DEC. No obvious structural changes noted since 2015. Engineering studies cite gradual deterioration; without repair/rebuild, dam failure is likely but no time estimate given

7. Mitigation

7.1 Municipal Plan Goals and Policies that Support Local Hazard Mitigation

- Minimize scattered development patterns and protect open space, agricultural soils and other natural resources outside of village districts.
- Mitigate dam failure hazards.
- Mitigate risks in flood hazard areas.
- Provide ready access to flood hazard related information.
- To protect ground water sources [recharge areas] so that drinking water is safe for all residents.
- Encourage conservation of water methods such as alternate water storage.
- To provide education about a Green Infrastructure Plan for surface water and storm water management.

Calais' Town Plan will be updated in 2021. The Town is interested in expanding on goals which relate to mitigation planning goals.

The goal of this hazard mitigation plan is to take actions to reduce or eliminate the long-term risk to human life and property from:

- Fluvial Erosion & Inundation Flooding
- Invasive Species
- Pandemic
- Drought
- Dam failure

Specific hazard mitigation strategies related to goals of the Plan include:

- Ensure existing and future water management systems are adequate and functioning properly.
- Preserve and limit development in areas where natural hazard potential is high, in accordance with Calais Town Plan and bylaws.
- Ensure that all residents and business owners are aware of the hazards that exist within Calais and ways they can protect themselves and insure their property.
- Ensure that emergency response services and critical facilities functions are not interrupted by natural hazards.

Over the course of the next five years, Calais will look into incorporating more mitigation planning into their daily planning activities and projects. The mitigation goals and strategies outlined in this Local Mitigation Plan are the first steps in making Calais more

disaster resistant. The hazards identified in this plan have the greatest potential impacts and damage and are the priority hazards for the Town of Calais. In order to have continuous achievement of mitigation goals and implementation mitigation strategies, the Town will spend time each year assessing progress of and future funding sources for the outlined mitigation strategies. This session can be performed during an annual meeting of the LHMP Planning Team, with the support of CVRPC as funding allows.

7.2 Identified Hazard Mitigation Programs, Projects & Activities

Hazard mitigation programs, projects and activities that were identified for implementation at the LHMP Planning Team meetings are listed below in **Table 16**.

*SB= Selectboard
**PC= Planning Commission
***VEM= Vermont Emergency Management
****ECFD= East Calais Fire District

Table 16: 2021 to 2026 Mitigation Actions					
Hazard Mitigated	*Mitigation Action*	*Local Leadership*	*Prioritization*	*Possible Resources*[6]	*Time Frame*
All hazards	Establish VT Alert town account	SB* w/ assistance from EMD as needed	Medium	VEM, CVRPC	2022-2023
All hazards	Add information to Emergency Management section on the Town Website that is easy to access and to understand. Information to include • Flood Resilience portal with relevant ANR, FEMA NFIP links. • Calais Online Map updated to include graphic data with regard to SFHA and River Corridors • LOMA resources and FHO construction standards LEMP, Emergency Action Plan for Curtis Pond, and LHMP	Town Web Master, CVPRC	High	Town Budget	2022- 2023
Fluvial Erosion/ Inundation Flooding	Review options to join Community Rating System	SB* w/ assistance from PC** as needed	Medium	CVRPC	2022-2024
Fluvial Erosion/ Inundation Flooding	Enforce storm water and erosion control measure on updated bylaws when completed: Educate property owners on proper erosion control measures as outlined in the State Best Mgmt. Practices using state 1pgers, etc.	Zoning Administrator/PC	Medium	Town budget, DEC	2022-2024

[6] HMGP – Hazard Mitigation Grant Program, EMGP – Emergency Management Grant Program, PSIC/NTIA – National Telecommunications and Information Administration, USDA – United States Dept. of Agriculture

Table 16: 2021 to 2026 Mitigation Actions					
Hazard Mitigated	*Mitigation Action*	*Local Leadership*	*Prioritization*	*Possible Resources*[6]	*Time Frame*
Fluvial Erosion/ Inundation Flooding	Upgrade and replace culverts identified as "poor" condition in CVRPC culvert inventory (could include project sites identified in Kingsbury Branch SWMP)	SB* in coordination w/ Road Crew and Operations Manager	High	VTrans grants, FEMA mitigation grants	2021-2026
Fluvial Erosion/ Inundation Flooding	Upgrade segments identified as Very High Priority in Road Erosion Inventory (could include project sites identified in Kingsbury Branch SWMP)	SB in coordination w/ Road Crew and Operations Manager	Medium	Grants (DEC, VTrans), CVRPC assistance, Town budget	2022-2025 (very high priority segments to be completed by 2025)
Fluvial Erosion/ Inundation Flooding	Implementation of stormwater projects identified in Kingsbury Branch SWMP (Marshfield Road, Calais Town Garage, Calais Elementary School)	SB in coordination w/ CVRPC, Road Crew	Medium	CVRPC, DEC grants	2022-2026
Fluvial Erosion/ Inundation Flooding	Replace Pekin Brook culvert on Kent Hill Road	SB in coordination w/ VEM***, CVRPC	High	BRIC	Apply for 2021 BRIC, scoping study 2022-2023/2024
Fluvial Erosion/ Inundation Flooding	Replace bridge on Route 14 near intersection of Pekin Brook Rd.	VTrans	High	VTrans grants	Summer 2022-Fall 2023
Fluvial Erosion/ Inundation Flooding, Dam Failure	Develop process to distribute information on shelter locations on FPF, website, tax bills- "did you know" ¼ pager	SB in coordination w/ Town Clerk, Treasurer	High (opportunity to do it this year)	Town budget	Develop process in 2021/2022, distribute going forward

Table 16: 2021 to 2026 Mitigation Actions					
Hazard Mitigated	*Mitigation Action*	*Local Leadership*	*Prioritization*	*Possible Resources*[6]	*Time Frame*
Fluvial Erosion/ Inundation Flooding, Dam Failure	Add website banner advertising shelter locations and operation hours during emergency	Town Clerk	High (opportunity to do it this year)	Town budget	2021/2022
Fluvial Erosion/ Inundation Flooding	Develop and distribute info via tax or water bills to property owners in SFHA on flood hazards and importance of flood insurance to increase purchase of flood insurance policies, link to interactive map	Town Clerk in coordination w/ EMD	Medium	Town budget	Develop process in 2021/2022 and distribute annually going forward
Drought	Research water buffalo/additional supply should drought occur. Research feasibility of getting water from dry hydrants (see list in **Attachments**)	SB in coordination w/ subcommittee, VEM, Highway Operations Manager, ECFD****	Medium	Town budget, VEM mitigation grants	Conduct research and investigate options 2022-2025
Drought	Increase coordination and communication with ECFD; encourage ECFD to alert Town Clerk when supply is threatened to post info on website if appropriate, encourage ECFD to investigate grants available to help increase supply of water and improve pipelines	ECFD responsibility to communicate w/ Town Clerk to use Calais website for alerts	Medium	Town budget; ACCD grants	2022-2025
Dam Failure	Confirm that currently identified dam monitors as described in the EAP are still active in that role. Otherwise recruit new monitors.	Curtis Pond Association in coordination w/ EMD	High	Town budget	2022-2023

Table 16: 2021 to 2026 Mitigation Actions					
Hazard Mitigated	*Mitigation Action*	*Local Leadership*	*Prioritization*	*Possible Resources*[6]	*Time Frame*
Dam failure	As recommended in the dam EAP, explore the feasibility of installing a siphon pump for drawing down the pond water level in the event of imminent dam failure	Operations Manager in coordination w/ EMD	Medium	Town budget	2022-2024
Drought	Promote water conservation methods, education and awareness	Conservation Commission	Medium	Town budget (State BMPs)	2022-2025
Drought	Provide information sessions and workshops for instruction on collection of rain water and its uses and encourage other methods of water conservation.	Conservation Commission	Low/medium	Town budget	2022-2025
Drought	Evaluate the possibility of the Town to make bulk purchase of rain collectors for each village, so collected water may be available for area residents as needed	SB	Low/medium	Town budget	2022-2024
Invasive Species	Road crew with direction from SB will continue schedule of roadside mowing to mitigate spread of invasive species	SB/ Road Crew/ Conservation Commission	Ongoing, annual	Town budget	2022-2025 (Schedule updated annually in spring)
Pandemic	Develop Continuity of Operations Plan (COOP)	SB in coordination w/	Medium	CVRPC, Town budget	2022-2024
All hazards	Research possible funding resources for securing town records, building redundant systems for storing/retrieving town documents.	Selectboard in coordination w/ EMD, CVRPC	Medium	CVRPC, Town budget	2022-2024

1

VEM also emphasizes a collaborative approach to achieving mitigation on the local level, by partnering with ANR, VTrans, ACCD, Regional Planning Commissions, FEMA Region 1 and other agencies, all working together to provide assistance and resources to towns interested in pursuing mitigation projects and planning initiatives.

Table 16 lists mitigation activities regarding local leadership, possible resources, implementation tools, and prioritization. Prioritization was based upon the economic impact of the action, the Community's need to address the issue, the action's cost, and the availability of potential funding. The action's cost was evaluated in relation to its benefit as outlined in the STAPLEE[7] guidelines.

Calais understands that in order to apply for FEMA funding for mitigation projects, a project must meet FEMA benefit cost criteria. In addition, the Town must also have a FEMA approved Hazard Mitigation Plan.

A High prioritization denotes that the action is either critical or potential funding is readily available and should have a timeframe of implementation of less than two years. A Medium prioritization is warranted where the action is less critical or the potential funding is not readily available and has a timeframe for implementation of more than two years but less than four. A Low prioritization indicates that the timeframe for implementation of the action, given the action's cost, availability of funding, and the community's need to address the issue, is more than four years.

