

# Craftsbury Local Hazard Mitigation Plan

ADOPTED OCTOBER 18, 2022

CERTIFICATE OF LOCAL ADOPTION

Town of Craftsbury, Vermont

A Resolution Adopting the Local Hazard Mitigation Plan

WHEREAS, the Town of Craftsbury has worked with its residents and stakeholders to identify its hazards and vulnerabilities, analyze past and potential future losses due to natural and human-caused hazards, and identify strategies for mitigating future losses; and ...

WHEREAS, the Town of Craftsbury Local Hazard Mitigation Plan contains recommendations, potential actions and future projects to mitigate damage from disasters in Craftsbury; and

WHEREAS, the Town of Craftsbury and the respective officials will pursue implementation of the strategy and follow the maintenance process described in this plan to assure that the plan stays up to date and compliant; and...

WHEREAS, a meeting was held by the Town of Craftsbury Selectboard to formally approve and adopt the Craftsbury Local Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Town of Craftsbury Selectboard adopts this Local Hazard Mitigation Plan for the town.

10/18/2022

Date

Bruce Urie

Bruce Urie, Co-chair

Jim Jones

Jim Jones, Co-chair

Susan Houston

Susan Houston

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# 1. INTRODUCTION

## A. Purpose

The purpose of this plan is to assist Craftsbury in identifying hazards facing the town and to identify mitigation strategies to begin reducing their risks. It is less costly to reduce vulnerability to disasters than to repeatedly repair damage.

**Hazard Mitigation: Any sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects.**

**-- Vermont 2018 State Hazard Mitigation Plan**

Hazard mitigation strategies 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, avoid the hazard by stopping or limiting development, or reducing the potential impact through education and outreach. Specific hazard mitigation projects include:

- Flood-proofing structures
- Securing propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters in flood-prone areas
- Identifying and modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Proactive land use planning for floodplains and other flood-prone areas
- Proper road maintenance and construction
- Ensuring critical facilities are safely located
- Providing public information

With enhanced emphasis on community resilience, many state agencies and local organizations have an increased awareness of the importance of mitigation planning and have produced plans and resources that towns can use to support their planning efforts. This plan will reference, when relevant, pertinent tools and resources that can be used to enhance mitigation strategies.

[\*The Code of Federal Regulations \(44 CFR Part 201\)\*](#), establishes criteria for State and local hazard mitigation planning authorized by Section 322 of the Stafford Act as amended by Section 104 of the *Disaster Mitigation Act of 2000*. Effective November 1, 2003, local governments must have an approved local hazard mitigation plan prior to the approval of a local mitigation project funded through federal Pre-Disaster Mitigation funds. Furthermore, the State of Vermont is required to adopt a State Pre-Disaster Mitigation Plan for Pre-Disaster Mitigation funds or grants to be released for either a state or local mitigation project after November 1, 2004.

There are several implications if the plan is not adopted and approved by FEMA:

- After November 1, 2004, [Flood Mitigation Assistance Grant Program \(FMAGP\)](#) funds will be available only to communities that have adopted a local plan;
- Communities without a plan are not eligible to receive funding from [FEMA's Hazard Mitigation Grant Program \(HMGP\)](#) to pay for hazard mitigation projects. (Communities, however, may apply for planning grants under the 7% of HMGP available for planning;

- Communities with a local plan are not eligible to funding from [FEMA's Pre-Disaster Mitigation \(PDM\)](#) program, and
- For disasters declared after October 14th, 2014, a community without a plan will be required to meet a greater state match when public assistance is awarded under the Emergency Relief Assistance Fund (ERAF) requirements.

Adoption and maintenance of this Hazard Mitigation Plan will:

- Make certain funding sources available to complete the identified mitigation initiatives that would not otherwise be available if the plan were not in place;
- Support effective pre- and post-disaster decision making efforts;
- Lessen each local government's vulnerability to disasters by focusing limited financial resources to specifically identified initiatives whose importance have been ranked; and
- Connect hazard mitigation planning to community planning where possible.

## B. Planning Process

### Review Working Group

The committee responsible for overseeing the plan update process represents a cross section of local stakeholders whose expertise was essential to the development of the mitigation plan. Collectively, this group possesses a first-hand knowledge of natural hazards and how they affect the community. Committee members were also able to develop, evaluate, and prioritize mitigation actions that will counteract the effects of these hazards.

- **Penelope Doherty**, Supervisor on the Lamoille Solid Waste District Board Craftsbury Community Care Board, Eligo Lake Association Director, and Vice Chair of Craftsbury Neighbor to Neighbor, an official town task force responsible for aiding and supporting the community during times of distress. She has a background in crisis and disaster planning and response, stakeholder engagement, regulatory analysis and compliance, and community development
- **Brian Machesney**, Secretary of Conservation Commission, and appointed alternate to NEK Communications Union District. He has a background in communications and logistical support
- **Gordon Waterhouse**, Floodplain Administrator for Craftsbury's floodplain regulations and member of the Planning Commission
- **Kris Coville**, chair of Craftsbury's Neighbor to Neighbor, member of Craftsbury Recreation Committee, and Manager of the Craftsbury Food Share
- **Linda Ramsdell**, Secretary of the Craftsbury Planning Commission
- **Steve Perkins**, Assistant Fire Chief for Craftsbury Fire Department, employee of the Craftsbury Road Department

Working group members attended planning meetings but also made themselves available to provide information on request by the regional planning commission and reached out to other town officials as needed. They reviewed drafts of plans and data and liaised with the Selectboard.

### Regional Planning Commission

Multiple individuals from this organization were involved. A Senior Planner from Northeastern Vermont Development Association (NVDA) worked directly with the review working group, attended

meetings, and was responsible for plan drafts and research. She was assisted by NVDA’s GIS Specialist, who compiled and mapped hazard data.

### Public Involvement

Public involvement consisted of a public survey and two public meetings. See Table 1.1. Survey and meetings were both highly publicized through multiple channels, including direct mail to all local postal customers.

### Neighboring Communities and Relevant Agencies

Front Porch Forum notices during the plan development were distributed to general audiences in neighboring communities. Following the release of the first draft by the Craftsbury Selectboard, the plan was made available from the Town’s website, and information was shared with the town clerks and planning commission chairs of neighboring communities. Drafts were also shared with the Vermont Department of Health and Vermont Agency of Natural Resources, Department of Environmental Conservation.

*Table 1B.1: Chronology of Planning Process*

Date(s)	Description
3/1/2022, and 3/15/2022	Hazard Mitigation working group members met to review data, review requirements for VEM/FEMA approval, hazards profiled in Vermont’s 2018 Hazard Mitigation Plan, as well as hazards profiled in the expired Craftsbury plan from 2005. A member of the group developed a live ranking process for risks. Members also discussed public outreach methods, potential dates for public meetings, and potential strategies for reviewing and updating plan once adopted and approved by FEMA.
3/22/2022	Hazard mitigation working group met with Alison Low of NVDA to identify hazards for ranking. The group identified the vulnerabilities of each hazard and assigned scores using the ranking table.
3/29/2022	Hazard Mitigation working group met with Alison to work on draft of Community Hazard Mitigation survey and discuss strategies for distributing it.
4/5/2022	Penelope Doherty and Brian Machesney met with the Selectboard (a regularly warned public meeting of the selectboard) to bring the board up to date on efforts. Discussed in the public meeting were including preliminary hazard rankings, proposed survey to community, and proposed outreach plan. Selectboard approved public outreach plans, including funds to pay for survey printing and distribution. Second public meeting was set for 5/24/2022.
4/12/2022	Community survey went live. Survey was available online and on paper. A postcard was sent to every resident using Every Door Direct. The mailing told citizens where to find the survey and informed the public of the follow-up public meeting on May 24 <sup>th</sup> . The survey was also publicized through announcements on Front Porch Forum, the Town Website, and the Town Facebook page. This information included a URL to the survey. Paper copies were made available at the Town Hall, Post Office, libraries, and at both general stores, with collection boxes. Clipboard volunteers staffed the food pantry drive-through (4/21/2022 and 4/28/2022) and transfer station (4/23/2022 and 4/28/2022) for two consecutive weeks.
4/13/2022, 4/27/2022, and 5/4/2022	Working group met with Alison to review potential mitigation actions. The group reviewed a STAPLE+E process to evaluate and prioritize mitigation strategies. Individual members completed the rankings and then compared responses in subsequent meetings. Final rankings were based on the consensus of the steering committee.
5/17/2022	Members of the working group presented a preliminary information packet to the Selectboard (at a regularly warned Selectboard meeting) in advance of the 5/24 meeting. Information consisted of initial summary profiles of hazards, a summary of survey responses, a full slate of proposed mitigation strategies, and ranking scores for each strategy.



5/24/2022	Public meeting. Notice and agenda were posted in the usual places around town, posted on Front Porch Forum 5/20 and 5/23, and posted on the calendar on the Town’s website. A Zoom link was made available for remote attendees. In attendance were Jim Jones, Susan Houston, and Bruce Urie, Craftsbury Selectboard; Farley Brown, Planning Commission and Conservation Commission; Kevin Gregoire, Energy Committee; Michelle Warren, Town Clerk, and Alison Low, NVDA. Working group members in attendance were Steve Perkins, Linda Ramsdell, Penelope Doherty, Brian Machesney, and Kris Coville (Zoom). Additional Zoom attendees were Mabel Houghton and Elinor Osborn. Meeting materials includes summary hazard profiles, proposed mitigation strategies, and strategy ranking data. These materials, as well as PowerPoint slides used in the meeting were made available from the Town Web site after the meeting. No changes to the mitigation strategies were proposed.
06/17/22 – 08/15/2022	Final draft sections of the plan were given to members of the working group, who provided feedback and subsequently reviewed and discussed drafts with the Selectboard. Drafts were shared with the Agency of Natural Resources and the NVDA Basin Planner. Comments received from ANR and the Basin planner pertained to the pending release of revised FEMA data and the need for review of river corridor data. (Both are reflected in the mitigation strategies.) Technical correction from the selectboard was made to note a second solar panel at the Town Garage site and update to the Town’s emergency dispatching arrangement.
08/16/2022-10/11/2022	Full final drafts of the plan were made available from the Town web site. The plan was also shared with neighboring communities. No comments were received from neighboring towns or from the general public.

#### Information Sources Reviewed

- Centers for Disease Control
- Federal Emergency Management Agency, Open FEMA Datasets  
<https://www.fema.gov/about/openfema/datasets#public>
- Feeding America
- National Weather Service, National Oceanic and Atmospheric Administration  
<https://www.noaa.gov/>
- NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published December 2021, retrieved on May 24, 2022 from <https://www.ncdc.noaa.gov/cag/>
- Craftsbury Town Plan, adopted June 14, 2016
- Craftsbury Flood Plain Regulations, adopted September 11, 2001
- Town of Craftsbury 2005 Local Hazard Mitigation Plan
- Town of Craftsbury Annual Reports, 2017-2021
- U.S. Drought Monitor, National Drought Mitigation Center, University of Nebraska-Lincoln
- University of Vermont, Vermont Climate Assessment (2021)  
<https://www.uvm.edu/news/gund/vermont-getting-warmer-and-wetter-climate-change-study>
- University of Vermont, Vermont State Indicators Online <https://www.uvm.edu/crs/vermont-indicators-online>
- US Census Bureau: 2020 Decennial Census and 2020 American Community Survey 5-Year Estimates
- Vermont Agency of Natural Resources
- Vermont Agency of Transportation, VTrans Town Highway Maps  
<https://vtrans.vermont.gov/content/planning/maps/town-maps/highway-maps>
- Vermont Center for Geographic Information <https://vcgi.vermont.gov/>

**This section of the plan satisfies requirement §201.6(b)(3): Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information?**

- Vermont Climate Action Plan <https://climatechange.vermont.gov/about>
- Vermont Department of Health, Climate and Health Resources <https://www.healthvermont.gov/environment/climate>
- Vermont Online Bridge and Culvert inventory (VOBCIT) <https://vtculverts.org/>
- Vermont State Hazard Mitigation Plan 2018 <https://vem.vermont.gov/plans/SHMP>

## C. Community Profile

### Town Background

The Town of Craftsbury is a small rural community in north-central Vermont, in an area known as “the Northeast Kingdom,” a tri-county region that covers approximately one-fifth of the state’s land mass yet only accounts for only about one-tenth of the state’s population. Craftsbury is comprised of 39.7 square miles, 39.3 of which are land, and 0.4 water. More than 75% of the town is forested, interspersed with scattered rural residential development and about 30 farming operations of varying scales. More than a quarter of the town’s acreage is conserved through public and private interests, such as the Vermont Land Trust, and more than half of the town’s farm and forest acreage is enrolled in Vermont’s Use Value Appraisal Program (aka “Current Use”), which tends to disincentivize development.

### Prevailing Development Trends

Craftsbury’s land development patterns consist of three villages (Craftsbury Village, Craftsbury Common, and East Craftsbury) and scattered low-density development. The villages are unincorporated, meaning that they exist by tradition, and they not governed separately from the municipality. Northeastern Vermont Development

**This section of the plan satisfies requirement §201.6(d)(3): Was the plan revised to reflect changes in development?**

Association (the regional planning commission) cites Craftsbury’s villages as a classic example of a traditional Vermont “Village Center,” which is typically characterized by some small-lot residential housing, and some community buildings as libraries, schools, civic uses, clubs, and churches. The balance of land in Craftsbury falls under the regional plan’s classification of “Rural Areas,” which according to NVDA’s land use plan, consist “mainly of the farms and forestlands of the traditional Vermont landscape.” The regional plan also states that “rural areas should receive very little commercial or industrial development unless it occurs in an established industrial park, or in an area specifically designated in the local zoning by law or identified in the Town Plan as being well suited to such uses.” Craftsbury has had no zoning since the early 1970s, when the town adopted a zoning ordinance and repealed it one year later. The town has enforced flood hazard regulations since 2001.

The Craftsbury Town Plan (2016) notes the following development patterns: About 10 new homes were constructed per year from 1993 to 2004. The Great Recession of 2008 brought about a significant decrease in building activity. From 2005 to 2011, there were 43 new homes built and 19 homes removed from the housing stock due to fires or removal of mobile homes.

The 2020 U.S. Census reports a total population of 1,343 residents, which represents an 11% jump from 2010. Craftsbury’s growth significantly outpaces county-wide growth rate over the same period. Historic decennial Census counts show a moderate to steady increase in the town’s population since 1970, following seven decades of population loss.

Despite the increase in population, Craftsbury continues to be, for all intents and purposes, a rural community with a prevailing long-term trend of scattered low-density residential development. Non-

residential development remains on a rural scale as well. Craftsbury has two general stores; several auto repair businesses; a funeral home; several landscaping and excavation business; a real estate office; artisan enterprises such as wool and pottery; personal services; and bed and breakfasts. Agriculture is an important economic driver and the town’s broad range of agricultural enterprises encompasses diversified production, dairy farming, organic production, blueberry farming, small ruminants, nurseries, Christmas trees, and maple sugaring. Pete’s Greens, Vermont’s largest organic vegetable farm, is in Craftsbury Village, employing more than 30 people.