[7] A method of evaluating mitigation actions based on **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **E**conomic, **E**nvironmental criteria

Attachments

- Draft Template to Evaluate Effectiveness of LHMP at Achieving Purpose & Goals
- 2021 Areas of Local Concern
- Flood Hazard Overlay
- Curtis Pond dam inundation map
- 2017 Road Erosion Inventory: Summary Table
- Calais Road Erosion Inventory- Very High Priority Segments
- High Priority Culvert Inventory – Town of Calais- (Culverts in Critical, Poor, or Closed Condition)
- Culverts with High Erosion
- 2019 Kingsbury Branch Stormwater Master Plan: 20 Highest Ranking Sites
- Kingsbury Branch Stormwater Master Plan: 5 Highest Ranking Sites
- 2019 Ash Tree Management Plan: Density and Condition Map
- Ash trees in dead/poor condition
- List of Dry Hydrants in Calais as of May 2020
- Milone & MacBroom Pekin Brook Floodplain Mapping and Calais Town Hall Alternatives Analysis: Preferred Alternative
- 4/26/21 Selectboard Agenda
- Survey Results
- 5-year review and maintenance process

Draft Template to Evaluate Effectiveness of LHMP at Achieving Purpose & Goals

1. **Goal 1:** Ensure existing and future water management systems are adequate and functioning properly.
2. **Goal 2:** Preserve and limit development in areas where natural hazard potential is high, in accordance with Calais Town Plan and bylaws.
3. **Goal 3**: Ensure that all residents and business owners are aware of the hazards that exist within Calais and ways they can protect themselves and insure their property.
4. **Goal 4**: Ensure that emergency response services and critical facilities functions are not interrupted by all hazards

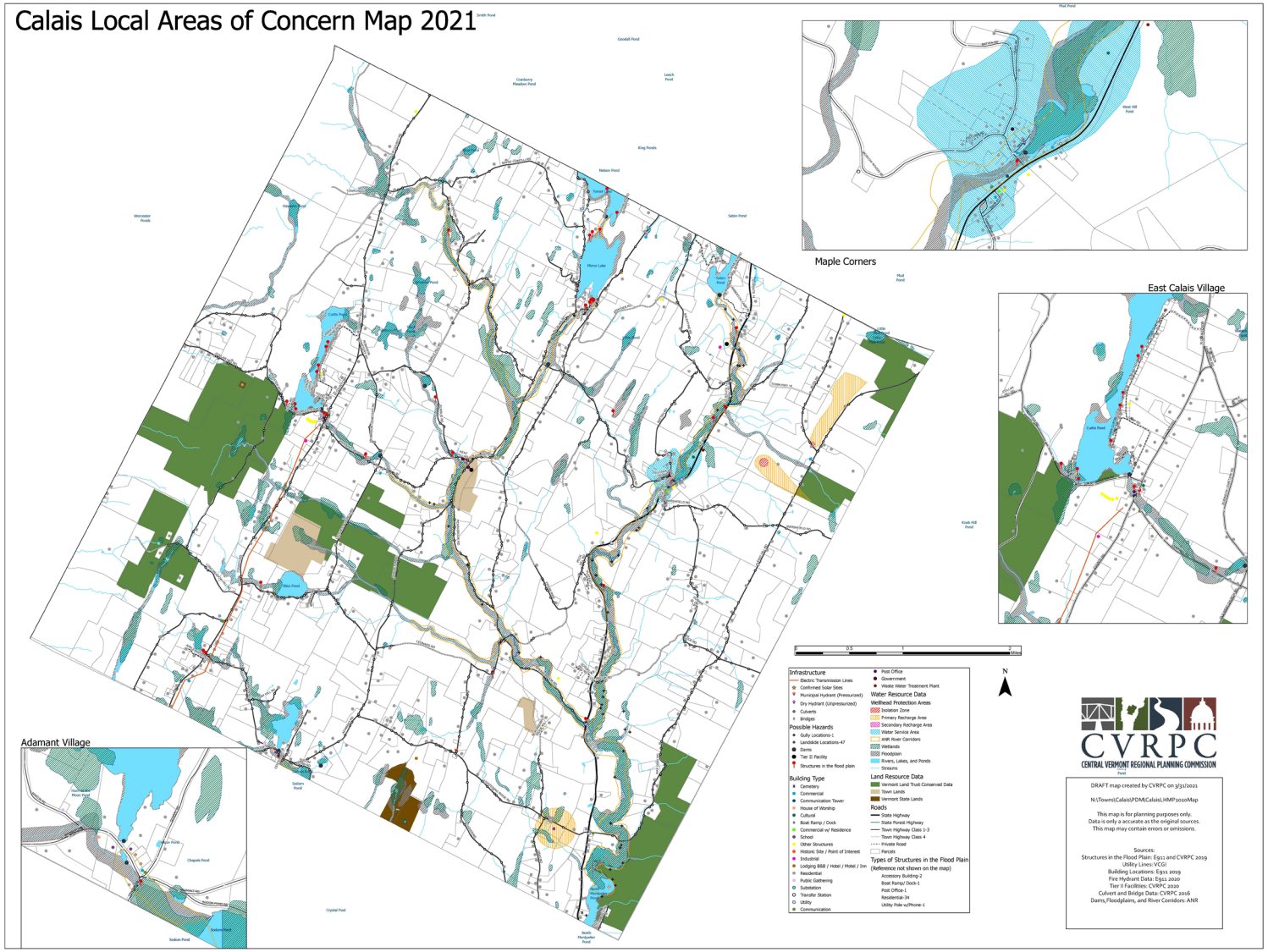
Evaluation Metric	Goal 1	Goal 2	Goal 3	Goal 4
# of culverts upgraded	X	X		
Infrastructure replaced/upgraded (bridge, culverts)	X			X
# of website visits following posting of info (dam inundation maps, etc.)			X	
# of people signed up for VT Alert after Town Account created (compare annually)			X	X
# of people who receive VT Alerts after Town Account created (compare annually)			X	X
Adoption of LEMP annually		X	X	X
COOPs updated annually		X	X	X
# of permits issued to administer and enforce Flood Hazard regulations		X		

Evaluation Metric	2022 Status
# of culverts upgraded	
Infrastructure replaced/upgraded (bridge, culverts)	
# of website visits following posting of info (dam inundation maps, etc.)	
# of people signed up for VT Alert after Town Account created (compare annually)	
# of people who receive VT Alerts after Town Account created (compare annually)	

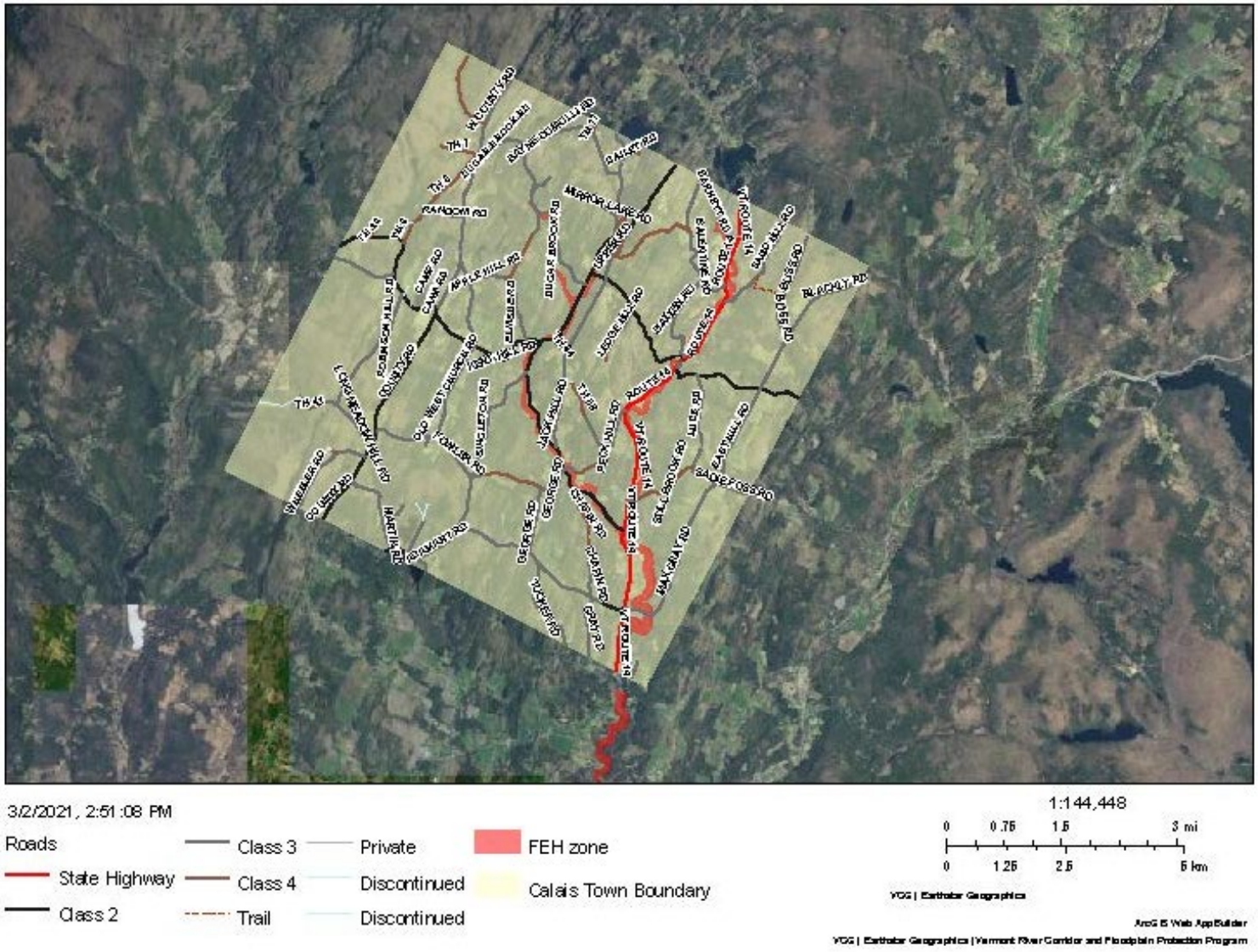
Adoption of LEMP annually	
COOPs updated annually	
# of permits issued to administer and enforce Flood Hazard regulations	

2021 Areas of Local Concern

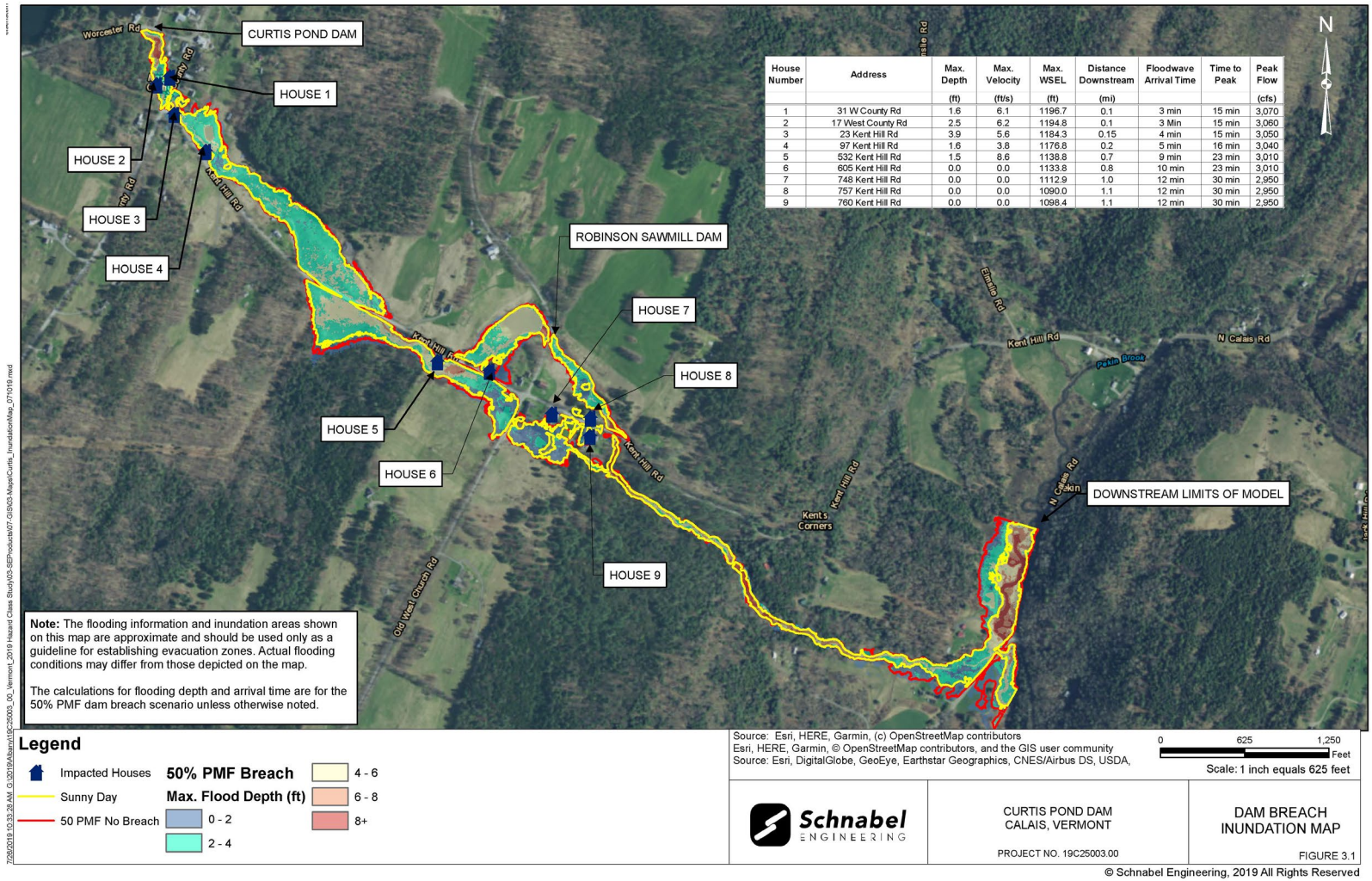
See full sized map at https://centralvtplanning.org/towns/calais/



Fluvial Erosion Overlay



Curtis Pond Dam Inundation Map (2019)

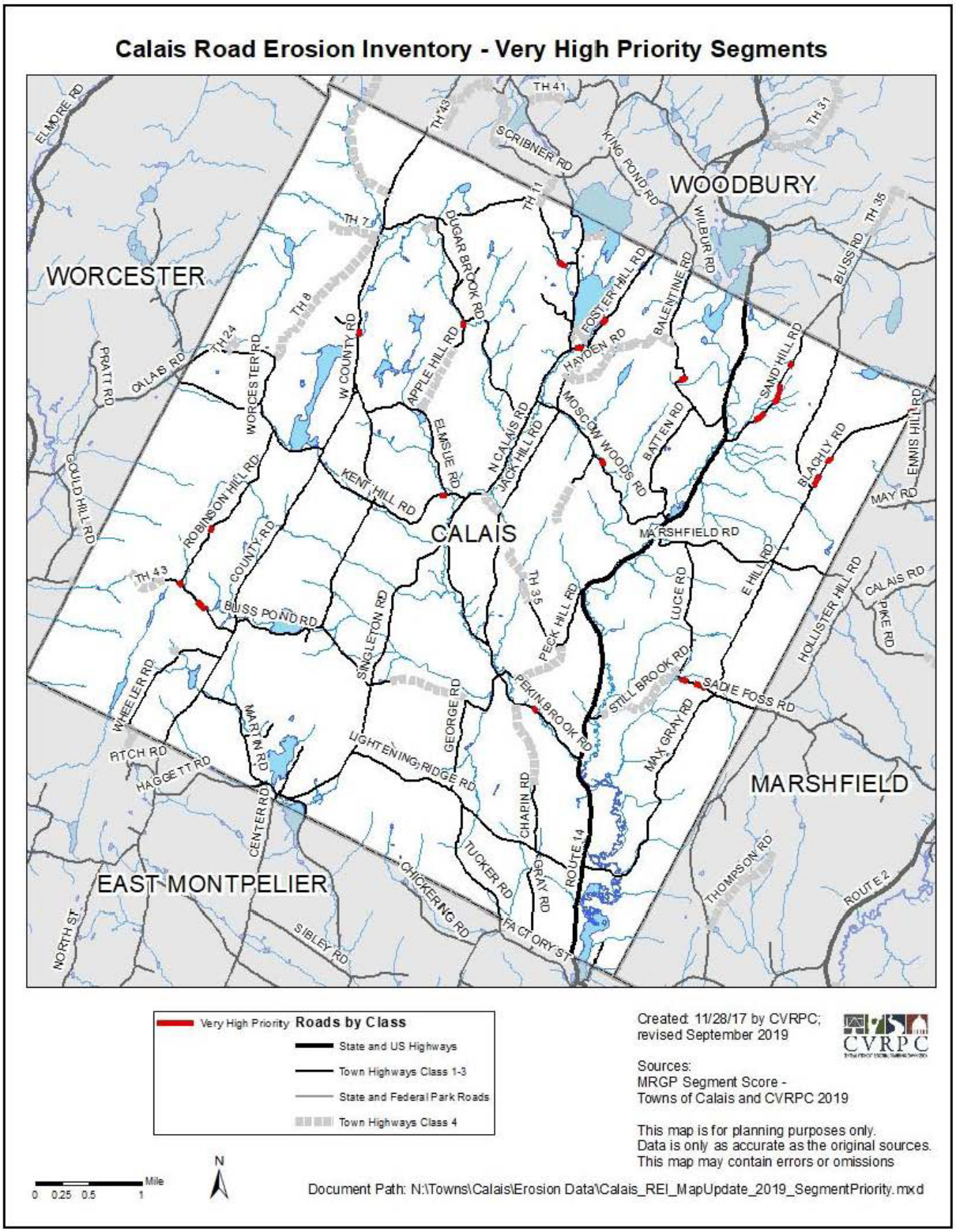


House Number	Address	Max. Depth (ft)	Max. Velocity (ft/s)	Max. WSEL (ft)	Distance Downstream (mi)	Floodwave Arrival Time	Time to Peak	Peak Flow (cfs)
1	31 W County Rd	1.6	6.1	1196.7	0.1	3 min	15 min	3,070
2	17 West County Rd	2.5	6.2	1194.8	0.1	3 Min	15 min	3,060
3	23 Kent Hill Rd	3.9	5.6	1184.3	0.15	4 min	15 min	3,050
4	97 Kent Hill Rd	1.6	3.8	1176.8	0.2	5 min	16 min	3,040
5	532 Kent Hill Rd	1.5	8.6	1138.8	0.7	9 min	23 min	3,010
6	605 Kent Hill Rd	0.0	0.0	1133.8	0.8	10 min	23 min	3,010
7	748 Kent Hill Rd	0.0	0.0	1112.9	1.0	12 min	30 min	2,950
8	757 Kent Hill Rd	0.0	0.0	1090.0	1.1	12 min	30 min	2,950
9	760 Kent Hill Rd	0.0	0.0	1098.4	1.1	12 min	30 min	2,950

2017 Road Erosion Inventory: Summary Table

Count of Priority	Priority					
Road Name	Very High	High	Moderate	Low	Total	Year
ADAMANT RD			2	2	4	
APPLE HILL RD	1		1		2	
BALENTINE RD	1		9	8	18	
BATTEN RD		1	2		3	
BAYNE COMOLLI RD	1	2	3		6	
BLACHLY RD	4	3	2	2	11	
BLISS POND RD		1	2	5	8	
BLISS RD				1	1	
BUTTERFIELD RD			1		1	
CENTER RD			1		1	
COLLAR HILL RD			1	2	3	
DUGAR BROOK RD		3	8	11	22	
DUKE RD		1	1		2	
E HILL RD		4	4		8	
ELMSLIE RD			6	1	7	
FIFERS RIDE				3	3	
FOSTER HILL RD	1	1	2	3	7	
FOWLER RD			5	1	6	
GEORGE RD		1	3		4	
GRAY RD		1	1	2	4	
HAGGETT RD		3	1	1	5	
KENT HILL RD	1		5	5	11	
LEDGE HILL RD		1	1	4	6	
LEONARD RD				1	1	
LIGHTENING RIDGE RD		1	3	4	8	
LONG MEADOW HILL RD	3	2	3	1	9	
LUCE RD	3	4	6	2	15	
MARSHFIELD RD		1	3	2	6	
MARTIN RD			4	8	12	
MAX GRAY RD		2	2		4	
MILL ST				1	1	
MIRROR LAKE RD			2	1	3	
MOSCOW WOODS RD	1	4	10	2	17	
N CALAIS RD	1		7	4	12	
NELSON POND RD			4	2	6	
NO 10 POND RD		1	1	3	5	