Recreation is also an important sector of the local economy. The Craftsbury Outdoor Center has both long-term and overnight accommodations and four-season recreational activities. With a state-of-the-art Nordic facility and snow-making capabilities, the Center is a destination for early season training and nationally recognized races. The Outdoor Center employs more than 90 seasonal employees and about 20 full-time employees.

Sterling College on Craftsbury Common, one of only seven federally funded work-learning programs in the country, offers programming in sustainable agriculture and food systems, ecology, outdoor education, environmental humanities, and global field study programs. The College employees more than 40 people and has about 130 students.

Craftsbury Community Care Center, a Level III residential care home, is also a significant employer with more than 30 staff.

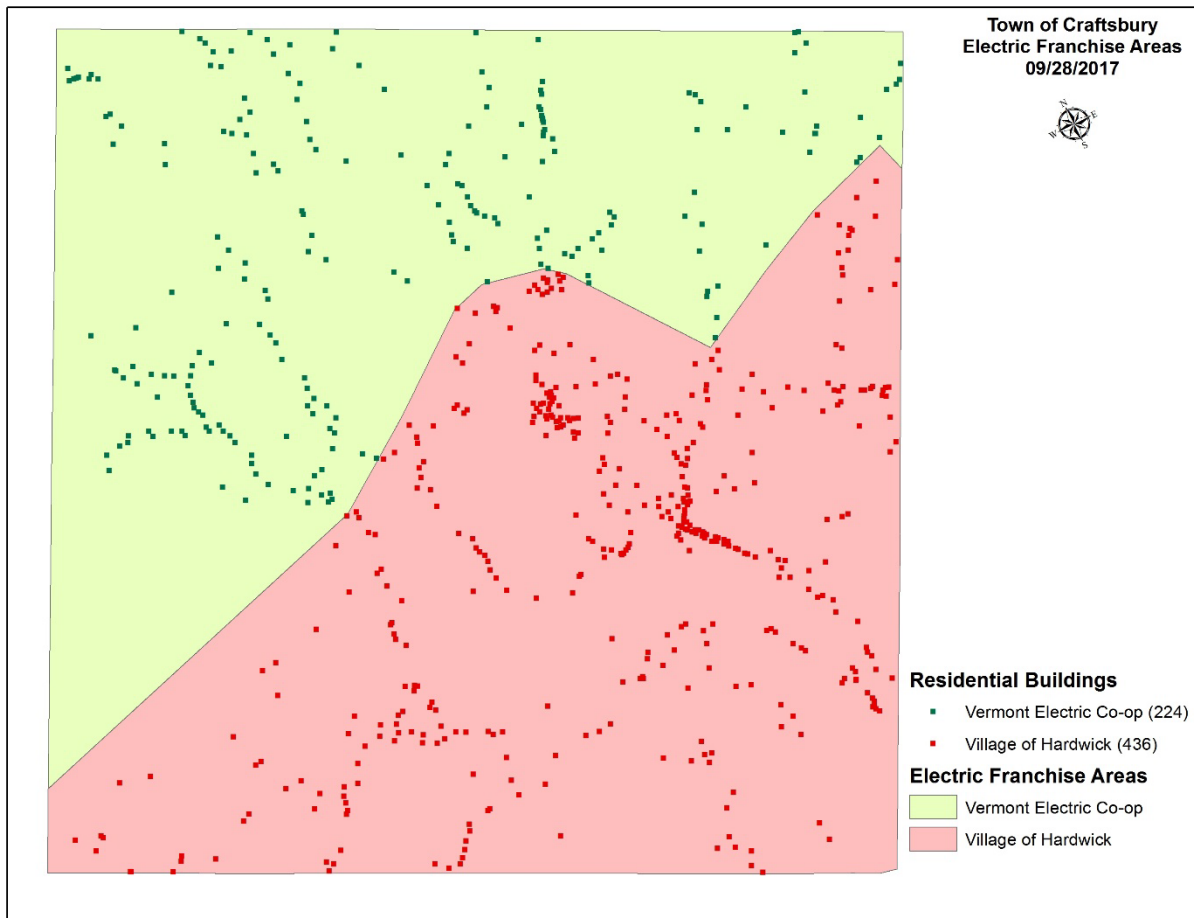
*Table 1C.1: Town Statistics*

Datum		Source
Population per square mile	34.17	U.S. Census Bureau
Total housing units	703	2020 Decennial Census
Occupied	553	
Vacant (including seasonal)	150	American Community Survey 2020 5-Year Estimates
Median age	45.3	
Median home value	\$173,900	Craftsbury listers, Town of Craftsbury 2021 Report
Homestead tax rate (per \$100)	2.229	
Non-residential tax rate	2.197	

### Electric Utility

Craftsbury is served by two utility companies, Hardwick Electric Department and Vermont Electric Cooperative.

Figure 1C.1: Electrical Utility Service Areas in Craftsbury



### Solid Waste

Craftsbury is a member of the Lamoille Regional Solid Waste Management District (LRSWMD), which was formed by the voters of its member towns on November 8, 1988. LRSWMD operates a collection station located on the Creek Road in Craftsbury Village, from 9:00 a.m. to 1:00 p.m. on Saturdays. The Craftsbury site accepts recyclables, trash, food scraps, batteries, light bulbs, and cell phones. Bulky wastes are accepted by the Town of Craftsbury on the 3<sup>rd</sup> Saturday in June.

### Emergency Response

Craftsbury has a volunteer fire department with 18 members who collectively participate in about 300 hours of training each year. Members have completed basic EMT classes and have passed state and national tests, allowing the department to respond to medical emergencies. Over the past five years, the Fire Department has responded to an average of 74 calls a year from the community and surrounding towns. Nearly 60% of the calls were for medical emergencies, about 10% for vehicular accidents, and about 11% for fires. The remainder were for alarm activations, including carbon monoxide alarms, and miscellaneous situations, such as suspected propane leaks. The Department has four vehicles, including a pumper, mini pumper, tanker, and a rescue vehicle.

When dispatching by Vermont State Police was consolidated into two locations for the entire state, the Vermont Department of Public Safety added call screening centers that field all the calls to then determine which dispatch location to forward the call. The added call screening has led to

miscommunications, a delay in response time, and increased staffing cost. The Department of Public Safety asked for towns to share in the added expense. In May 2022, the Town contracted with the Newport Police Department to cover emergency dispatch. The cost for was absorbed by the Fire Department the first year, but it will become a budget line in 2023. The cost of dispatch for 2022 is \$5,053.

Ambulance service is provided by Hardwick Emergency Rescue Squad Inc., a nonprofit, primarily volunteer ambulance service. Hardwick Rescue receives an annual appropriation from the Town, which is based on the average number of calls over the most recent five years. The Lamoille County Sheriff's Office Department handles the dispatching. Hardwick Rescue operates at the EMT level, which means that responders can provide certain forms of treatment onsite and during the ambulance ride to the hospital, such as controlling bleeding, stabilizing breaks, and addressing shock. They cannot administer fluids or drugs.

Police Protection is provided by the Vermont State Police in Derby.

The Town has identified Craftsbury Academy as the emergency shelter. Residents in Mill Village would likely be isolated in the event of a flood, so alternative arrangements are necessary. Additionally sheltering is available at North Country Union High School in Newport.

### Medical Facilities

Hardwick Area Health Center is a regional medical facility 12 miles away serving Craftsbury. The nearest hospitals are Copley Hospital in Morrisville (20 miles away) and North Country Hospital in Newport (32 miles away). Both hospitals have 25 beds and are considered "critical access" hospitals that give limited outpatient and inpatient hospital services to people in rural areas. With 562 beds, University of Vermont Medical Center in Burlington (60 miles away) serves all of Vermont and contains a Level 1 Trauma Center. Dartmouth Hitchcock Medical Center in Hanover, NH (90 miles away) has 396 beds and contains a Level 1 Trauma Center as well. Its air ambulance service, DHART, has airbases in Burlington and Manchester.

Craftsbury Community Care Center is a non-profit residence facility for elders with 24 private rooms. Approximately one-third of rooms are reserved for elders whose care is supported by Medicaid or other public pay, which covers less than one-third of the cost of care. The Care Center relies on donations to cover the balance. Greensboro Nursing Home (in the neighboring community) has 30 beds and is also a non-profit. Craftsbury is also served by Orleans/Essex Visiting Nurse and Hospice Inc. All three organizations request appropriations from the Town of Craftsbury at Town Meeting Day.

### Water and Sewer

The majority of the community is served by either drilled wells or springs. There are five public water systems in the community. Four are classified by EPA as "non-transient, non-community," because they have the capacity to serve at least 25 people for at least six months of the year: Craftsbury Elementary School, Craftsbury Community Care Center, Craftsbury Inn (currently not open to the public and under renovation), and Craftsbury Outdoor Center. All four systems must be registered with the Vermont Department of Environmental Conservation and are subject to regular monitoring. All but the Care Center have delineated source protection areas and are mapped on Appendix B.

Craftsbury Fire District # 2 (FD2) is the municipal corporation responsible for the non-transient, community water system that serves households and institutions around Craftsbury Common, including Craftsbury Academy, the Craftsbury Public Library, and most of Sterling College. The water system is managed by an appointed board, and the users of the system pay for its operation, ongoing maintenance,

and upgrades. Testing for PFAS contamination showed levels to be above 20 parts per trillion, which is the threshold for a “Do Not Drink” notice. The notice is currently in effect.

FD2’s water system lacks backup power to keep water flowing during Craftsbury’s frequent power outages. This is especially important because the water system serves the Town’s designated emergency shelter. FD2 is currently working with an engineering firm to work on a new source well and a plan for backup power.

All Craftsbury’s wastewater is handled by private on-site septic systems. The lack of off-site wastewater is influencing development and may be constraining growth in the Craftsbury Village area, which is the current focus of a master planning study.

### Town Governance and Town Properties

Craftsbury has a three member Selectboard who meet twice a month. There is a Town Clerk and Treasurer. Other town officers who are elected at Town Meeting Day include the Moderator, Collector of Taxes, Listers, School Directors, Auditors, Town Agent, Town Grand Juror, Cemetery Commissioners, Trustees of Public Funds, World War II Memorial Fund Trustees, Supervisor to Solid Waste District, and Library Trustee. The Selectboard appoints many additional officers and representatives to committees.

The Town Clerk’s Office and Town Garage are both located in Craftsbury Village. The Town Offices are used for numerous town committee meetings. The town garage houses the Fire Department and the Road Department’s equipment. Salt and gravel purchased by the town are also stored there. The town offices had a backup generator installed in 2019. Both buildings had smoke and fire alarm systems installed in 2017 to protect the inventory of the Town highway and fire trucks and land records. The alarm system will notify the Fire Department directly of a fire in either location. Also in 2017, the Town installed a solar array with a capacity of 7.9 kW on the salt shed. This installation, as well as the 19 kW solar tracker that had been previously installed near the Town Garage, help to defray electricity costs for the Town.

Craftsbury has two forests. The Coburn Hill forest is a 40 acre parcel and has a long-term management plan that was adopted in 2019. The other forest, which is comprised of three contiguous lots on Hatch Brook Road totaling 187.5 acres, has a management plan that was adopted in 2021.

The municipality also owns Craftsbury Common, which is open to the public for recreational activities. Individuals and groups wanting to use the Common for an event must submit an application to the Town Clerk’s office.

### Roads

Craftsbury roads are maintained by a three-person Road Department. Total department expenses are currently budgeted at just over \$790,000. Road equipment includes four trucks (including dump trucks and plows), a grader, loader, a culvert thawer, and a trailer.

Research and water quality monitoring has indicated that roads are responsible for 6-10% of phosphorus loads to Lake Champlain and other waterways, and roads contribute over 10% of sediment loads. Since 2015, Act 64, aka the Clean Water Act, requires municipalities to develop and implement a customized, multi-year plan to stabilize their road drainage system, bring road drainage systems up to basic maintenance standards, and implement additional corrective measures to reduce erosion. The plan is based on a comprehensive inventory of the road network that identifies priority road segments connected to surface waters through ditches, culverts or other drainage structures (i.e. “hydrologically connected”). Craftsbury, like all municipalities in Vermont, has had to prioritize road segments through a Road Erosion Inventory and develop remediation plans that can be carried out over time.



Craftsbury’s efforts to keep pace with requirements for hydrologically connected segments are supplemented by grants from VTrans, and the road crew’s current focus is on “hydraulically connected road segments” near or adjacent to streams and ponds.

*Table 1C.2 Craftsbury Road Mileage*

Class	Description	Mileage
State Highways		7.962
Class 1	State highways that run typically run through downtowns and village centers and are maintained by the municipality.	0.0
Class 2	Major connectors between high activity centers in a town. Town is required by statute to keep in “good and sufficient repair” all year.	18.230
Class 3	All other town highways that remain negotiable by a car throughout the year. Town is required by statute to keep in “good and sufficient repair” all year.	42.39
Class 4	Roads that the Selectboard may apply some discretion for maintenance. The Town has an adopted policy on Class 4 roads.	6.12

Source: VTrans Town Highway May, 2016 (most current)

### Critical Facilities

FEMA defines a critical facility as buildings or structures that provide services and functions essential to a community, especially during and after a disaster. Examples include – but are certainly not limited to – fire stations; emergency shelters; medical facilities; schools; nursing homes, day cares, and other facilities serving vulnerable populations; public utility infrastructure; drinking water supplies; and structures or facilities that store hazardous materials.

*Table 1C.3 Critical Facilities in Craftsbury*

Craftsbury Fire Department	Emergency first responders
Craftsbury Academy	School – and designated emergency shelter for town
Fire District #2	Public community water system serving Craftsbury Common, including the Craftsbury Public Library, Craftsbury Academy, and most of Sterling College.
Craftsbury Elementary School	School, and is served by a non-transient non-community water system with a delineated source protection area.
Craftsbury Outdoor Center	Served by a transient, non-community water system with a mapped source protection area
Craftsbury Community Care Center	This is a level 3 residential elder care home that can accommodate 24 residents. It is also served by a non-transient, non-community water system.
Underground storage tanks and potentially hazardous sites	Contaminated sites, in and of themselves, are not typically considered critical facilities, but those that are in a location that may be in a flood hazard area may constitute a risk to water quality and public health. Only USTs with a flood risk are indicated on the accompanying map.
Vt Route 14	Provides critical North-South transportation access
Sterling College	School
Craftsbury Town Offices	Site of municipal government operation and town records
Craftsbury Town Garage	Storage of town road equipment and vehicles
Craftsbury Fire Department	Emergency response capacity
Hardwick Electric/Vermont Electric Coop	Electrical transmission lines and infrastructure
Craftsbury General Store (water system only)	Transient non-community water system.
Craftsbury Inn* (water system only)	*This is not currently open, and is not considered a critical facility in and of itself. However, the facility is served by a transient, non-community water system

	designed to serve at least 25 people for at least six months of the year. The water system has a mapped source protection area
Craftsbury Saplings	Non-profit community children’s center providing early education from 15 months to 5 years
United Church of Craftsbury	Site of Craftsbury Food Share, which played a critical role in local response to COVID-19.
Great Hosmer Dam and Little Hosmer Dam	Dams operated by the Vt. Department of Environmental Conservation. These are considered “Low Hazard” dams but must be inspected every 10 years.

### Climate Change and Severe Weather Patterns

It is commonly accepted that weather extremes are becoming more commonplace in Vermont. From 1964 to 1985 there were eight Major Disaster Declarations in Vermont. Subsequent decades have seen a steady increase: From 1996 through 1986, there were six, from 1997-2007 there were 11, and from 2008 to 2018, 19. In just the past two years, there have already been four. Since 2011, record-setting snow, rain and cold have been experienced in the state. Of these disaster declarations, 25 have occurred in Orleans County. (See Table 1.4)

*Table 1C.4: FEMA Disaster Declarations in Orleans County, FY1964-present*

Declaration Number	Declaration Date	Incident Description
DR-160-VT	11.02.1963	Drought and impending freeze (this was a statewide declaration)
DR-164-VT	03.17.1964	Flooding (this was a statewide declaration)
DR-397-VT	07.06.1973	Severe storms, flooding and landslides
DR-518-VT	08.05.1976	Severe storms, high wind, and flooding
<b>DR-1063-VT</b>	<b>08.16.1995</b>	<b>Excessive rainfall, flooding</b>
<b>DR-1101-VT</b>	<b>02.13.1996</b>	<b>Ice jams and flooding</b>
<b>DR-1184-VT</b>	<b>07.25.1997</b>	<b>Excessive rainfall, high winds, and flooding</b>
DR-1228-VT	06.30.1998	Severe storms and flooding
<b>DR-1307-VT</b>	<b>11.10.1999</b>	<b>Tropical Storm Floyd</b>
EM-3167-VT	04.10.2001	Snow
<b>DR-1428-VT</b>	<b>07.12.2002</b>	<b>Severe storms and flooding</b>
DR-1559-VT	09.23.2004	Severe storms and flooding
<b>DR-1715-VT</b>	<b>08.03.2007</b>	<b>Severe storms and flooding</b>
<b>DR-1995-VT</b>	<b>06.15.20011</b>	<b>Severe storms and flooding</b>
<b>DR-4022-VT</b>	<b>09.01.2011</b>	<b>Tropical Storm Irene</b>
DR-4066-VT	06.22.2012	Severe storm, tornado, and flooding
DR-4140-VT	08.02.2013	Severe storms and flooding
DR-4163-VT	01.29.214	Severe winter storms
DR-4178-VT	06.11.2014	Severe storms and flooding
<b>DR-4207-VT</b>	<b>02.03.2015</b>	<b>Severe winter storm</b>
DR-4356-VT	01.02.2018	Severe storm and flooding
DR-4380-VT	07.30.2018	Severe storm and flooding
<b>DR-4474-VT</b>	<b>01.17.2020</b>	<b>Severe storms and flooding</b>
DR-4532-VT	04.08.2020	Biological – COVID 19 Pandemic
EM-3567-VT	08.22.2021	Hurricane – Tropical Storm Henri

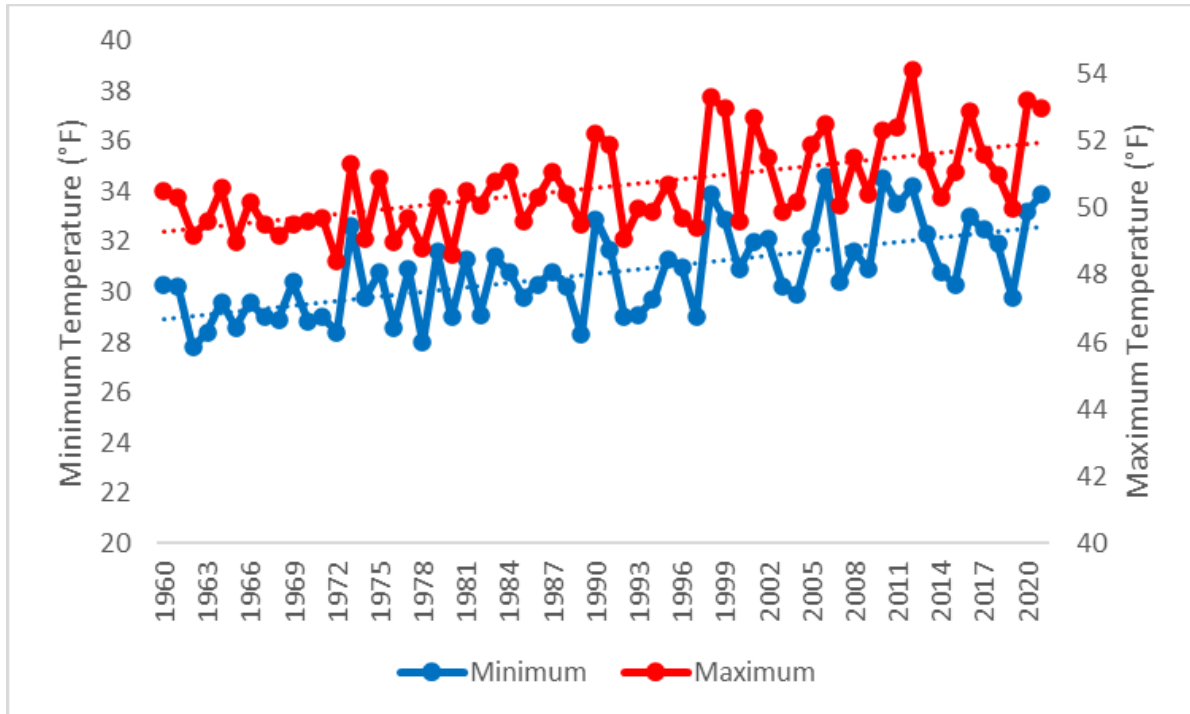
**Bolded text denotes public assistance FEMA funding for damage to public infrastructure in Craftsbury. Note: Open FEMA only has public assistance records going back to 1999. Pre-1999 public assistance data comes from the 2005 Craftsbury All-Hazards Mitigation Plan.**

In recent years, it has become evident that human activities, mostly associated with the combustion of fossil fuel, have added to the natural concentration of greenhouse gases in the atmosphere and are contributing to rapid climate change on a global scale. An analysis of annual minimum and maximum



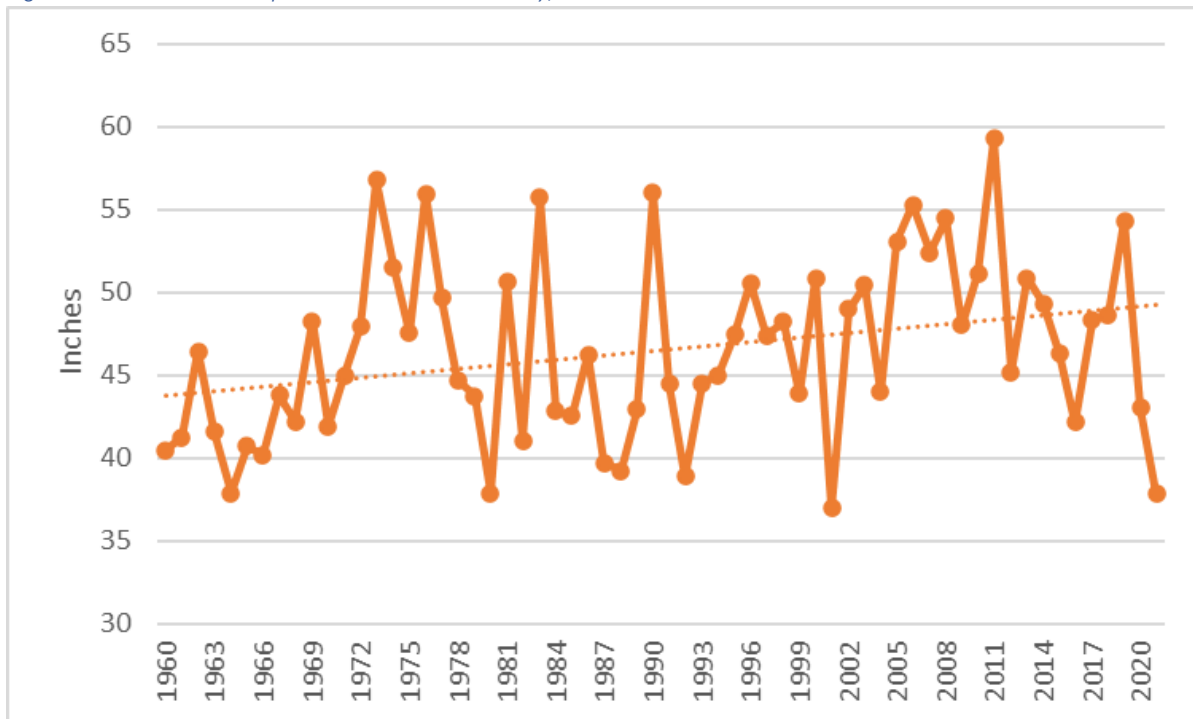
temperatures in Orleans County shows that minimum temperatures are generally rising faster (.6°F per decade) than maximum temperatures, (.4°F per decade). (See Figure 1.2).

Figure 1C.2: Minimum/Maximum Temperatures in Orleans County, 1960-2020



Annual precipitation is rising at a rate of about .89" per decade (See Figure 1.3). While projections of the effects of climate change vary, it is generally predicted that the region can expect to have warmer temperatures year-round, with warmer, wetter winters, and increasingly erratic patterns of precipitation.

Figure 1C.3: Annual Precipitation in Orleans County, 1960-2020



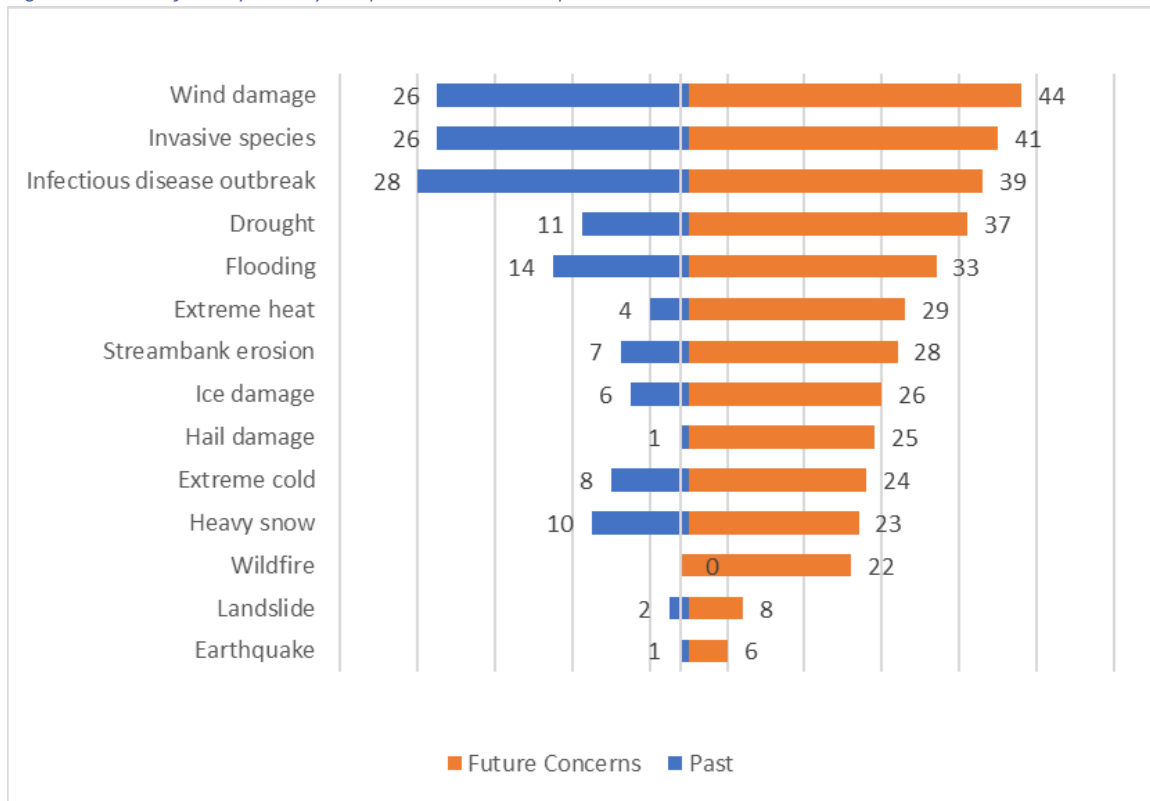
Sources: NOAA Climate at a Glance

USDA’s recent drought disaster declaration in Orleans County (and all other counties in Vermont) is not an aberration from the warming trend: According to the University of 2021 Vermont Climate Assessment, increasing variability of rain patterns and water tables makes both flooding and drought likely possibilities. We are moving to extremes: either too much rain or not enough. An increase in precipitation may result in increased flooding and fluvial erosion. Drier summers may increase the chance of drought and wildfire. A warmer climate may also result in the influx of diseases and pests that cold winters previously prevented. The Intergovernmental Panel on Climate Change (IPCC) forecasts a temperature rise of 2.5°F to 10°F over the next century, which will affect different regions in various ways over time. Increasing temperatures are expected to significantly exacerbate the impacts of natural hazards and net economic damages will continue to rise<sup>1</sup>.

Climate change was on the minds of respondents to the Craftsbury Hazard Mitigation Survey. Respondents indicated they were primarily negatively impacted by wind, invasives, and infectious disease outbreak over the past 10 years. By contrast, respondents indicated they were either mildly or very concerned about a much wider array of hazards in the future. (Figure 1.4)

<sup>1</sup> World Economic Forum: Climate Change is Making Disasters More Expensive. <https://www.weforum.org/agenda/2018/10/climate-disasters-cause-global-economic-losses-un/>

Figure 1C.4: Craftsbury Survey Respondents: Past Experiences vs. Future Concerns



Respondents specifically cited climate change for their rationale. “Climate – we need to be worried about all of these,” wrote one respondent. Appendix A has a summary of the survey results.

## 2. CRAFTSBURY HAZARDS AND POTENTIAL IMPACTS

### A. Hazard Identification Process

Effective mitigation efforts must be based on a rational evaluation method that answers three basic questions:

1. What bad things can happen, given the town’s vulnerabilities and loss history?
2. How likely are these hazards to occur?
3. How bad could they be?