Count of Priority	Priority					
Road Name	**Very High**	**High**	**Moderate**	**Low**	**Total**	**Year**
OLD WEST CHURCH RD		2	2	1	5	
PECK HILL RD				3	3	
PEKIN BROOK RD	1	3	4	15	23	
QUARRY RD			3	3	6	
ROBINSON CEMETERY RD		2	1	4	7	
ROBINSON HILL RD	1		7	4	12	
SAND HILL RD	6	5	4	3	18	
SINGLETON RD		1		1	2	
SODOM POND RD			1	4	5	
STILL BROOK RD			1	1	2	
TH 18		1			1	
TOBY HILL RD		1	3		4	
TUCKER RD		1	2	2	5	
UPPER RD		2		3	5	
W COUNTY RD	1	6	4	7	18	
WHEELER RD		1	2	2	5	
WORCESTER RD		2	3	2	7	
Total	**26**	**64**	**143**	**137**	**370**	


Calais Road Erosion Inventory - Very High Priority Segments
WORCESTER
WOODBURY
CALAIS
MARSHFIELD
EAST MONTPELIER
ELMORE RD
TH 43
TH 41
SCRIBNER RD
KING POND RD
TH 31
TH 7
TH 35
BLISS RD
WILBUR RD
FOSTER HILL RD
BALENTINE RD
TH 8
DUGAR BROOK RD
W COUNTY RD
APPLE HILL RD
HAYDEN RD
SAND HILL RD
PRATT RD
CALAIS RD
TH 24
WORCESTER RD
ELMSUE RD
N CALAIS RD
JACK HILL RD
MOSCOW WOODS RD
BATTEN RD
BLAGHLY RD
ENNIS HILL RD
GOULD HILL RD
ROBINSON HILL RD
KENT HILL RD
MAY RD
COUNTY RD
MARSHFIELD RD
BLISS POND RD
SINGLETON RD
PECK HILL RD
LUCE RD
E HILL RD
HOLLISTER HILL RD
CALAIS RD
PIKE RD
WHEELER RD
STILL BROOK RD
SADIE FOSS RD
PERKINS BROOK RD
MAX GRAY RD
PITCH RD
HAGGETT RD
MARTIN RD
LIGHTENING RIDGE RD
GEORGE RD
CHAPIN RD
CENTER RD
TUCKER RD
GRAY RD
ROUTE 14
THOMPSON RD
ROUTE 2
CHICKERING RD
FACTORY ST
NORTH ST
SIBLEY RD
Very High Priority
Roads by Class
State and US Highways
Town Highways Class 1-3
State and Federal Park Roads
Town Highways Class 4
Created: 11/28/17 by CVRPC;
revised September 2019
CVRPC
Sources:
MRGP Segment Score -
Towns of Calais and CVRPC 2019
This map is for planning purposes only.
Data is only as accurate as the original sources.
This map may contain errors or omissions
Mile
0 0.25 0.5 1
N
Document Path: N:\Towns\Calais\Erosion Data\Calais_REI_MapUpdate_2019_SegmentPriority.mxd

High Priority Culvert Inventory – Town of Calais (Culverts in Critical, Poor, or Closed Condition)

Source: VTrans Culvert Inventory

Condition	Road	#	Condition	Road	#
Critical	Max Gray Road	4	**Poor**	ADAMANT RD	2
	Apple Hill Road	1		APPLE HILL RD	2
	Adamant Road	1		BALENTINE RD	1
Closed	Adamant Road	2		BAYNE COMOLLI RD	1
	Baletine Road	1		BLACHLY RD	3
	Batten Road	2		BLISS POND RD	8
	Bayne Comolli Road	3		BUTTERFIELD RD	2
	Chapin Rd	1		COLLAR HILL RD	2
	Collar Hill Rd	1		COUNTY RD	8
	County Rd	2		DUGAR BROOK RD	6
	Dugar Brook Rd	1		EAST HILL RD	1
	Fifers Ride	2		ELMSLIE RD	1
	Foster Hill Rd	3		FOSTER HILL RD	1
	Fowler Rd	1		FOWLER RD	6
	Gray Rd	2		GRAY RD	1
	Hagget Rd	2		JACK HILL RD	5
	Jack Hill Rd	3		LIGHTENING RIDGE RD	1
	Kent Hill Rd	1		LUCE RD	3
	Ledge Hill Rd	1		MARSHFIELD RD	1
	Leonard Rd	1		MAX GRAY RD	2
	Lightening Ridge Rd	3		MOSCOW WOODS RD	3
	Luce Rd	4		N CALAIS RD	3
	Marshfield Rd	2		NO 10 POND RD	1
	Martin Rd	1		OLD WEST CHURCH RD	1
	Moscow Woods Rd	5		PECK HILL RD	1
	N Calais Rd	2		PEKIN BROOK RD	2
	Nelson Pond Rd	2		QUARRY RD	1
	NO 10 Pond Rd	3		ROBINSON CEMETERY RD	2
	Peck Hill Rd	2		ROBINSON HILL RD	1
	Pekin Brook Rd	5		SINGLETON RD	1
	Robinson Hill Rd	1		SODOM POND RD	1
	Singleton Rd	1		TUCKER RD	5
	Toby Hill Rd	1		W COUNTY RD	2
	W County Rd	6		WHEELER RD	4
	Worcester Rd	4		WORCESTER RD	7

Culverts with High Erosion

Source: VTrans Culvert Inventory

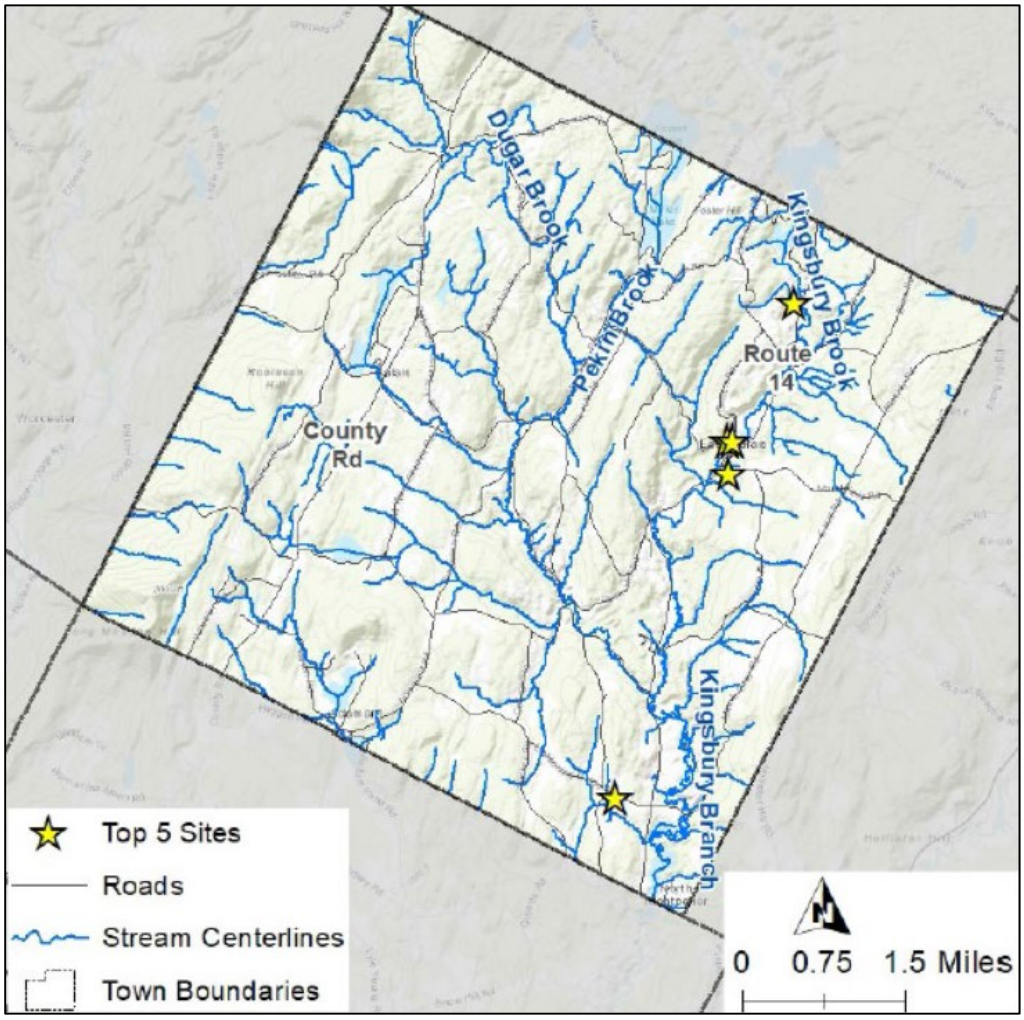
Road	#
DUGAR BROOK RD	2
KENT HILL RD	2
PEKIN BROOK RD	1
ROBINSON HILL RD	2
WHEELER RD	3
WORCESTER RD	2

2019 Kingsbury Branch Stormwater Master Plan: 20 Highest Ranking Sites

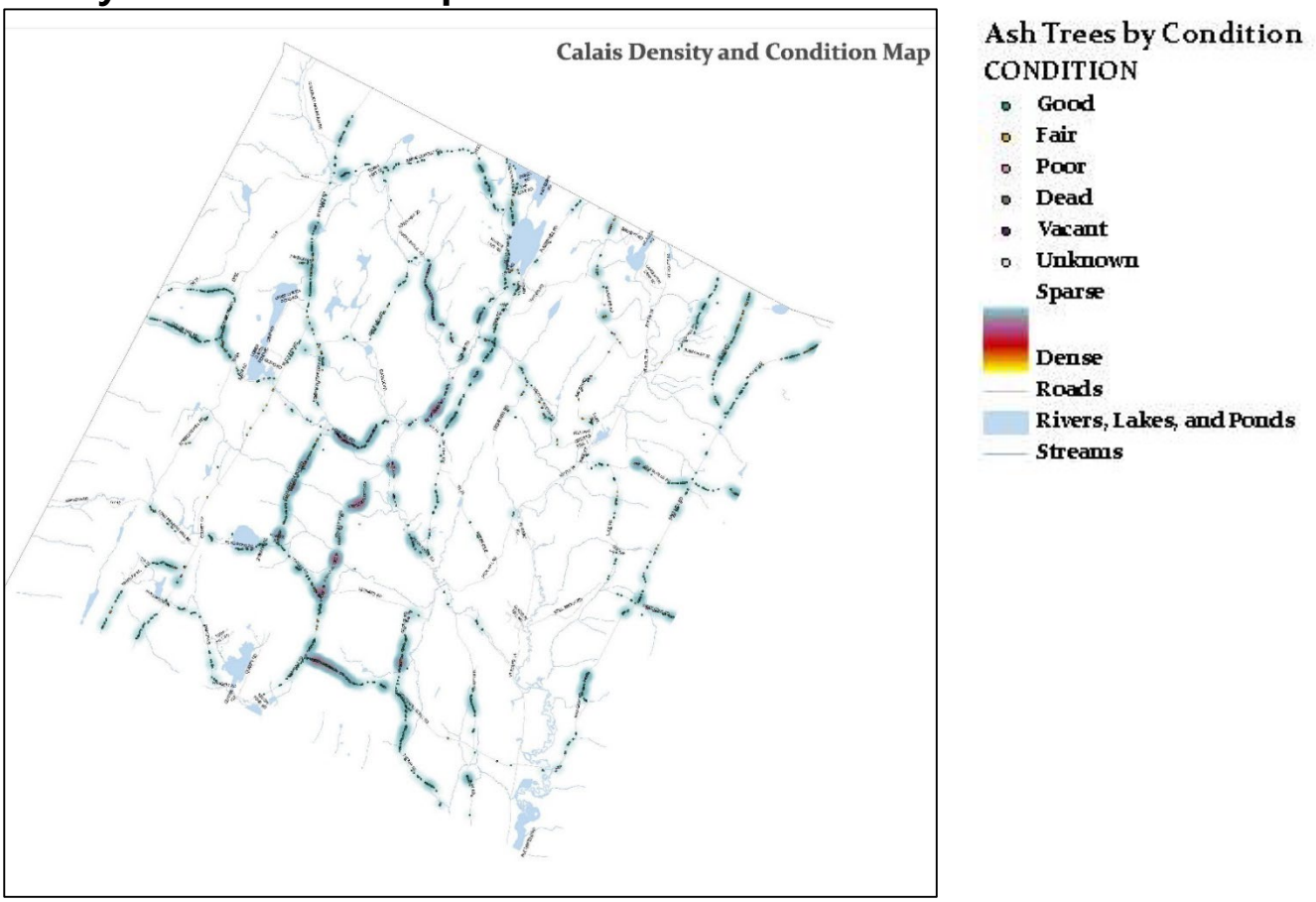
Rank	Site ID	Address	Proposed Practice Type
1	Calais Post Office	12 Batten Rd, Calais, VT	Underground Storage / Infiltration, Ditch / Swale Improvements
2	Moscow Woods Gully	101-121 Moscow Woods Rd, Calais, VT	Gully Stabilization, Infiltration Basin, Ditch / Swale Improvements
3	Marshfield Rd	Marshfield Rd, Calais, VT	Ditch / Swale Improvements, Check Dams, Gully Stabilization
4	Calais Town Garage	6011 VT-14, Calais, VT	Infiltration Basin, Check Dams, Salt Management
5	Calais Elementary School	321 Lightening Ridge Rd, Calais, VT	Bioretention, Sand Filter
6	Franks Farm	398 Lightening Ridge Rd, Calais, VT	Filter Strip / Buffer Enhancement, Cistern, Sand Filter, Cow Management
7	Calais Rt 14 Infiltration	4513 VT Route 14, Calais, VT	Dry Wells, Underground Storage / Infiltration
8	Route 14 Infiltration	4662 VT Route 14, Calais, VT	Underground Storage / Infiltration
9	Blachly Rd and Bliss Rd	3146-3156 E Hill Rd, Calais, VT	Check Dams, Ditch / Swale Improvements, Turnouts, Sediment Trap
10	Calais Town Clerk	3120 Pekin Brook Rd, Calais, VT	Bioretention, Ditch / Swale Improvements
11	Pekin Brook Rd and Kent Hill Buffer	3109 Pekin Brook Rd, Calais, VT	Filter Strip / Buffer Enhancement
12	Bliss Pond Rd	731-267 Bliss Pond Rd, Calais, VT	Filter Strip / Buffer Enhancement, Ditch / Swale Improvements, Bioretention
13	Adamant Rd and Haggett Rd	1313 Haggett Rd, Calais, VT	Filter Strip / Buffer Enhancement, Bioretention
14	N Calais Rd	2-24 N Calais Rd, Calais, VT	Ditch / Swale Improvements, Check Dams, Filter Strip / Buffer Enhancement
15	George Rd N	George Rd, Calais, VT	Ditch / Swale Improvements, Check Dams, Filter Strip / Buffer Enhancement
16	Maple Corner Store	31 W County Rd, Calais, VT	Stormwater Planter, Sand Filter, Bioretention, Filter Strip / Buffer Enhancement
17	Mirror Lake Access Point	150 Nelson Pond Rd, Calais, VT	Filter Strip / Buffer Enhancement, Bioretention
18	Memorial Hall	207 Gar Rd, Calais, VT	Filter Strip / Buffer Enhancement, Bioretention
19	Marshfield Rd & Church	4406–4498 VT Route 14, Calais, VT	Bioretention
20	Peck Hill Rd S	1206-1386 Peck Hill Rd, Calais, VT	Ditch / Swale Improvements, Regrade Road

2019 Kingsbury Branch Stormwater Master Plan: 5 Highest Ranking Sites

Rank	Site ID	Address	Proposed Practice Type
1	Calais Post Office	12 Batten Rd, Calais, VT	Underground Storage / Infiltration, Ditch / Swale Improvements
2	Moscow Woods Gully	101-121 Moscow Woods Rd, Calais, VT	Gully Stabilization, Infiltration Basin, Ditch / Swale Improvements
3	Marshfield Rd	Marshfield Rd, Calais, VT	Ditch / Swale Improvements, Check Dams, Gully Stabilization
4	Calais Town Garage	6011 VT-14, Calais, VT	Infiltration Basin, Check Dams, Salt Management
5	Calais Elementary School	321 Lightening Ridge Rd, Calais, VT	Bioretention, Sand Filter



2019 Ash Tree Management Plan
Density and Condition Map



Ash Trees in Dead/Poor Condition in Calais

Condition	Road	#
Dead (41 total)	Balentine Rd	1
	Bliss Pond Rd	1
	Bliss Rd	1
	County Rd	2
	Dugar Brook Rd	10
	George Rd	1
	Lightening Ridge Rd	5
	Long Meadow Hill Rd	1
	Max Gray Rd	4
	Moscow Woods Rd	1
	N Calais Rd	8
	NO 10 Pond Rd	1
	Old West Church Rd	1
	Pekin Brook Rd	1
	Robinson Cemetary	1
	Wheeler Rd	1
	Worcester Rd	1
	Adamant Rd	5

Condition	Road	#
Poor (307 total)	Apple Hill Rd	1
	Batten Rd	2
	Bayne Comolli Rd	6
	Blachly Rd	3
	Bliss Pond Rd	1
	Bliss Rd	1
	Collar Hill Rd	3
	County Rd	1
	Dugar Brook Rd	48
	East Hill Rd	7
	Fowler Rd	4
	George Rd	24
	Gray Rd	2
	Jack Hill Rd	1
	Kent Hill Rd	73
	Marshfield Rd	1
	Max Gray Rd	8
	Moscow Woods Rd	5
	N Calais Rd	85
	Nelson Pond Rd	1
	No 10 Pond Rd	6
	Old West Church Rd	6
	Pekin Brook Rd	1
	Robinson Cemetary	1
	Sadie Foss Rd	7
	TH 34	1
	Upper Rd	1
	West County Rd	7
	Wheeler Rd	1
	Worcester Rd	3

List of Dry Hydrants in Calais as of May 2020

East Montpelier				
Name	*Location*	*Notes*	*Maintenance Date*	*Maintain by (Signature)*
E.E Packard	Packard Dr	Business takes care of		
Gene Troia	Vincent Flats Rd	Not used		
Snake Pond *	Center Rd		5/7/20	TT, PG
Templeton *	Templeton Rd		5/7/20	TT, PG
Horn of the Moon *	Horn or the Moon before Jacobs Rd		5/26/20	TT, PG, AB
Sparrow Farm Rd *	Sparrow Farm Rd	In wooden structure		
North Montpelier Pond *	Factory St	First right on Factory St.	5/28/20	TT, PG, AB
County Rd	1693 County Rd	homeowner	5/26/20	TT, PG, AB
Northwood Apts	Northwood Rd	homeowner	5/24/20	Flowed at brush fire
Messier	East Hill Rd	homeowner		
Clark Rd *	Clark Rd By Nutbrowns Residence	Left off East Hill Rd.	5/28/20	TT, PG, AB
Codling Rd	Codling Rd by Rt 2		5/6/20	TT, PG

Calais			
Name	*Location*	*Maintenance Date*	*Maintain by (Signature)*
Leonard Road	Intersection with Singleton Rd	5/26/20	TT, PG, AB
Curtis Pond (Maple Corners)	Maple Corners, Camp Rd.	5/26/20	TT, PG, AB
Mill Pond	Mill Rd off Moscow Woods Rd	5/28/20	TT, PG, AB
East Hill Rd	Left off Marshfield Rd	5/28/20	TT, PG, AB
East Hill Rd by Sadie Foss	Across from 187 East Hill road	5/28/20	TT, PG, AB
Peck Hill	Peck Hill Rd on Pekin Brook Side	Will ask Woodbury FD to test	
Max Gray Rd.	By single lane bridge	5/26/20	TT, PG, AB

Milone & MacBroom Pekin Brook Floodplain Mapping and Calais Town Hall Alternatives Analysis: Preferred Alternative

Alternative 4 consists of elevating the building in place and installing floodproofing rather than placing fill in the floodplain. Although the portion of the building below the base flood elevation would be resistant to flooding, the building could potentially be surrounded by water limiting access should the base flood occur.