The tables below represent Craftsbury’s inventory of known hazards, a determination of the likelihood of future occurrences, and assessment of the community’s vulnerability. By performing this analysis we can then prioritize actions to mitigate the impacts of each of these hazards and make Craftsbury a safer place.

To answer the above questions, we assembled as much data and insight on past events that we could find. Disasters that have occurred in the Town, the larger region, and the State of Vermont can give us good information about what types of disasters we can expect in the future and what kinds of damage they might cause. However, while historical data shapes our perspective, past

**This section of the plan satisfies requirement of CFR §201.6(d)(3): Was the plan revised to reflect changes in priorities?**

losses are by no means a crystal ball for predicting future events. Climate change is already changing our weather patterns, which means we can expect a proliferation in storm events with severe impacts as well as new challenges, like drought in summer and long winters characterized by heavy ice accumulation. Armed with historical data and a healthy respect for climate change and the unknown, the plan represents the town’s best attempt to identify hazards and prepare for the future.

Craftsbury’s 2005 Local Hazard Mitigation Plan identified *flooding, potential dam failures, and power outages* as the highest risks to the community. To update the plan, the Craftsbury Hazard Mitigation working group considered the hazards profiled in the 2018 Vermont Hazard Mitigation Plan, as well as all the hazards originally assessed in the 2005 Craftsbury Plan. The group revised priorities from the 2005 plan along these guidelines:

- **Events vs. Impacts:** Instead of continuing to view hazards as events (such as hurricanes or tornadoes), the Vermont Hazard Mitigation Plan assesses the *impacts of events* (e.g. inundation flooding, fluvial erosion). This is a logical way to assess hazards since it is the impacts, not the events, that can be mitigated. For example, while tornadoes are not as common as microbursts in Vermont, both events can produce powerful winds that damage structures and bring down trees.
- **Natural vs. Man-made:** Man-made disasters in local plans, such as acts of terrorism, are not reviewed by FEMA or Vermont Emergency Management staff. In fact, FEMA does not provide mitigation funds for man-made hazards. While man-made hazards are certainly not insignificant concerns, the Craftsbury Hazard Mitigation working group felt it was prudent to prioritize its time and resources on natural hazards and address man-made hazards through other more appropriate channels, such as regional emergency preparedness exercise and the Local Emergency Operations Plan. Nevertheless, some “hazards” considered in Craftsbury’s previous plan should be considered as *vulnerabilities* to natural hazards. Water supplies, for example, are more prone to contamination during periods of drought. High and damaging winds can lead to power failures.

It is important to note that since the development of its 2005 plan, Craftsbury remains a rural community marked by low-density rural development. While the town is one of the few communities in Orleans County to experience a population increase in the most recent Census, *learned experiences*, rather than changes in development patterns, have reshaped hazard planning priorities. At the time the original plan was adopted, few could anticipate the myriad impacts of climate change, the introduction of invasive and non-native species, rising temperatures, and increasingly erratic weather patterns. Moreover, the likelihood of a global pandemic and its crippling impact on nearly every aspect of daily life was purely hypothetical.

Table 2A.1: Craftsbury Hazards, 2005 vs. 2022

Hazards originally considered in 2005	...are now considered
Tornado (wind sheers, microbursts) Power failures High winds Hurricane	Wind ( <i>with power failures a vulnerability of winds and ice</i> )
Flood Flash Floods Hurricane Dam Failure	Fluvial inundation Fluvial erosion ( <i>with dam failures a vulnerability of flooding or possibly earthquakes</i> )
Winter storm/Ice Structure fires	Snow Ice

	Cold (with structure fires a vulnerability of a heating season)
Drought Water Supply contamination	Drought, with water supply contamination a vulnerability of drought

Craftsbury’s Plan from 2005 also evaluated wildfires, earthquakes, and landslides, which are also evaluated in the 2018 Statewide Hazard Mitigation Plan. Additional hazards – heat, invasive species, infectious disease outbreak, and hail – were not included in Craftsbury’s 2005, but were evaluated in the Statewide Hazard Mitigation Plan. The working group then evaluated a list of hazards using the same methodology to determine their highest priority hazards:

**Probability x Average impact score = Overall Score**

Table 2A.2: Probability and Impact Scoring

Score	Probability
1	<b>Unlikely:</b> <1% probability in any year
2	<b>Occasionally:</b> 1-10% of occurrence in any year; at least 1 chance in 100 years
3	<b>Likely:</b> >10% but < 75% in any year; at least one chance in next 10 years
4	<b>Highly likely:</b> >75% in any given year

Score	Impact
1	<b>Negligible:</b> isolated occurrences of minor property and environmental damage, potential for minor injuries, no to minimal economic disruption
2	<b>Minor:</b> isolated occurrences of moderate to severe property and environmental damage, potential for injuries, minor economic disruption
3	<b>Moderate:</b> severe property and environmental damage on a community scale, injuries or fatalities, short-term economic impact
4	<b>Major:</b> severe property and environmental damage on a community or regional scale, multiple injuries or fatalities, significant economic impact

Table 2A.3 All Hazards Assessed

Hazard Impact	Probability	Infra-structure	Potential Impact				Avg.	Score
			Life	Economy	Environment			
Infectious disease outbreak	4	4	3	4	2	3.25	13	
(Inundation) Flooding	4	2	3	3	4	3	12	
Fluvial Erosion	4	3	2	2	4	2.75	11	
Ice	4	3	2	3	2	2.5	10	
Wind	4	4	2	2	2	2.5	10	
Wildfire	3	3	3	2	3	2.75	8.25	
Drought	3	3	1	3	3	2.5	7.5	
Cold	4	2	2	2	1	1.75	7	
Invasive Species	4	1	1	2	3	1.75	7	
Hail	4	2	1	3	1	1.75	7	
Snow	4	3	1	1	1	1.5	6	
Heat	3	1	2	2	1	1.5	4.5	
Landslide	1	1	1	1	2	1.25	1.25	
Earthquake	1	1	1	1	1	1	1	

The highest risks to the town (risks to be profiled) were those with an overall score of four or higher. Each of the “priority” hazards will be profiled to identify the following factors in accordance with FEMA requirements. Landslide and earthquake have a low probability and will not be profiled.

- **Location:** General areas in community that may be vulnerable to the hazard.
- **Vulnerability:** Community structures, systems, populations, or other assets as defined by the community that are susceptible to damage and loss from hazard events.
- **Extent:** The strength or magnitude and details of the most notable event(s).
- **Observed impact:** Financial impact from an event, and/or the number of structures that are impacted.
- **Likelihood/Probability:** Occasionally: 1-10% of occurrence in any year; at least 1 chance in 100 years; Likely: >10% but < 75% in any year; at least one chance in next 10 years; Highly likely: >75% in any given year

## B. Hazard-Specific Information for Profiled Risks

### 1. Infectious Disease Outbreak

COVID’s unprecedented disruption of daily life is a grim reminder that climate change increases the risk of future infectious disease outbreaks. According to the Centers for Disease Control, vector borne illnesses such as Lyme disease, West Nile virus disease, and Valley fever are already on the rise and spreading to new areas of the United States. Milder winters, warmer summers, and fewer days of frost make it easier for these and other infectious diseases to expand into new geographic areas and infect more people.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Infectious Disease Outbreak**

The COVID-19 pandemic resulted in the first ever major disaster declaration of all 50 states, five territories, and the District of Columbia. In March of 2020, by Executive Order No. 01-20, the Governor declared a State of Emergency for Vermont, and restrictions to protect public health were enacted.

While a variety of measures were recommended by the Center for Disease Control and the Vermont Department of Health to help curb the spread of disease, including frequent hand washing, wearing masks, and keeping a distance of 6 feet from other persons, vaccination was identified as the best way to keep from getting and spreading COVID-19. In Vermont, the vaccine was first made available to residents and staff of long-term care facilities in December 2020, and then to those 75 and older in mid-January 2021. The Vermont State of Emergency was extended for over a year until all restrictions were lifted on June 14 of 2021, when the benchmark of an 80% vaccination rate for the eligible population of Vermont was reached.

Even though the State of Emergency is behind us, the COVID-19 crisis is still unfolding, and the long-term impacts are still unclear. As of July 13, 2022, the Vermont Department of Health reports that there have been 687 COVID deaths in Vermont. The death toll is based on death certificates that list COVID as a cause or probable cause of death. In Orleans County, the Department of Health reports a total of 6,911 cases with 38 deaths. The Department of Health does not publish death counts at the municipal level, but Craftsbury losses were reported anecdotally through church congregations and elsewhere, with a serious outbreak at a residential care home during which three-quarters of its residents and half its staff contracted the disease and two residents sadly passed.

The pandemic was the predominant natural hazard among Craftsbury survey respondents – for past experiences and concern over future hazards. Twenty-eight respondents reported they had been adversely affected, and four respondents alluded to a loss or hindrance of gainful employment. Sixteen respondents were mildly concerned about future infectious disease hazards and 23 respondents were extremely concerned. Essential services, government operations, schools and businesses were severely disrupted during COVID, requiring rapid implementation of safety protocol to continue critical operations. While “social distancing” was an appropriate response to mitigate the spread, all sectors of Craftsbury population experienced some form of disruption, especially those with no broadband or spotty broadband coverage. The pivot to a virtual environment has demonstrated that reliable broadband is a vital utility for business, work, school, healthcare, and civic involvement.

With so many individuals unable to work or working reduced hours, food insecurity (defined as a lack of consistent access to enough food for an active, healthy life<sup>2</sup>) increased. In a University of Vermont survey, 441 Vermonters were interviewed at the following intervals: March/April 2020, June 2020, and March/April 2021. Of those surveyed, 31.9% were food insecure at some point during the pandemic. Of those who experience food insecurity during the pandemic, 46.9% were food insecure prior to the pandemic but the remainder were *newly* food insecure. The survey also found that those who were more likely to experience food insecurity were people without a college degree, those with a job disruption, households with children, women, and younger people.<sup>3</sup>

The Craftsbury Neighbor to Neighbor Initiative (CN2N) was formed in early March of 2020 by a group of citizens concerned about the wellbeing of the town during the pandemic. By mid-March CN2N was approved by the Select Board as an official town task force with the mission of aiding and supporting the community during times of distress. CN2N quickly mobilized to address food insecurity by staffing and managing the Craftsbury-Albany weekly pop-up food pantry at the Craftsbury Church on the Common. Food distribution to nearly 90 families began in the spring of 2020 with volunteer labor, donated food and cash donations from the Albany/Craftsbury Food Fund. In the fall of 2020, the Craftsbury and Albany

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<sup>2</sup> Feeding America. What is Food Insecurity? <https://hungerandhealth.feedingamerica.org/understand-food-insecurity/>

<sup>3</sup> University of Vermont. Food Security Impacts of the COVID-19 Pandemic: Following a Group of Vermonters During the First Year <https://scholarworks.uvm.edu/calsfac/186/>



efforts became satellite sites of the Hardwick Area Food Pantry and a part of the Vermont Food Bank system. This partnership brought much-needed resources including a paid manager, while allowing the Craftsbury pantry to retain its unique characteristics including providing as much locally produced food as possible. To date, the popup food pantry is still hosted by the Church on the Common but the search is on for a permanent location.

CN2N has also developed an agile approach for disseminating important information in a rapidly evolving situation, using multiple outlets such as Front Porch Forum and social media. This information network proved useful when town’s transfer station was temporarily closed, creating an environmental and health risk from improper disposal of plastics and hazardous wastes. The group worked with the Lamoille Regional Solid Waste Management District to inform the public about alternative disposal sites and keep the public informed when the transfer station reopened.

CN2N’s current priorities include:

- Getting information out to all Craftsbury residents regarding COVID 19
- Supporting the vulnerable by checking-in and delivering food and supplies
- Providing information about available resources
- Identifying gaps in services and finding ways to address them
- Making food available to anyone who needs it
- Providing emotional support for all

CN2N’s rapid mobilization sets the foundation for community-based humanitarian relief in future hazards, and its operations will be embedded into the Town’s Local Emergency Management Plan.

Table 2B.1.1: Infectious Disease Summary Table

Location	Vulnerability	Extent	Observed Impact	Likelihood/Probability
Townwide	Seniors, people with underlying conditions; critical facilities and healthcare	Statewide emergency declaration from March 13, 2020 to June 14, 2021.	38 confirmed deaths in Orleans County, local outbreak, no published data on death counts at the municipal level, but some were confirmed anecdotally or through media; job loss and food insecurity; isolation	<b>Highly likely:</b> >75% in any given year

## 2. Flooding (Inundation and Fluvial Erosion)

Floods can damage or destroy public and private property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and result in fatalities. People may be stranded in their homes for a time without power or heat, or they may be unable to reach their homes. Long-term collateral dangers include the outbreak of disease, loss of livestock, wash out of septic systems causing water supply pollution, downed power lines, loss of fuel storage tanks, fires and release of hazardous materials.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Flooding (Inundation and Fluvial Erosion)**

Craftsbury encompasses two tactical basin planning areas. (A “basin” is an area of land drained by a river and its tributaries):



**Memphremagog Basin (Basin 17):** Covering roughly the eastern half of town, this area includes the Black River, which runs the length of Craftsbury from south to north and drains 134 square miles of land. The river originates east of Great Hosmer Pond with headwater tributaries flowing west off Ames Hill in Albany. It then continues in a generally southerly flow into the town of Craftsbury, entering a wider valley east of Duck Pond. Whitney Brook, and then the drainage from Little Hosmer and Great Hosmer Ponds, join the river. South of Craftsbury village, the river reverses course and flows northwesterly with Lake Eligo's outlet stream joining the river from the east. The river twists and turns its way north through a broad valley, which contains many significant floodplain and wetland communities. The river continues through Albany, Irasburg, and Coventry until it joins the South Bay of Lake Memphremagog. The Black River watershed contains over 600 acres of lakes and ponds, the three largest being Lake Eligo, Little Hosmer Pond and Great Hosmer Pond.

Tropical storm Irene dumped four to five inches of rain on the narrow river valleys of Basin 17. With soils already saturated from a wet August the runoff quickly filled river channels beyond their recognized floodplains and rivers, ripped out roads, bridges, culverts and buildings (although this basin was spared the worst of the flooding that was seen across much of central and southern Vermont). Earlier that year spring rains and melting snow filled streams, raising Lake Memphremagog to levels not seen since the late 1930's and the Clyde River to levels not seen since 1936. These early spring storms and tropical storm Irene also led to eroding rivers and land erosion, which sent plumes of phosphorus-loaded sediment into lakes, nearly doubling previous average levels of annual phosphorus loading from major tributaries.

**Lamoille Basin (Basin 7):** This area covers the western half of town and includes the Wild Branch. The Wild Branch has a watershed size of 39.3 square miles just above the confluence of the Lamoille River in the Town of Wolcott and drains from its headwaters in the Lowell Mountains near the Lamoille County and Orleans County boundary. The Wild Branch heads south through the Town of Eden and then briefly flows through the Wild Branch State Wildlife Management Area. Downstream of the Wildlife Management Area, the Wild Branch flows into Orleans County within the Town of Craftsbury and then crosses back into Lamoille County in the Town of Wolcott. The Wild Branch flows into the Lamoille River at approximately 665 feet above sea level, which then drains westerly into Lake Champlain.

Gravel excavation has taken place along the Wild Branch over the years, which has led to channel straightening, removal of woody vegetation and loss of large woody debris. This has contributed to channel instability both within and downstream of the mined areas. The lack of natural grade controls may be one reason the Wild Branch watershed has undergone so much incision and channel adjustment. Bank erosion and mass wasting caused by channel adjustments and lack of riparian vegetation has led to excessive build-up of sediment in the channel. The channel modification activities, floodplain encroachments, gravel mining, channel straightening, and excessive build-up of sediment have also resulted in reduced aquatic habitat. The most extensive areas of channel straightening and floodplain encroachments are within the middle main stem reaches between Wild Branch Lane in Wolcott and Denton Hill Road in Craftsbury.

#### *Inundation Flooding*

This is the type of flooding that occurs when heavy precipitation and ice jams cause streams to spill over into adjoining low-lying lands called floodplains. This risk is associated with moderate to severe community scale impact to life, economy and environment due to damage to personal property, businesses, and business disruption. Major community-scale environmental impacts may be due to sedimentation deposit, loss of crops and loss of water quality. There is also potential for moderate to severe, but isolated damage to infrastructure, particularly roads. Inundation may also leave roads impassable due to standing water.

Craftsbury has adopted floodplain regulations which reference the FEMA Flood Insurance Rate Map (FIRM), which was first identified in 1974, revised in 1976, and made effective in 1985. This map depicts inundation flooding risk. Inundation flooding, which is characterized as the rise of riverine and lake water levels, occurs during significant levels of precipitation from rainstorms, thunderstorms, or hurricanes or tropical storms. It can also occur due to rapid snow and ice melt during rapidly rising temperatures in the late winter or spring.

Craftsbury's FIRM is a paper map (i.e. not georeferenced) and is organized on 14 separate panels, two of which are not printed by FEMA because they contain no information. FEMA did not conduct a Flood Insurance Study, so the map lacks critical detail such as base flood elevations (how high the water might be expected to rise in a significant flood event) or delineation of floodways (portions of the stream channel where flood waters run the deepest and fastest during a flood). Most areas of special flood hazard appear as an "approximate Zone A" and include the Black River, Seaver Brook, Whitney Brook, Little Hosmer, Duck Pond, Mud Pond, Wild Branch, Eligo Lake, and Webber Brook. The age of the maps and lack of detail make it difficult to determine how many structures may actually be prone to flooding. NVDA was able to complete a rough "digitization" by overlaying a scan of the FIRM over a base map in GIS. NVDA's best estimate is that 49 structures may be located in the flood hazard areas on the FIRM. Just under half of these structures are residential (single-family homes and mobile homes). The remainder are mostly seasonal camps. The Town Garage may be located in the flood hazard area on the FIRM as well. All this information is a rough approximation, and Craftsbury's revised flood maps are currently in draft development. Additional site investigation is necessary.

Development in the Zone A areas on the FIRM require a permit. There have been about a dozen permits issued in Craftsbury since the flood hazard regulations were adopted in 2001. Because the paper map is difficult to interpret, most of the permits for development have been found to be located outside of the flood hazard area.

Dam failure is another potential source of inundation flooding. Craftsbury has two dams, Great Hosmer Pond Dam and Little Hosmer Pond Dam. Both are owned by the State of Vermont Department of Environmental Conservation (DEC) and are periodically inspected by the DEC. Both are considered "Low Hazard," which means that no direct loss of life can be expected from dam failure, although there may be isolated incidents of loss of agricultural lands, equipment, or non-residential buildings. Low hazard dams are inspected every 10 years. Great Hosmer Dam was inspected in 2021, and Little Hosmer Dam was inspected in 2022. Great Hosmer Dam does not have a flood inundation map. Little Hosmer has a flood inundation map in development.

#### *Fluvial Erosion*

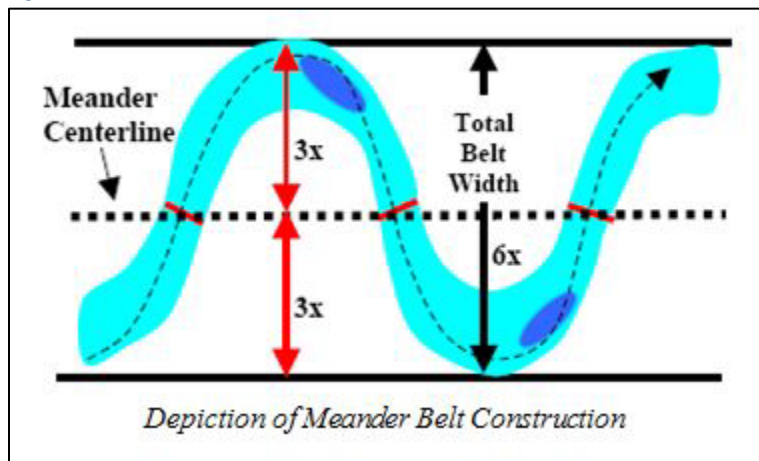
The Vermont Agency of Natural Resources estimates that inundation areas have only been mapped for about 20% of Vermont's stream miles. The more common mode of damage is associated with the dynamic, and often catastrophic, physical adjustment of stream channel dimensions and location during storm events. These adjustments are often due to bed and bank erosion, debris and ice jams, or structural failure of or flow diversion by man-made structures. Fluvial erosion can lead to moderate to severe community-scale damage to infrastructure, which includes washed out roadways. There also can be major community-scale impacts to environment, which includes collapse of streambanks, and severe disruption of riverine habitat. Increased sedimentation loads can damage water quality. There are moderate-to-severe threats to personal safety, private property, and businesses from structural damage, but these are likely to occur on an isolated scale.

The Vermont Rivers Program of the Agency of Natural Resources has released statewide data on areas subject to fluvial erosion for all streams and rivers. These risk areas are defined by Vermont Statute as

“River Corridors,” land area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of a dynamic equilibrium condition.

Mapped river corridors along streams with a drainage area of two miles or more consist of two components: a *meander belt* and a *riparian buffer*. The meander belt is an area calculated to accommodate the amplitude of stream meanders that have or will form in response to the laws of physics which dictate that channel depth and slope evolve toward a state of minimal work (i.e., equilibrium or least erosive form). The width of the meander belt will vary depending on the amount of land draining to a given point on a stream, so the River Corridor width varies in part based on stream size. (See Figure 2B.2.1)

Figure 2B.2.1: River Corridor Meander Belt



Source: Vermont Agency of Natural Resources, <https://floodready.vermont.gov/>

The riparian buffer is an extension of the meander belt to provide additional protection. A naturally vegetated buffer helps to protect streambank stability if the meander moves to the edge of the meander belt. If this extension were not included and structures were planned at the very edge of the meander belt, a prospective home or business owner would need to armor the riverbank to protect the structure.

For streams with a drainage of less than two square miles, a riparian buffer of 50 feet on either side of the top of the streambank is deemed sufficient to accommodate lateral movement of the stream channel.

Analysis of ANR River Corridor Maps indicates there may be 42 properties in the river corridor, 26 of which are probably not located in the Special Flood Hazard Area. Approximately 80% of these structures are residential properties (single-family homes and mobile homes). The Town Garage may be located in the river corridor as well. As with the FEMA Firms, this data requires additional vetting and site investigation.

ANR’s River Corridor Maps do not indicate any required action on the part of municipalities. They are developed to facilitate ANR’s responsibilities in Act 250 to protect public safety from fluvial erosion hazards and to regulate activities exempt from zoning and local land use regulations under the Flood Hazard Area and River Corridor Rules. Municipalities are strongly encouraged – but are not required – to regulate development in the river corridor as part of their flood hazard regulation. Given the amount of sediment load and stream instability in both of Craftsbury’s watersheds, there are significant advantages to adopting river corridor regulations.

Most of the flooding that Craftsbury experiences is flash flooding. Flash floods occur when severe storms drop high amounts of rainfall in short periods of time. Precipitation falls so quickly that the soil is unable to absorb the water, which results in surface runoff that collects in small, upstream tributaries, that then moves quickly downstream at a high velocity. Stream alteration from fluvial erosion will exacerbate the effects of flash flooding. Due to the town's topography, Craftsbury typically experiences some fluvial erosion with each major flooding event listed. However, extent data for fluvial erosion is unavailable due to a lack of a central repository for this information to be collected after flood and fluvial erosion events.

The one major flood event in Vermont's history by which all other events are judged is the Flood of 1927. Severe loss of life and property was experienced. Statewide, more than 50% of bridges and roads were damaged in the flood that occurred on November 27<sup>th</sup> of that year. Flooding was statewide. Most bridges over roads were installed after that flood and are now being methodically replaced by the Vermont Transportation Agency on state roads and highways. Orleans County has been experienced 25 Presidentially Declared Disasters since 1964, and all but five involved some form of flooding.

Most of the flooding damage in Craftsbury has been to roads and bridges, but at least one resident has experienced loss of personal property due to water surrounding a home. Fourteen respondents to the Hazard Mitigation Survey indicated they had been adversely impacted by flooding in the past ten years. Two respondents referred to flooding in basements and driveways, and three cited flooding in roadways or washouts. Seven respondents indicated they had been adversely affected by streambank erosion in the past ten years. Two respondents cited instances of erosion, and another voiced concern about the streambank constantly folding into the river.

From 1995 to 2002 Craftsbury received assistance from FEMA from five federal flooding disaster declarations totaling more than \$644,000. The damage was primarily to roads and bridges. The NOAA Storm Event database has more details about flooding events from 2007 to the present.

*Table 2B.2.1 Significant Flood Events in Craftsbury*

Date	Description and Impacts	Damage
7/11/2007	A warm and very moist airmass was draped across Vermont. In addition a slow-moving cold front entered Vermont from west to east during the afternoon. This front promoted the development of numerous tropical-like showers and thunderstorms that repeatedly generated and moved over the same areas of central and eastern Vermont. Localized heavy rainfall exceeded 3 inches within a two-hour time frame with some localized storm totals approaching 6 inches across very hilly or mountainous terrain, which resulted in flash flooding of several communities. Craftsbury was among the communities receiving the hardest impacts. There were washed out roads, flooded basements and homes damaged or destroyed. This event resulted in FEMA Disaster Declaration 1715, and the Town received \$50,432 in public assistance.	\$67,242 in total damage to roads and bridges in Craftsbury.
06/01/2011	A severe storm caused flash flooding resulting in FEMA declaration 1995. Craftsbury received \$21,809 in public assistance from FEMA.	\$29,079 in total damage to roads and bridges in Craftsbury.
09/01/2011	Tropical Storm Irene moved across southeast New York and southwest New England during the morning hours of August 28 <sup>th</sup> and then proceeded to track north along the Connecticut River Valley in Vermont during the afternoon and evening. The main impact from Irene was widespread devastating flooding, especially for central and southern Vermont. Widespread rainfall amounts of	\$18,072 in total damage to roads and bridges in Craftsbury

	3-5 inches occurred across Vermont with 5 to 7+ inches across much of southern, central Vermont and elevations above 1000 feet along the spine of Vermont's Green Mountains and the Worcester range. This event resulted in disaster declaration 4022, and the Town received \$16,265 from FEMA in public assistance.	
11/01/2019	Steady rain developed during the mid to late evening of October 31st and became heavy at times through the early morning hours of November 1st. Rainfall amounts 1.5 to 2 inches were common across much of Vermont with a swath of 2 1/2 to 4 inches across northwest and north central Vermont. Numerous flooded streams and washed out roads were reported in northern Vermont beginning just after midnight on November 1st and several larger rivers flooded as well, including the Lamoille, Missisquoi basins. Damage and debris to many Craftsbury roads, resulting in FEMA Disaster Declaration 4474. The town received \$81,279 from FEMA in public assistance. <i>(Note: This event also produced damaging winds and power outages. See Section 2.B.3 Wind.)</i>	\$90,310 in total damage to roads and bridges in Craftsbury

Table 2B.2.2: Flood Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Land adjacent to streams and ponds, river corridors, inundation areas around dams, roadways and areas downstream of undersized culverts and bridges	Culverts, bridges, dams. 49 structures possibly located in floodplains, and 42 in river corridors; underground storage tank possibly in flood hazard area. Town garage may be in both areas.	DR 4474, with \$90,310 in damage to roads and bridges.  Extent data on flooding due to fluvial erosion is not available.  No historical data on dam failures	Damage and debris to roads; flooding to residential properties; stream bank collapse.	<b>Highly likely:</b> >75% in any given year

### 3. Wind

The Beaufort Wind Scale, one of the first scales to estimate wind speeds, was created by Britain's Admiral Sir Francis Beaufort in 1805 to help sailors estimate the winds via visual observations. The scale starts with 0 and goes to a force of 12. The Beaufort scale is still used today to estimate wind strengths. The table below, which focuses on specifications for land, provides perspective on the wind strengths that can be expected in Craftsbury.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Wind**

Table 2B.3.1: Beaufort Wind Scale

Speed				
Force	MPH	Knots (KTS)	Description	Specifications for Land
0	0-1	0-1	Calm	Calm; smoke rises vertically.
1	1-3	1-3	Light air	Direction of wind shown by smoke drift, but not by wind vanes.
2	4-7	4-6	Light Breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
3	8-12	7-10	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag.

4	13-18	11-16	Moderate Breeze	Raises dust and loose paper; small branches are moved.
5	19-24	17-21	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	25-31	22-27	Strong Breeze	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7	32-38	28-33	Near Gale	Whole trees in motion; inconvenience felt when walking against the wind.
8	39-46	34-40	Gale	Breaks twigs off trees; generally impedes progress.
9	47-54	41-47	Severe Gale	Slight structural damage occurs (chimney-pots and slates removed)
10	55-63	48-55	Storm	Seldom experienced inland; trees uprooted; considerable structural damage occurs.
11	64-72	56-63	Violent Storm	Very rarely experienced; accompanied by wide-spread damage.
12	72-83	64-71	Hurricane	This is approaching a Category One Hurricane, according to the Saffir-Simpson Wind Scale: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.