PROS	CONS
• Reduces flood vulnerability	• No change to sediment and wood transport
• No floodplain fill and thus limited impacts	• Roadway overtopping continues
• Simple permitting	• Erosion hazards remain
	• Building potentially surrounded by water during base flood

Alternative 5 consists of elevating the building in place on approximately 2 feet of floodplain fill, installing floodproofing, and increasing the size of both culverts. This alternative combines the proposed conditions of Alternatives 2B, 3B, and 4 and collectively maximize reductions in flood and erosion vulnerability. The existing Pekin Brook culvert (12 feet wide by 8 feet tall) would be reused as the replacement structure at the Elmslie Brook crossing. As part of the building renovation, the new foundation would be designed using standard floodproofing techniques.

PROS	CONS
• Reduces flood vulnerability the most	• May require compensatory flood storage to offset limited fill
• Reduces erosion vulnerability	
• Minimizes floodplain fill	
• Roadway does not overtop during base flood	
• Improves sediment and wood transport	
• Simple permitting	

4.3 The Preferred Alternative

The preferred alternative is to increase the size of the Pekin Brook culvert to the channel bankfull width of 22 feet, to swap the existing Pekin Brook culvert to Elmslie Brook, to elevate the building approximately 2 feet of fill, and to floodproof the lower part of the building up to 2 feet over the proposed base flood elevation. The proposed base flood elevation assuming the preferred alternative is implemented would be 759.2 (feet NAVD88) (Appendix B). Therefore, in order to provide 2 feet of freeboard, the building should be floodproofed up to elevation 761.2 (feet NAVD88). The existing conditions floodplain delineation assuming clear flow has been modified to reflect implementation of the preferred alternative (Figure 3).

Calais 4/26/21 Selectboard Agenda

TOWN OF CALAIS

3120 Pekin Brook Road
East Calais, Vermont 05650
802-456-8720

Selectboard Meeting Agenda

Monday, April 26, 2021 at 7:00 pm

VIA: ZOOM (see details below)*

PLEASE NOTE: Except for the start time, all agenda times are guidelines only and are subject to change without notice.

7:00 pm • Call to Order
• Public Comment (for items not on agenda)
• Additions/Changes to Agenda

7:05 pm • Delegation of evaluation to purchase used 2014 Western Star truck

7:15 pm • Update from Town Constable and Animal Control Officer

7:45 pm • Presentation and review of updated draft Local Hazard Mitigation Plan (Grace Vinson, CVRPC)

8:10 pm • Consideration of website group request for assistance

8:15 pm • Annual discussion regarding IT services with rBTech

8:35 pm • Approve expense to purchase new computer for Recording Secretary

8:40 pm • Town Hall
• Friends of Town Hall – request for letter of support from Selectboard to apply for Cultural Facilities Grant
• Consideration of purchase of water filtration system for Town Hall
• Executive Session (as needed) per 1 V.S.A. § 313(a) and personnel matters (schedule special meeting)

- Review and approve minutes
- Review future agenda items and schedule special meeting
- Other business/old business/new business
- Adjourn

Future Agenda Items

2014 Western Star info
Review Treasurer's Report (5/10/2021)
Continuation of appointments/reappointments (5/10/2021)
Curtis Pond Dam Exploratory Group – next steps (5/10/2021)
Sign Dog Warrant for delinquent dog licenses (5/10/2021)
Approve updated LEMP (must do on 5/10/2021)
Consideration and approval of NCMHA Interim Mngmt. Plan and release of CC funds (Stephanie Kaplan/Rowan Jacobson 5/10/2021)
Peter Harvey request for permission to post "Do Not Mow" Wild Chervil signs on Fowler Rd, Bliss Pond Rd, Old West Church Rd, and Sparrow Rd and have the road crew delay roadside mowing on until late fall as they did last year on these 4 roads while I am identifying, digging, and documenting Wild Chervil plants on these roads. (5/10/2021?)
Covid - discuss plan for reopening Town bldgs.
County Rd. speed limit reduction
Discuss process to review and update various Town Policies and Ordinances
TH #7 discontinuance (Gary Schultz)
Update WEC and CVFiber (Barry Bernstein/David Healy)
East Calais Stormwater Treatment Design Report and Plans need land owner easements (Pam DeAndrea)
Adopt revised LHMP (7/26/2021 agenda – Grace Vison)
Ordinance for junk
WVFD building
Capital West Dispatching
ARPA funds
Vtrans Rte. 14 bridge project

NOTE: In order to be admitted to the meeting via your computer, you will need to sign in using your full name so we have a record of who was in attendance for our minutes.

Topic: Calais Selectboard Meeting
Time: Apr 26, 2021 07:00 PM Eastern Time (US and Canada)

Join Zoom Meeting
https://us02web.zoom.us/j/81691005490?pwd=aVQ1dXRmbjdYUG9KSHFMaGFjVUxzdz09

Meeting ID: 816 9100 5490
Passcode: 957632
One tap mobile
+19292056099,,81691005490#,,,,*957632# US (New York)
+13017158592,,81691005490#,,,,*957632# US (Washington DC)

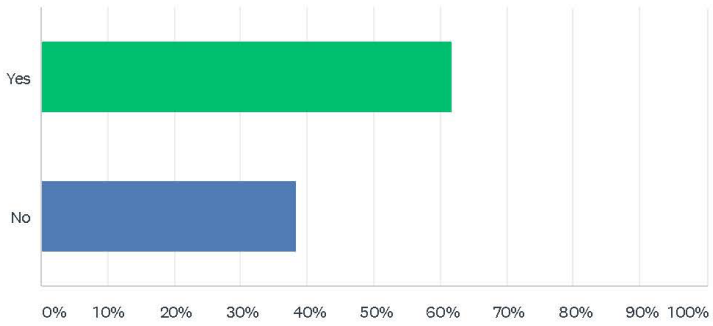
Dial by your location
+1 929 205 6099 US (New York)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)
+1 669 900 6833 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
Meeting ID: 816 9100 5490
Passcode: 957632
Find your local number: https://us02web.zoom.us/u/ketfPj65HU

http://www.calaisvermont.gov/

Survey Results

Q1 Have you ever been impacted by a natural disaster in Central Vermont?

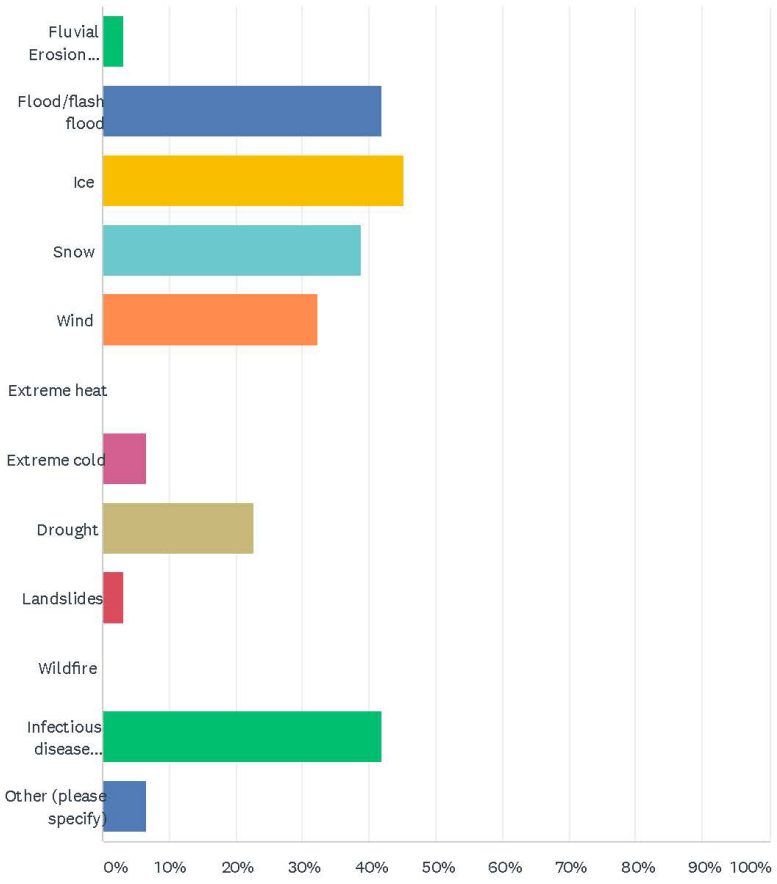
Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	61.76%	21
No	38.24%	13
TOTAL		34

Q2 Which of the following hazards has impacted you the most? (Check all that apply)