Source: NOAA

Hurricanes are rare in Vermont, as are tornadoes. The National Oceanic and Atmospheric Administration (NOAA) lists three types of wind events that have affected Craftsbury from 1/1/1990 to 3/31/2022:

- **Thunderstorm Wind:** Winds arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 50 knots (58 mph), or winds of any speed (non-severe thunderstorm winds below 50 knots) producing a fatality, injury, or damage. There are 69 thunderstorm wind events recorded in the NOAA database, and six events reported had impacts in Craftsbury.
- **Strong Wind:** Non-convective winds (i.e. not associated with a thunderstorm) gusting less than 50 knots (58 mph), or sustained winds less than 35 knots (40 mph). There were 23 events reported in the NOAA Storm Event Database from 1/1/ to 9/30/2021 in Caledonia County. There were no specific impacts reported for Craftsbury, but one event was the notorious Halloween storm of 2019, which incurred significant flooding impacts in Craftsbury and sustained power outages.
- **High Wind:** sustained non-convective winds of 35 knots or greater lasting for 1 hour or longer, or winds (sustained or gusts) of 50 knots for any duration, on a widespread or localized basis. There are 14 high wind events in the NOAA database, and four events specify impacts in Craftsbury.

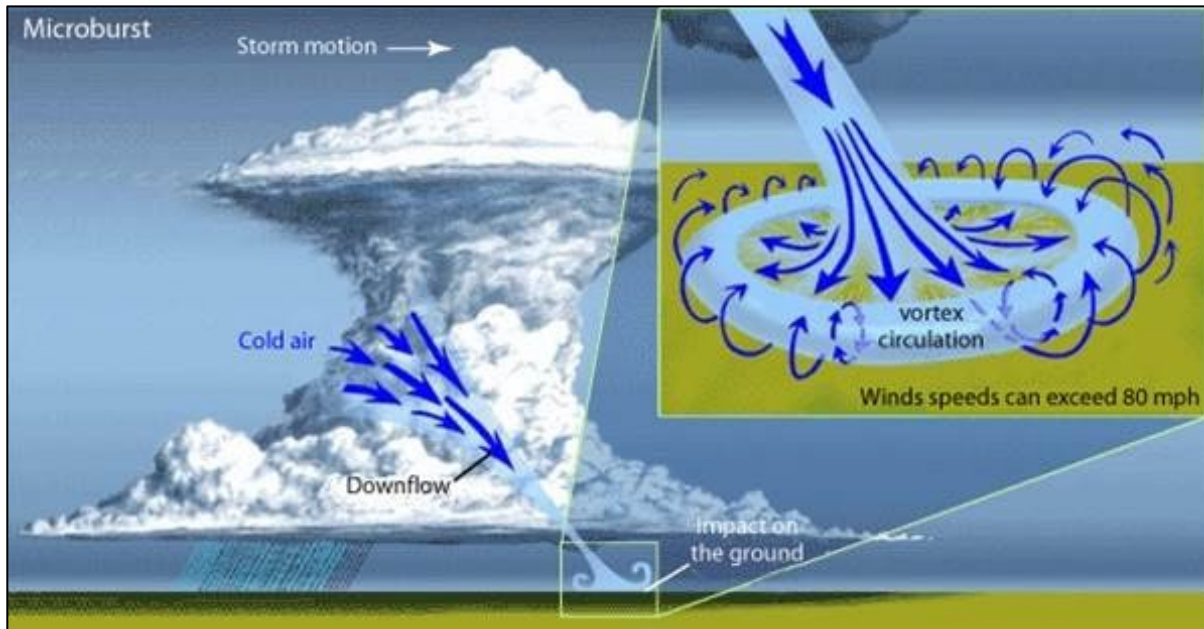
Craftsbury residents frequently experience downed trees and power outages from wind and they occasionally experience structural damage. Twenty-six survey respondents indicated they had experienced wind damage in the past 10 years. Most respondents cited downed trees and power outages; one respondent also indicated that downed tree limbs had damaged an automobile. Since most residents are on private wells, they also lose their water when the power goes out.

The most damaging winds that Craftsbury experiences are “straightline” winds, i.e. thunderstorm winds that are not rotational like a tornado. Of particular concern are thunderstorm winds associated with a microburst, which can rapidly approach 11 or 12 of the Beaufort Scale.



The National Weather Service defines a microburst as a localized column of sinking air (downdraft) within a thunderstorm, that is usually less than or equal to 2.5 miles in diameter. (Figure 2B.3.1)

Figure 2B.3.1: Microburst



Source: NOAA

Ideal conditions for microbursts occur in hot humid conditions and can be exacerbated by instability, high levels of precipitative water, and converging air in the middle of a thunderstorm. It occurs when large amounts of water or hail are suspended in the updraft. Evaporational cooling and sinking air weaken the updraft to the point where it can no longer hold up the large core of rain or hail. Subsequently, the core plummets to the ground, spreading out in all directions. The location where the microburst first hits the ground incurs the greatest damage, which include high winds. The phenomenon usually lasts just a few minutes, but the damage can be intense.

Forecasting for microbursts is near to short term (6-12 hours) and is based on the atmospheric conditions likely to lead to a microburst. However, microbursts can also occur without any warning at all because they can form quickly between radar scans.

Non-convective winds, though of lesser magnitude, have also inflicted damage property damage in Craftsbury.

Table 2B.3.2: Significant Wind Events in Craftsbury, 1990 to present

Date	Type	Magnitude	Description and Impacts	Damage
5/17/2014	Thunderstorm wind	65 kts	An unseasonably strong upper atmospheric low delivered a weak cold front and surface wave across Vermont during the early morning hours of May 17th. A thunderstorm developed across central Vermont and moved across Craftsbury, where it produced a localized microburst. Nearly a dozen trees uprooted, roof blown off barn, collapsed green-houses and minor damage to a house on Wild Branch road.	\$25,000

7/4/2012	Thunderstorm wind	55 kts	A moderately strong upper level disturbance ahead of a surface cold front moved across southern Quebec during the afternoon and evening hours of July 4th. These disturbances moved into a warm and unstable air mass and developed thunderstorms in southern Quebec, which moved across northeast Vermont during the afternoon hours and the Champlain Valley during the evening. Both episodes contained widespread wind damage and frequent lightning. Farmstand overturned and other damage in Craftsbury Common.	\$20,000
11/01/2019	Strong Wind	48 kts	Strong winds with wind gusts in excess of 50 mph at times caused numerous downed tree limbs and subsequent power outages. Also, due to saturated soils many trees were uprooted as well, leading to closed roads and some structural damage. <i>(Note: This event resulted in FEMA Disaster Declaration 4474, and Craftsbury received public assistance funds. See Section 2.2 Flooding)</i>	\$75,000
9/17/1999	High Wind	--	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Approximately 10,000 people were without power. Trees were blown down blocking many area roads. Many schools were closed with numerous area events cancelled. The strong wind caused structural damage to a house in Craftsbury. <i>[Note: this event resulting in a federal disaster declaration 1307, and the Town received \$6,795 in public assistance for damage to roads due to flooding.]</i>	\$100,000

Table 2B.3.3: Wind Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Downed trees, downed power lines, extended power outages; potential for injuries from falling debris or power lines; disruption to services and businesses	Microburst on 5/17/14 with winds approaching 65 kts	Trees lost, roads blocked, power outages, structural damage to houses and farm structures, and automobile	<b>Highly Likely:</b> > 75% in any given year



#### 4. Severe Winter Conditions (Cold, Snow, and Ice)

Winter weather often results in temporary road closures, school and business delays, and even power outages. Given the high amount of snowfall this region experiences, the town and residents are generally well prepared to deal with normal winter weather conditions. Severe winter storms, however, have been shown to affect the entire region resulting in:

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Cold, Snow, and Ice**

- Extensive damage to above-ground power and utility lines and extended power outages (as what happened in the ice storm of 1998);
- Road shutdowns, making general travel, transport, and emergency vehicle access difficult;
- Shutdown of schools, businesses, and local government services, limiting access to goods and services;
- Structural failure from excessive snow loading, especially barns (as in the storm of 2007);
- Injuries and fatalities from poor driving conditions, frostbite, hypothermia, heart attacks from overexertion, and carbon monoxide poisoning from blocked vents.

Severe winter weather affects the entire planning area. According to the *2018 Vermont State All-Hazards Mitigation Plan*: “Severe winter storms develop through the combination of multiple meteorological factors. In Vermont and the northeastern United States, these factors include the moisture content of the air, direction of airflow, collision of warm air masses coming up from the Gulf Coast, and cold air moving southward from the Arctic. Significant accumulations of ice can cause hazardous conditions for travel, weigh down trees and power lines, and cause power outages. Freezing rain can also be combined with snowfall, hiding ice accumulation and further hindering travel, or with mixed precipitation and potentially ice jams or flooding.”

The National Weather Service (NWS) has a new prediction tool (still in prototype) called the Winter Storm Severity Index. The purpose of this tool is to provide National Weather Service (NWS) partners and the public with an indication of the level of winter precipitation (snow and ice) severity and its potential related societal impacts. The WSSI does not depict official warnings and should always be used in context with official NWS forecasts and warnings.

*Table 2B.4.1 NWS Winter Storm Severity Index (Prototype)*

WSSI Descriptor	General Description of Expected Storm Severity Impacts
None	No snow or ice forecast. No potential for ground blizzard conditions.
Limited	Small accumulations of snow or ice forecast. Minimal impacts, if any, expected. In general, society goes about their normal routine.
Minor	Roughly equates to NWS Advisory Level criteria. Minor disruptions, primarily to those who were not prepared. None to minimal recovery time needed.
Moderate	Roughly equates to NWS Warning Level criteria. Definite impacts to those with little preparation. Perhaps a day or two of recovery time for snow and/or ice accumulation events.
Major	Significant impacts, even with preparation. Typically several days recovery time for snow and/or ice accumulation events.
Extreme Historic	Widespread severe impacts. Many days to at least a week of recovery needed for snow and/or ice accumulation events.

Any given storm will have different levels of impact from these individual components.

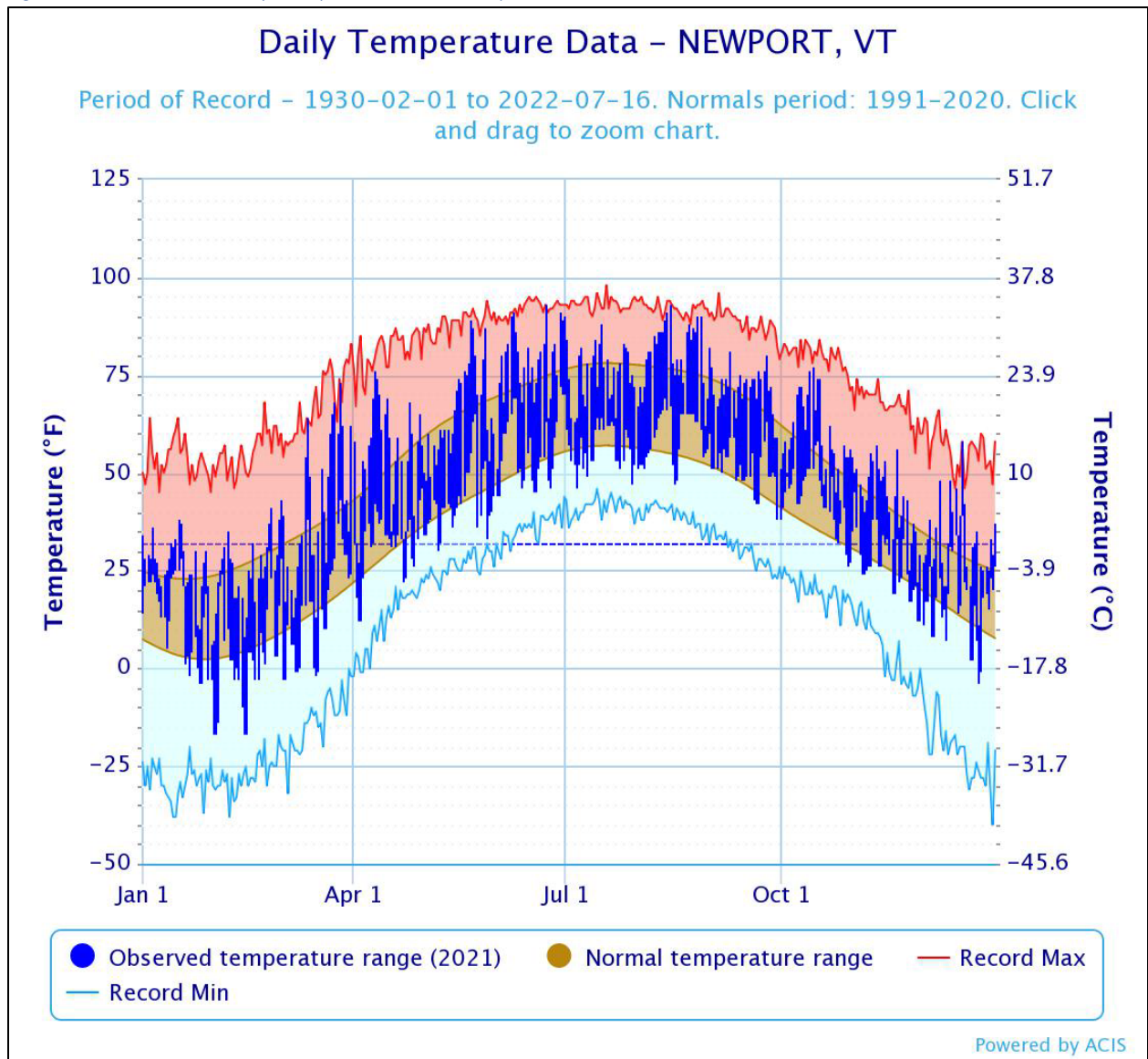
- Snow Amount
- Snow Load

- Ice Accumulation
- Blowing Snow Index
- Ground Blizzard
- Flash Freeze

*Cold*

Figure 2B.4.1 depicts historic winter temperatures in the area (Newport, which has the most complete historic data records) to the present. The blue bars illustrate the observed temperatures for 2021, juxtaposed with the normal temperature ranges from 1990-2021 shaded in brown. Historic highs (red) and lows (blue) for each day are also shown, with records going back to 1930. The coldest temperature on record is -40° on December 30, 1933, although wind chill factors have probably approached or even exceeded that benchmark on occasion.

Figure 2B.4.1: Historic Daily Temperatures 1930 to present.



Source: NowData (National Weather Service)

“Cold” and “extreme cold” have relative meanings for different parts of the country, but sub-zero temperatures are considered extremely cold in northern Vermont. According to National Weather Service data from the past 30 years, sub-zero temperatures in the area usually occur between December and March.

Table 2B.4.2: First and Last Sub-Zero Temperatures in Orleans County (Newport), 1990-present

	First Date	Last Date
Mean	December 14	March 10
Earliest	November 14 (2019)	February 6 (2010)
Latest	January 17 (2007)	March 26 (2014)

Extreme cold is likely to impact everyone town-wide, causing moderate-to-severe impacts to infrastructure, life, and economy. Water pipes can freeze or burst, and car batteries can die. Extreme cold can disrupt outdoor recreation. Unseasonably cold temperatures can damage agricultural crops.

The NOAA Storm Events Database has seven extreme cold/chill events for Orleans County going back to 2007. There are no reports of deaths or injuries, nor are there estimates for damage. However, eight respondents to the Craftsbury Hazard Mitigation Survey indicated they had been adversely impacted by extreme cold in the past ten years, and one respondent alluded to burst pipes and flooding in their home.

Table 2B.4.3 Extreme Cold in Orleans County, 2007 to present

Date	Description
01/25/2007	An arctic cold front moved across Vermont on the 24th and delivered very cold temperatures of zero to -25° by the morning of the 25th. However, on the night of the 25th into the morning of the 26th, a secondary cold front combined with a strengthening area of low pressure near New Brunswick accounted for the combination of brisk northwest winds of 10 to 15 mph and temperatures -5° to -20°, for wind chill readings of -25° to -40°. Morning lows recorded on the 25 <sup>th</sup> were -15° in Greensboro and -14° in East Albany.
03/06/2007	An arctic cold front swept across Vermont during the afternoon and evening of the 5th and delivered frigid temperatures along with blustery winds. Temperatures plummeted to below zero just after midnight on the 6th and were -5° to -20° by dawn. These frigid temperatures, accompanied by winds of 15 to 30 mph created dangerously cold wind chills of -20° to -40°. Brisk winds with temperatures around zero continued through the daylight hours of the 6th with wind chill readings from -20° to -30°. The winds subsided after sunset on the 6 <sup>th</sup> , but it remained extremely cold through the morning of the 7 <sup>th</sup> . Morning low on the 9 <sup>th</sup> was -18° in East Albany.
03/09/2007	Arctic high pressure settled across New England during the night of the 8th and morning of the 9th with more frigid temperatures similar to a few days earlier across Vermont. Morning low on the 6 <sup>th</sup> was -20° in East Albany.
01/14/2009	An arctic cold front moved across Vermont during the early morning hours of January 14 <sup>th</sup> , which delivered some of the coldest temperatures across the region in several years. As the arctic front passed across northern Vermont, temperatures dropped over 20 degrees within several hours. Temperatures averaged 20 to 25 degrees below normal values, which were already at climatological winter minimums. These extremely cold temperatures led to numerous cold weather-related problems including numerous dead vehicle batteries and broken home and business water pipes. Morning lows for January 15 <sup>th</sup> were -24° in North Troy, -21° in Morrisville, and -20° in Newport.
01/07/2015	An arctic cold front pushed across Vermont during the afternoon hours of January 7th with plummeting temperatures and brisk, strong winds (15 to 30+ mph) causing dangerously cold wind chills of -25° to -40° during the evening of January 7th into the morning hours of

	January 8th. These dangerously cold wind chills led to delayed school openings or cancelled classes on the morning of January 8th. Morning low on the 8 <sup>th</sup> was -28° in Greensboro.
01/11/2022	Arctic high pressure moving from central Canada across the Great Lakes into the northeast on January 11th. Brisk northwest winds of 10 to 20 mph delivered sub-zero air temperatures that combined created apparent temperatures (wind chill) in the -20° to -35° range across north-central and northeast VT and higher elevations. Numerous school districts closed school and after-school activities due to the cold and COVID-related complications.
01/14/2022	An arctic cold front moved across VT with a strong area of high pressure across south-central Canada building into VT by late Saturday into Sunday, delivering sub-zero temperatures Friday night through Sunday morning. Simultaneously, a powerful ocean storm was moving into Newfoundland Canada Friday afternoon that created brisk north-northwest winds of 15 to 25 mph with higher gusts that, combined with the arctic airmass, created dangerously cold wind chills of -25° to -40° overnight Friday night into Saturday morning. Overnight air temperatures were -10° to -20° Friday night-Saturday morning and -10° to -25° Saturday night-Sunday morning. These dangerously cold temperatures caused some postponements of outdoor activities, including festivals and some ski resorts.

Those who are especially vulnerable to the impacts of extreme cold are residents in older structures and energy-burdened households. According to most recent American Community Survey 5-year estimates (2020), more than a third of Craftsbury housing units (38%) are at least 50 years old. Older structures are likely to be “leaky” and poorly insulated, which can nearly double average heating energy use. Heating challenges are further exacerbated by energy burden, which is measured as energy spending as a percentage of income. Energy burden, according to a 2019 study by Efficiency Vermont, is high in the rural Northeast Kingdom. While the average energy burden statewide is about 10%, Craftsbury’s overall energy burden is considered “moderate” at 10.7%. The greatest determinant of energy burden is income, not fuel cost, so even though many residents are able to reduce their costs by burning wood, they still struggle to make ends meet.<sup>4</sup> Craftsbury has a very active local energy committee which can help raise awareness of low- or no-cost home weatherization services, such as HEAT Squad and Northeast Employment and Training. The committee also helps to distribute firewood to those in need.

Structure fires are a vulnerability of extreme cold since fires are more likely to occur during the winter heating months. According to FEMA, Vermont’s crude death rate (per million in population) of 17.6 is well above the national crude rate of 11.2. These rates should be viewed with caution, since they are based on very small numbers of actual deaths. Nevertheless, the relative risk of fire in Vermont is 1.6, still slightly above the overall national risk of 1.0.<sup>5</sup> The age of Craftsbury’s housing stock as well as its dispersed settlement pattern may be complicating factors. Residents living in remote areas accessible by class 4 roads may face a delayed response time for emergency vehicles.

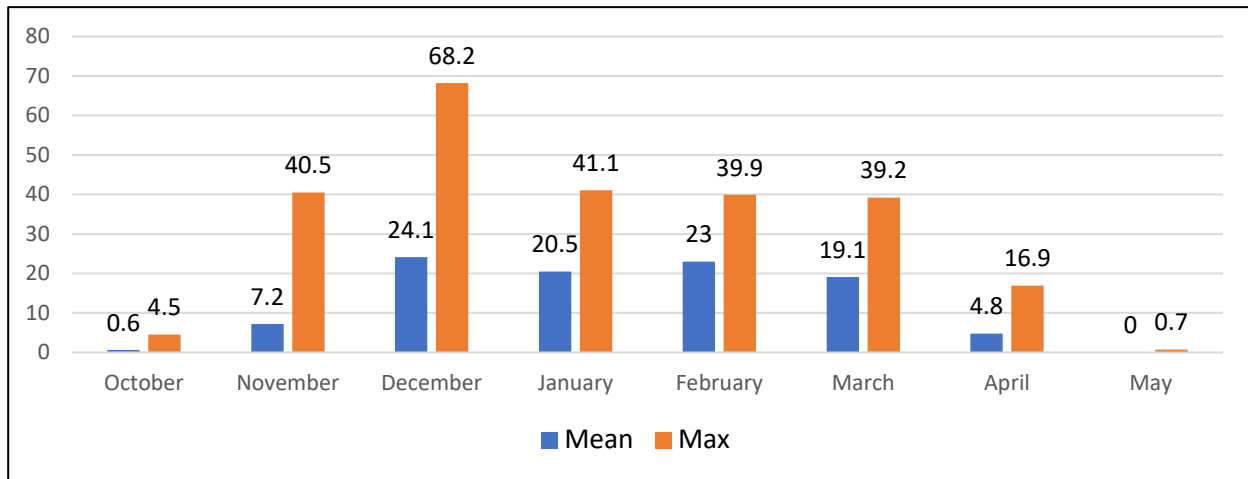
#### *Snow*

In general Craftsbury residents and business owners are accustomed to snow and businesses are unlikely to shut down because of heavy snowfall. The likeliest moderate-to-severe impacts to infrastructure would be short term because roadways are not passable during a storm. Heavy snow accumulations have caused barn roofs in Craftsbury to collapse in the past.

<sup>4</sup> Efficiency Vermont: 2019 Energy Burden Report <https://www.efficiencyvermont.com/news-blog/whitepapers/vermont-energy-burden>

<sup>5</sup> FEMA: Fire in the United States, 2008-2017, November 2019, 20<sup>th</sup> Edition. <https://www.usfa.fema.gov/downloads/pdf/publications/fius20th.pdf>

Figure 2B.4.2 Monthly Total Snowfall for Orleans County (Newport)



Source: NOWData, NOAA

Orleans County’s snow season can extend from October through May, with the heaviest monthly snow accumulations in December. The heaviest total monthly accumulation is December but the biggest snowstorms tend to occur in February/early March. The mean average snowfall for the entire season (from 1990-2000 through 2021-2022) is 98.4”.

The nearest most complete data on snowfall and accumulation is in Newport. The mean number of days per year with more than 1” snow cover is 128 days. The maximum number of days with snow cover was in 1972 at 161 days, and the minimum was in 2010 with 95 days.

Historic data on snowfall in Newport have gaps, but the existing data suggests a downward trend in the annual snow cover. This trend is consistent with statewide data and loss of snow cover, which can be attributed to rising temperatures. Reductions in snow fall may leave exposed ground more vulnerable to freezing during extreme cold events, which can cause significant impacts to building infrastructure. The loss of snow cover could have a devastating economic impact in Craftsbury, which relies heavily on all-season outdoor recreation. In the past winter the Craftsbury Outdoor Center had to cancel a skiing competition. An early snow melt contributed to a very challenging mud season.

According to the NOAA database, the record snowfall extreme for Orleans County occurred on February 5-6, 1995, in Jay Peak with 1-day, 2-day, and 3-day totals of 42”, 48” and 48” respectively.

"Heavy Snow," according to the National Weather Service, is snowfall accumulating to 4 inches or more in depth in 12 hours or less; or snowfall accumulating to 6 inches or more in depth in 24 hours or less. The NOAA Storm Event database records five heavy snow events in Orleans County from January 1, 2000 through January 31, 2022. There were no direct injuries or deaths, but all events incurred property damage:

Table 2B.4.4: Heavy Snow Events

Date	Description	Total Property Damage
1/24/2002	A cold front moved across the area with snow squalls reported across northern Vermont. Generally, 3 to 5 inches fell with the heavier squalls.	\$1,000
2/27/2002	A cold front moved across the area accompanied by and followed by snow squalls. In addition, an ocean storm spread moisture into the region. Generally between 3 and 6 inches of snow fell in the hilly terrain, with a few locally higher amounts. East Albany received 5.5”.	\$1,000

2/14/2007	Snow fell heavy at times from late morning through early afternoon in southern Vermont and early afternoon through early evening elsewhere, before dissipating during the night. Snowfall rates of 2" to 4" per hour and brisk winds of 15 to 25 mph caused near whiteout conditions at times, along with considerable blowing and drifting of the snow, making roads nearly impassable. Further, temperatures in the single numbers above zero combined with these brisk winds created wind chill values of -10° or colder. Snowfall totals ranged from 15" to 25" in the Connecticut river valley to 20" to 35" elsewhere across Vermont. Greensboro received 19". The deep snowfall caused numerous problems, including the blocking of numerous heat vents that resulted in the build-up of carbon monoxide and sent dozens of people seeking treatment at area hospitals. There were additional indirect injuries resulting from this storm, including vehicle accidents and cardiac arrests due to overexertion during snow removal. Snow removal operations took several days and up to a week in some urban communities. In addition, the weight of the heavy snowfall on some weaker roofs resulted in the partial or total collapse of 20 or more barn roofs and the deaths of more than 100 cattle.	\$200,000
2/05/2014	The combination of low pressure from the Gulf of Mexico that moved into the Ohio River valley on the night of February 4th and a developing coastal low that moved south of New England on February 5th delivered widespread snowfall to Vermont on February 5th. A widespread 5" to 12" of snow fell across Vermont with the higher totals in the central and southern Green Mountain communities. Snowfall was at its peak during both the morning and afternoon/evening commutes causing hazardous travel. Six to ten inches of snow fell across Orleans County.	\$10,000
2/13/2014	A winter storm responsible for record ice and snow across the southeast United States on February 12th moved and redeveloped off the southeast US coastline on February 13th. This storm intensified as it hugged the eastern seaboard on February 13th, moved across southeast Massachusetts and into the Gulf of Maine by February 14th. Snow began to overspread southern Vermont during the mid-morning hours of February 13th, not reaching the Canadian border until the evening commute. There were two bands of heavy snowfall, snowfall rates of 1-2+ inches an hour, that moved across the region. The first band moved across southern and eastern Vermont during the afternoon hours of February 13th and again during the early morning hours of February 14th. Craftsbury received 13".	\$15,000
2/02/2015	A storm system moved from the Desert Southwest on Saturday (1/31) to the Mississippi Valley on Sunday (2/1) and across the Ohio River Valley and south of New England on Monday (2/2). This brought snowfall across Vermont during the early morning hours and continued into the late afternoon. A widespread 6" to 12" of snow fell across the region and it was cold with temperatures only near zero degrees. Greensboro recorded 10". <i>[Note: This was FEMA disaster declaration 4207, and the Town of Craftsbury received \$12,136 in public assistance.]</i>	\$15,000

NOAA defines a *winter storm* as an event that has one significant winter weather hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or



exceeds locally/regionally defined 12 and/or 24 hour warning criteria for at least one of the precipitation elements.

Orleans County has 104 winter storm events reported in the NOAA Storm Events database from January 1, 2000 to January 31, 2022. Winter storm events with notably heavy snow accumulations are:

*Table 2B.4.5: Winter Storms with Heavy Snow Accumulations*

Date	Description	Total Property Damage
2/06/2001	10" snow reported in neighboring Greensboro. Barn roofs collapsed in Craftsbury and Holland, apparently due to the weight of snow after the storm ended.	\$75,000
03/05/2001	19" reported in Newport. Snow didn't taper off until March 6. FEMA disaster declaration EM-3167 provided \$4,359 in assistance to the Town of Craftsbury for snow removal.	\$75,000
10/25/2005	Steady rain on the 25th of October changed to snow by early afternoon in the higher terrain counties of Vermont. The snow was very wet and became heavy at times, accompanied by gusty winds. With foliage still on the trees, the weight of the snow easily took many trees and tree limbs down with extensive power outages. Thousands were without power. A local radio station in Derby was off the air due to power outages. Numerous accidents were reported. Some schools were closed on the 26th. By the evening of the 25th the impact of the storm was clearly being felt with 4" to 6" snowfall. Total snow accumulations in this area were 8" to 18" with lesser amounts in the sheltered valleys. Barton (Orleans county) reported 16.5", while Cambridge (Lamoille county) received 14".	\$100,000
12/09/2014	The heavy, wet nature of the snowfall with snow to water ratios of 8:1 or less accounted for snow-loaded trees that resulted in more than 175,000 power outages in the region from December 9th through December 12th. This was the 2nd most power outages due to weather in the state of Vermont. 15" of snow reported in Greensboro.	\$150,000
11/26/2018	Light rain changed to a pasty, heavy wet snow that resulted in downed tree limbs and power outages across VT. Snow accumulation was 18" in Greensboro. The heavy wet snow accounted for more than 40,000 outages, leaving 100,000 customers without power due to snow loading on power lines.	\$100,000

*Ice*

Ice accumulation is becoming a regular concern for winter weather, especially with rapidly fluctuating temperatures in winter months. Ice accumulation can lead to moderate to severe community-scale damage to infrastructure and economy, which includes downed trees and power lines, dangerous roadways, and extensive power outages that lead to closure of schools, services, and businesses. Craftsbury's local economy relies heavily on outdoor recreation, and ice accumulation can be extremely disruptive. Ice accumulated can also lead to isolated but moderate to severe impacts to trees and plant life. Six respondents to the Craftsbury Hazard Mitigation Survey indicated they had experienced adverse impacts from ice in the past ten years, although respondents did not specify details.