Answered: 31 Skipped: 4

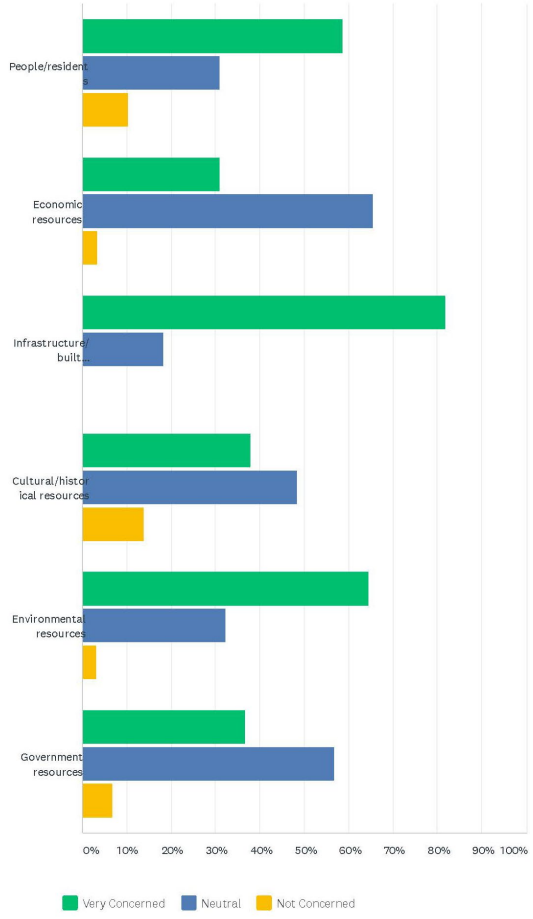


Calais LHMP Survey

ANSWER CHOICES	RESPONSES	
Fluvial Erosion (streambed and streambank erosion associated with physical adjustments of width and depth of stream channel)	3.23%	1
Flood/flash flood	41.94%	13
Ice	45.16%	14
Snow	38.71%	12
Wind	32.26%	10
Extreme heat	0.00%	0
Extreme cold	6.45%	2
Drought	22.58%	7
Landslides	3.23%	1
Wildfire	0.00%	0
Infectious disease (including COVID-19)	41.94%	13
Other (please specify)	6.45%	2
Total Respondents: 31		

Q3 In terms of vulnerability to the hazards listed above, how concerned are you about the following?

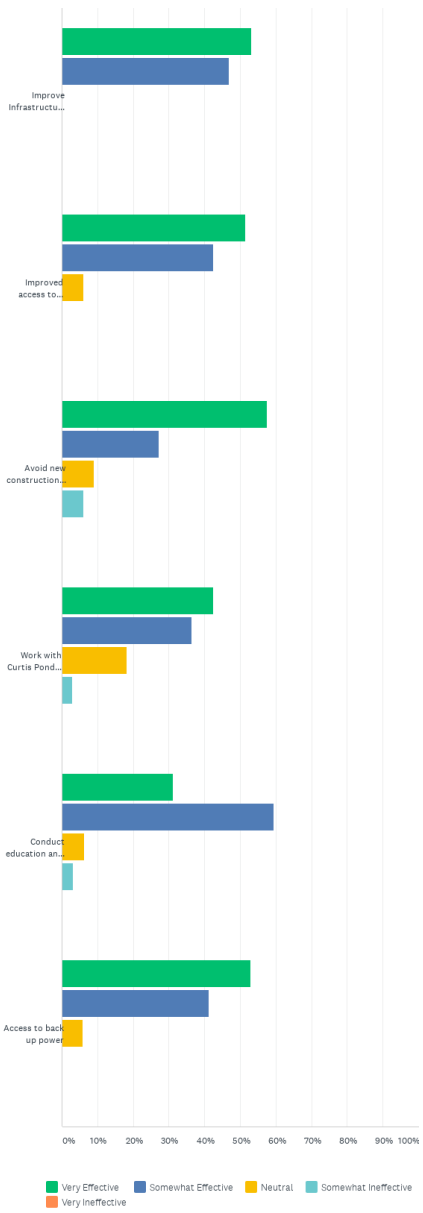
Answered: 33 Skipped: 2



	VERY CONCERNED	NEUTRAL	NOT CONCERNED	TOTAL
People/residents	58.62% 17	31.03% 9	10.34% 3	29
Economic resources	31.03% 9	65.52% 19	3.45% 1	29
Infrastructure/built environment (roads, bridges, culverts, public facilities)	81.82% 27	18.18% 6	0.00% 0	33
Cultural/historical resources	37.93% 11	48.28% 14	13.79% 4	29
Environmental resources	64.52% 20	32.26% 10	3.23% 1	31
Government resources	36.67% 11	56.67% 17	6.67% 2	30

Q4 How effective would the following actions be in reducing or eliminating the risk of future damages?

Answered: 35 Skipped: 0

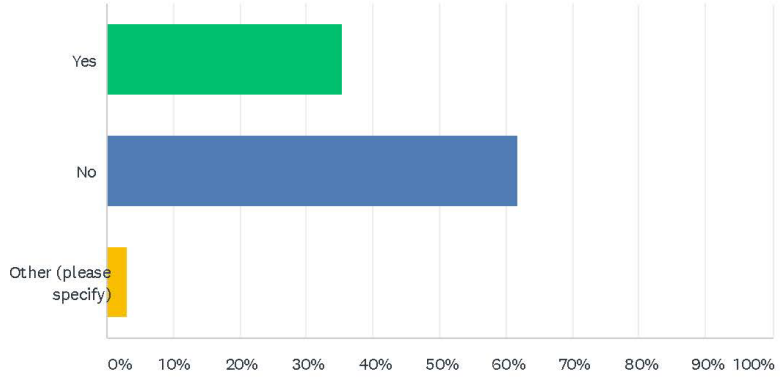


Calais LHMP Survey

	VERY EFFECTIVE	SOMEWHAT EFFECTIVE	NEUTRAL	SOMEWHAT INEFFECTIVE	VERY INEFFECTIVE	TOTAL	WEIGHTED AVERAGE
Improve Infrastructure (roads, bridges, culverts, public facilities)	53.13% 17	46.88% 15	0.00% 0	0.00% 0	0.00% 0	32	1.47
Improved access to broadband	51.52% 17	42.42% 14	6.06% 2	0.00% 0	0.00% 0	33	1.55
Avoid new construction in areas subject to flooding and/or erosion	57.58% 19	27.27% 9	9.09% 3	6.06% 2	0.00% 0	33	1.64
Work with Curtis Pond Association to understand and prevent hazards	42.42% 14	36.36% 12	18.18% 6	3.03% 1	0.00% 0	33	1.82
Conduct education and awareness programs	31.25% 10	59.38% 19	6.25% 2	3.13% 1	0.00% 0	32	1.81
Access to back up power	52.94% 18	41.18% 14	5.88% 2	0.00% 0	0.00% 0	34	1.53

Q5 Have you ever received information about how to make your home safer from natural disasters?

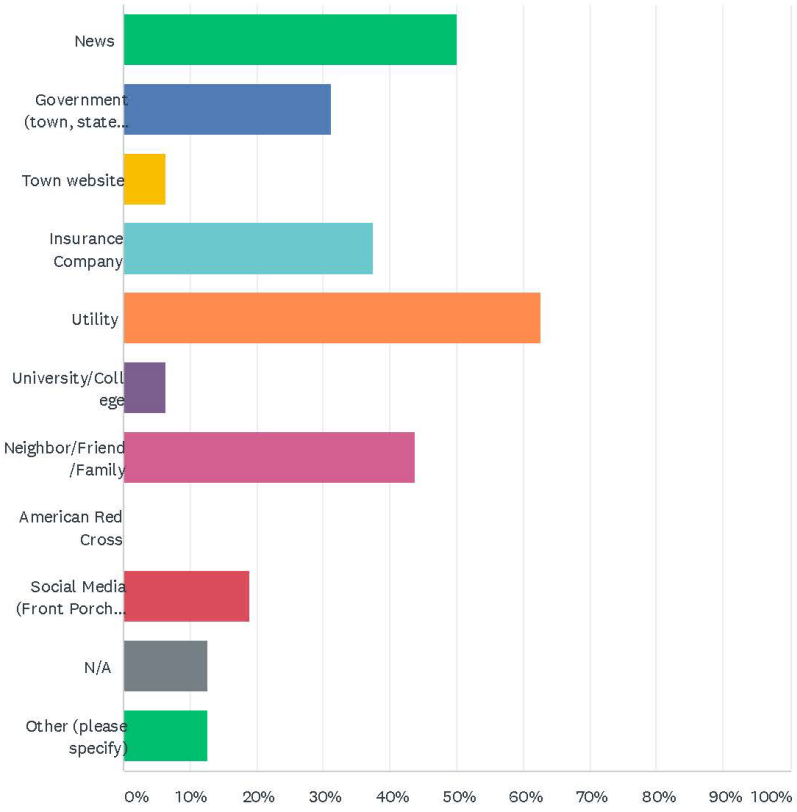
Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	35.29%	12
No	61.76%	21
Other (please specify)	2.94%	1
TOTAL		34

Q6 If so, from what source (check all that apply)

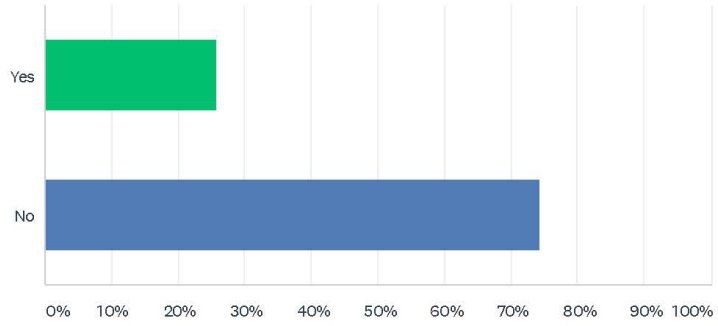
Answered: 16 Skipped: 19



ANSWER CHOICES	RESPONSES	
News	50.00%	8
Government (town, state, or federal)	31.25%	5
Town website	6.25%	1
Insurance Company	37.50%	6
Utility	62.50%	10
University/College	6.25%	1
Neighbor/Friend/Family	43.75%	7
American Red Cross	0.00%	0
Social Media (Front Porch Forum, etc)	18.75%	3
N/A	12.50%	2
Other (please specify)	12.50%	2
Total Respondents: 16		

Q7 Do you know the location of emergency shelters in Calais?

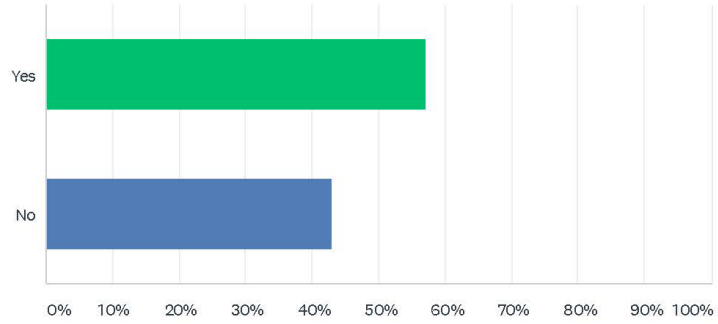
Answered: 35 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	25.71%	9
No	74.29%	26
TOTAL		35

Q8 Are you aware of VTAlert?

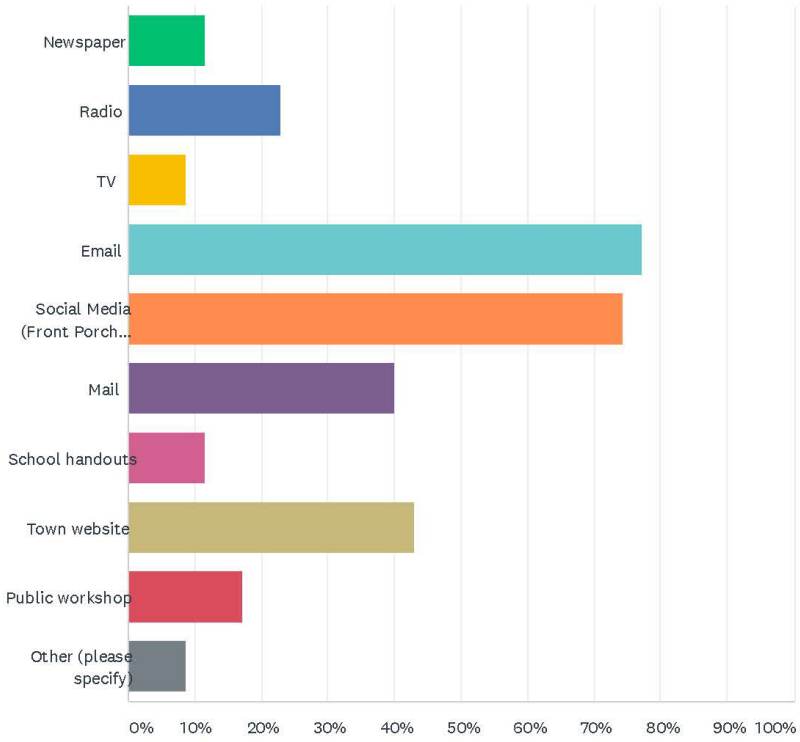
Answered: 35 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	57.14%	20
No	42.86%	15
TOTAL		35

Q10 What is the most effective way for you to receive information about making your home safer from natural disasters? (check all that apply)

Answered: 35 Skipped: 0



ANSWER CHOICES	RESPONSES	
Newspaper	11.43%	4
Radio	22.86%	8
TV	8.57%	3
Email	77.14%	27
Social Media (Front Porch Forum, Facebook, etc)	74.29%	26
Mail	40.00%	14
School handouts	11.43%	4
Town website	42.86%	15
Public workshop	17.14%	6
Other (please specify)	8.57%	3
Total Respondents: 35		

Q11 Please provide any additional information that you feel will be beneficial in the drafting of our hazard mitigation plan (short answer)

Helpful for residents to know basic info on who to contact, what to do and where to go in case of emergency. Maybe at Town Meeting that could be a discussion topic. Also letting individuals know how they personally can make a difference whether it is identifying neighbors who need special assistance, changing individual behavior/habits so that there are fewer environmental impacts, "adopting" a building/area in town to be "responsible" for. Great project to do with kids . . .
Besides improving public infrastructure, how can the plan provide resources to homeowners to help them become more individually resilient in the face of disasters? Food and water storage, first aid supplies, backup electricity generation, etc.?
The town of Calais should actively support the repair of Curtis Pond Dam.
We have flooding from road culvert eroding our bank and flooding our driveway.
Flat lowland E of Maple Corner on Kent Hill Rd - find way to eliminate beaver hazard which regularly causes rd. to flood (late winter/spring, mud season) making rd. not drivable.
Everyone in "a Town" should know where the shelters are.

5-Year Plan Review/Maintenance Process

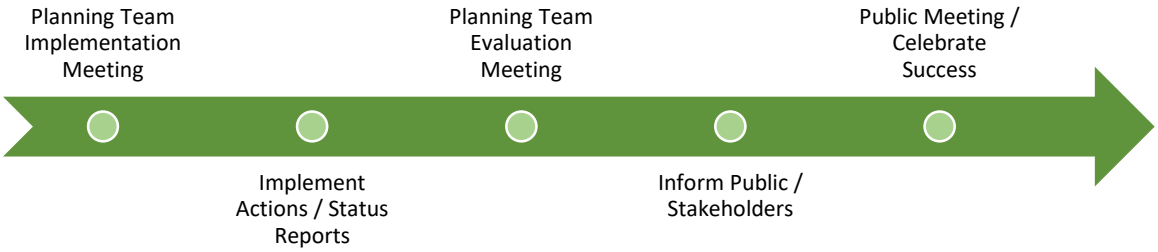
- Brief local leadership on plan approval
- Formally adopt plan
- Publicize plan approval and adoption
- Celebrate success

- Confirm/clarify responsibilities
- Integrate mitigation actions
- Monitor and document implementation of projects and actions
- Establish indicator of effectiveness or success

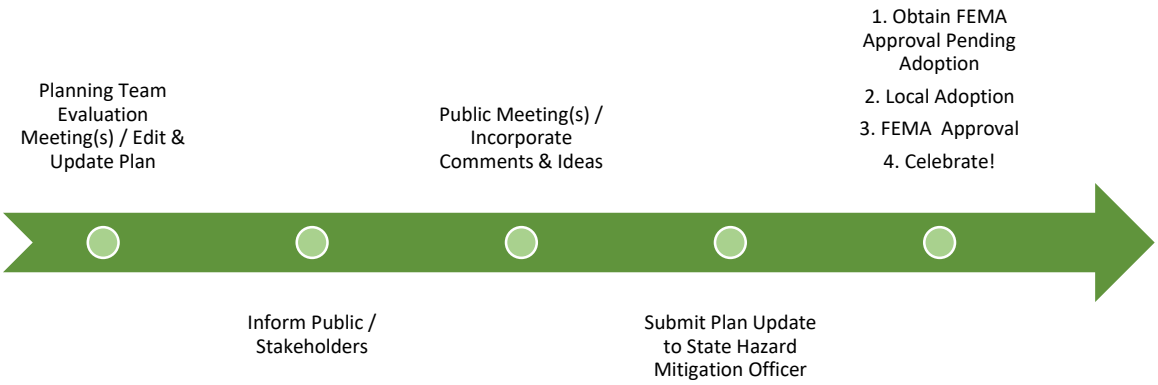
- Effectiveness of planning process
- Effectiveness of actions
- Document success & challenges of actions
- Update and involve community
- Celebrate successes

- Review factors affecting community's context
- Analyze findings; determine whether to revise process or strategy
- Incorporate findings into the plan

After Plan Adoption – Annually Implement and Evaluate



Fifth Year, and After Major Disaster - Evaluate and Revise



Certificate of Adoption

CERTIFICATE OF ADOPTION
MONTH DAY, 2021 9/27/2021
Town of Calais, Vermont Selectboard

A resolution adopting the Town of Calais, Vermont 2021 Local Hazard Mitigation Plan

WHEREAS, the Town of Calais has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the 2021 Calais, Vermont Local Hazard Mitigation Plan, which result in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Calais has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its 2021 Calais, Vermont Local Hazard Mitigation Plan (Plan) under the requirements of 44 CFR 201.6; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies, and Plan maintenance procedures for the Town of Calais; and

WHEREAS, the Plan recommends several hazard mitigation actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Calais with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the Town of Calais eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by Town of Calais Selectboard:

1. The 2021 Calais, Vermont Local Hazard Mitigation Plan is hereby adopted as an official plan of the Town of Calais;

2. The respective officials identified in the mitigation action plan of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;

3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution; and

4. An annual report on the process of the implementation elements of the Plan will be presented to the Selectboard by the Emergency Management Director or Coordinator.

IN WITHNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Calais on this DAY of MONTH 2021.

27 of September 2021

Denise Wheeler, Chair
Calais Selectboard

Denise Wheeler, Chair

ATTEST

Calais Town Clerk

oct 4, 2021

U.S. Department of Homeland Security
FEMA Region I
99 High Street, Sixth Floor
Boston, MA 02110-2132

FEMA

October 13, 2021

Stephanie A. Smith, State Hazard Mitigation Officer
Vermont Emergency Management
45 State Drive
Waterbury, Vermont 05671-1300

Dear Ms. Smith:

As outlined in the FEMA-State Agreement for FEMA-DR-4474, your office has been delegated the authority to review and approve local mitigation plans under the Program Administration by States Pilot Program. Our Agency has been notified that your office completed its review of the Town of Calais, VT Local Hazard Mitigation Plan and approved it effective **October 8, 2021** through **October 7, 2026** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the National Flood Insurance Act of 1968, as amended, and Title 44 Code of Federal Regulations (CFR) Part 201.

With this plan approval, the jurisdiction is eligible to apply to Vermont Emergency Management for mitigation grants administered by FEMA. Requests for funding will be evaluated according to the eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in this community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

The plan must be updated and resubmitted to the FEMA Region I Mitigation Division for approval every five years to remain eligible for FEMA mitigation grant funding.

Thank you for your continued commitment and dedication to risk reduction demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Jay Neiderbach at (617) 832-4926 or Josiah.Neiderbach@fema.dhs.gov.

Sincerely,

Paul F. Ford
Acting Regional Administrator
DHS, FEMA Region I

PFF:jn

cc: Ben Rose, Recovery and Mitigation Section Chief, VEM