The Vermont State Hazard Mitigation Plan considers ice to have greater impacts than hazards associated with snow. Our warming winters can lead to prolonged patterns of melting and refreezing, not to mention wintry mix of freezing precipitation. Pre-storm road temperatures and surface conditions affect the potential for ice accumulation on roads and walkways. Roads and walkways washed clear of salt and sand by rain, for example, are more likely to form ice. Subsequent snow accumulation can hide the icy layer beneath. A search of NOAA winter storm records reveals that ice accumulation was involved in 16 of Orleans County’s 104 winter storm events. Impacts were treacherous driving conditions leading to road accidents, as well as accumulation on powerlines leading to significant and prolonged power outages.

According to the NOAA Storm Event database, Craftsbury has experienced two significant ice storms. Both resulted in federal disaster declarations.

Table 2B.4.6: Ice Storms in Orleans County

Date	Description
1/06/1998	<p>A storm system moved from the Tennessee Valley on Wednesday (January 7) and Thursday (January 8) into New England thereafter. A cold front across New England and New York associated with an arctic high-pressure system across Canada resulted in a flow of low-level cold air into Vermont. Warm moist air riding over this low-level cold air resulted in icing across portions of this area. Significant icing was generally restricted between 1500- and 2500-foot level.</p> <p>Ice accumulations during this event were generally 1/4” or less. The impact on the region ranged from ice accumulations damaging tens of thousands of trees. Downed power lines resulted from the weight of the ice, leaving thousands without power. Farmers who lost electricity were unable to milk cows with loss of income and damage to cows. Automobile travel was negatively impacted with several roads closed due to ice and fallen trees. There were numerous traffic accidents. Indirect injuries were reported due to carbon monoxide poisoning while improperly using generators. Falling tree limbs and other debris was a significant hazard during and following the storm. \$80,000 reported in damages. [Note: This was FEMA Disaster Declaration 1201.]</p>
12/21/2013	<p>A stationary boundary was draped across the Adirondacks of New York into portions of central and northern New England from December 20th through 22nd with several disturbances delivering precipitation. An impressive battle between mild to warm moist air, south of the boundary with temperatures in the 50s, overriding a very cold, dense shallow air mass with temperatures in the teens and 20s in northwest Vermont but single digits just north across the border into Canada. First round of wintry precipitation fell across northwest Vermont, especially along the Canadian border during Friday afternoon and evening (December 20th). Most of the precipitation fell as freezing rain, approximately 1/4” to 1/3” of ice accumulation, along with some sleet. The second round began during the early afternoon hours of December 21st and peaked during the evening and overnight hours. An additional ½” to ¾” inch of ice accumulation as well as 1” to 2” inches of sleet occurred in portions of northern Vermont. Very cold temperatures (-10° to teens) followed the event with no melting, thus ice stayed on trees and utility lines through December 28th-29th, prolonging recovering efforts. The greatest impact was in northwest Vermont, especially along the Canadian border, with widespread tree and utility line damage as well as numerous vehicle accidents. More than 75,000 customers were without power from hours to days across the region. The areas impacted were similar to the Ice Storm of January 1998, but not the severity, as precipitation and ice accumulation were half of the 1998 storm. Ice jams also developed during this time period as runoff from melting snow and rainfall swelled area rivers. River rises were enough to break up and move</p>



	ice cover, resulting in scattered ice jams. [Note: This was FEMA Disaster Declaration 4163.]
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Table 2B.4.7: Severe Winter Conditions Hazard Summary Table

Hazard	Location	Vulnerability	Extent	Observed Impact	Probability
Cold	Town-wide	People living in older structures; energy burdened households Structure fires Damage to water pipes Damage to agricultural crops	-40° recorded on December 30, 1933	Burst water pipes and flooding; school cancellations and delays; outdoor recreation events cancelled	<b>Highly Likely:</b> > 75% in any given year
Snow	Town-wide	Roofs prone to collapse from weight; Power lines and trees; impassable roads due to snow drifts; indirect injuries from overexertion	February 5-6, 1995, county wide extreme snow fall, with 1-day, 2-day, and 3-day totals of 42", 48" and 48" respectively. (Jay Peak); 19 inches recorded in neighboring Greensboro on 2/14/2014	Two barn roof collapses; \$4,359 in snow removal assistance from FEMA; power outages	<b>Highly Likely:</b> > 75% in any given year
Ice	Town-wide	Road accidents, downed tree limbs, powerlines	1998 ice storm	Extended power outages; lost income from dairy operations; road accidents; carbon monoxide from improper use of generators.	<b>Highly Likely:</b> > 75% in any given year

## 5. Wildfire

Although wildfires are relatively uncommon in Vermont, they have potential for moderate to severe community-scale damage to town infrastructure, personal safety, as well as loss of wildlife and wildlife habitat. Wildfires can also have moderate to severe damage to economic operations, such as outdoor recreation and forestry.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Wildfire**

The risk for wildfire is usually greatest in the spring, shortly after snowmelt extending into the beginning of June. During this period weather conditions are favorable for drying wildland fuels, dead grasses, leaves and twigs. Low humidity and gusting winds, combined with dry wildland fuels, can make controlling a wildfire difficult and dangerous. Hot and dry conditions in the summer can also elevate

wildfire risk. Campfires, logging operations, and even lightning strikes can cause a summer fire. In the fall, after leaf drop, warm and dry conditions and a delayed snowfall can raise the risk of wildfire as well.

Fire danger ratings are determined by forest fuel conditions, recent weather conditions, and various fire start risk factors. During non-snow periods of the year, the Department of Forests, Parks and Recreation monitors forest fire danger levels daily. Open burning is regulated in every town in Vermont and Town forest fire wardens are responsible for issuing open burning permits, if fuel and weather conditions are safe for outdoor burning. Fire wardens have the authority to ban open burning in their towns during times of high fire danger or hazardous local conditions. Unfortunately, routine disregard of open burning regulations contribute to the risk.

Extended periods of warming due to climate change, combined with an extended period of drought conditions and an early snowmelt, have raised the risk of wildfire. In Richmond, approximately two acres burned in early May 2022. Several acres burned in Putney, and two to three acres of woodland burned in Rochester, resulting in a fatality. In New Hampshire, 250 acres burned in Crawford Notch State Park, and in June a bullet in a firing range sparked a grassland fire. While no respondents to the Craftsbury Hazard Mitigation Survey were adversely impacted by a wildfire in the past ten years, respondents were concerned about future events. Fourteen respondents were mildly concerned about future wildfires, and eight respondents were very concerned.

Table 2B.5.1: Wildfire Hazard Summary Table

Location	Vulnerability	Extent/Observed Impact	Likelihood/Probability
Townwide (town is 75% forested)	Early snow melt; drought conditions, dry, gusting winds	Occasional brush fires, but no history of wildfire in Craftsbury.	<b>Likely:</b> >10% but < 75% in any year; at least one chance in next 10 years

## 6. Drought

Drought is defined as a shortage of water relative to need. According to the Vermont 2018 Hazard Mitigation Plan, drought is a complex phenomenon for several reasons:

- It is difficult to monitor and assess because it develops slowly and covers extensive areas, as opposed to other disasters that have rapid onsets and obvious destruction.
- The effects of drought can linger long after the drought has ended.
- Drought is an inherent, cyclical component of natural climatic variability and can occur at any place at any time, making it difficult to determine the onset, duration, intensity, and severity, all of which affect the consequences and corresponding mitigation techniques.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Drought**

Extended periods of drought during a Vermont growing season can be devastating for agriculture. USDA data show occasional payouts from crop insurance due to drought damage, but this data is at the county level, so it is not possible to determine if these losses occurred in Craftsbury. Furthermore, not all local growers carry crop insurance. Forestry operations are susceptible to drought as well, because extended warm and dry seasons can increase risk of disease. Drought also weakens or kills wildlife, and the dieback of vegetation and increased risk of wildfire destroys habitat.

Drought can also result in loss of potable water when wells run dry. Although the surface waters may appear to have recovered from a period of drought following a return to normal precipitation, replenishing groundwater levels is a longer process. Low water levels in wells can yield higher concentrations of metals (uranium, iron, sulfur, arsenic, and manganese) in drinking water, making the water unsafe to drink.

Drought conditions are also favorable for wildfires. Low water levels can also affect recreation and fishing. Low water levels, paired with rising temperatures, can trigger occurrence of blue-green algae in lakes and ponds.

High winds, low humidity, and extreme temperatures can all amplify the severity of the drought. The severity of a drought depends on the duration and extent of the water shortage, as well as the demands on the area’s water supply. Drought classification categories range accordingly:

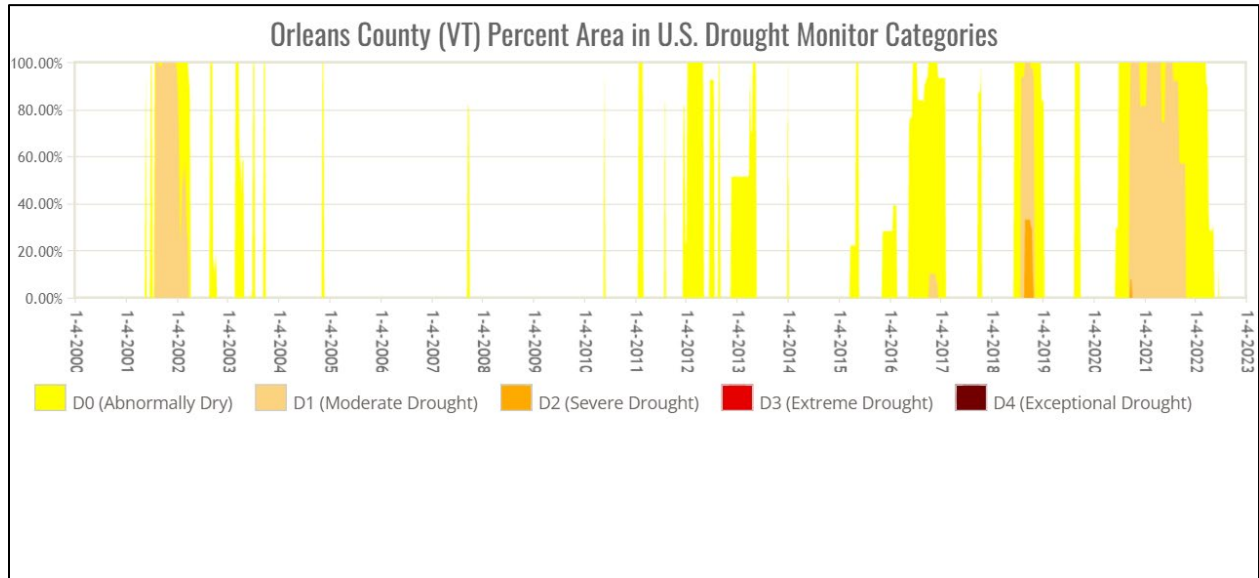
Table 2B.6.1: Drought Severity Table

Classification	Description	Possible Impacts
<b>D0</b>	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
<b>D1</b>	Moderate Drought	Some damage to crops, pastures. Streams, reservoirs, or wells low, some water shortages developing or imminent. Voluntary water-use restrictions requested.
<b>D2</b>	Severe Drought	Crop or pasture losses likely. Water shortages common Water restrictions imposed.
<b>D3</b>	Extreme Drought	Major crop/pasture losses. Widespread water shortages or restrictions.
<b>D4</b>	Exceptional Drought	Exceptional and widespread crop/pasture loss; Shortages of water in reservoirs, streams, and wells creating water emergencies.

Source: U.S. Drought Monitor <https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx>

It seems paradoxical that while climate change is generally bringing increased levels of precipitation that Vermonters should experience drought. However, climate change also is linked to climate instability and extremes. According to the US Drought Monitor, Orleans County has recently experienced the longest period of dry/drought conditions in decades (Figure 2B.6.1). All of Orleans County experienced a minimum of abnormally dry conditions (D0) from July 7, 2020 through March 28, 2022. Nearly all of Orleans County experienced moderate drought (D1) from September 22, 2020 to November 1, 2021. Minor portions of the county also experienced severe drought (D2) from September 29 to October 12 of 2020.

Figure 2B.6.1: Drought Conditions in Orleans County, 2000-Present



Source: US Drought Monitor

In late 2020, USDA Farm Services Agency issued a declaration of drought-related disaster conditions, making all Vermont farmers eligible to apply for emergency loans. With drought conditions persisting for more than a year, the State of Vermont reactivated its Drought Task Force in July 2021.

The Agency of Natural Resources maintains a crowd-sourced database called the ANR Drinking Water Drought Reporter. <https://anrmaps.vermont.gov/websites/droughtreporter/>

The database does not identify any water outages or shortages for Craftsbury, but 11 respondents to the survey indicated they had been affected by drought in the past 10 years. Two survey respondents cited impacts to their wells. Moreover, 21 respondents were “mildly concerned,” and 16 respondents were “very concerned” about future impacts from drought.

Table 2B.6.2: Drought Risk Summary Table

Type	Location	Vulnerability	Extent	Observed Impact	Likelihood/Probability
Drought	Townwide	Crop damage, loss of drinking water, unsafe drinking water, higher occurrence of algae blooms, increased risk of wildfire	2+ years of abnormally dry/moderate drought conditions countywide	Well ran dry, water level in another well with arsenic results.	Likely: >10% but < 75% in any year

## 7. Invasive Species

Invasive species are defined as plants, insects, and other organisms that were either accidentally or intentionally introduced from other place and that can negatively impact agriculture, recreation, forestry, human health, the environment, and the economy. Invasive plants, which are categorized as either terrestrial or aquatic, can cause environmental devastation by changing soil composition, changing water tables, and disrupting insect cycles. They often lack food value upon which wildlife depends. Invasive animals can threaten biodiversity by preying upon native species or out-competing for food and nutrients.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Invasive Species**

Human activity can contribute to the spread of invasive species. Non-native insects, for example, can inadvertently get transported into the region via wooden shipping crates or firewood. Aquatic invasives can be introduced on boats, either in the ballast water or on the hull. Landscaping and cultivating can spread invasives as well, as is the case with garlic mustard and Japanese knotweed, and these plants can readily establish a monoculture. Invasive species do not, by their nature, have boundaries. This concept was clearly demonstrated during Tropical Storm Irene, when floodwaters uprooted Japanese knotweed plants along Vermont’s waterways. Years later, the fight to eradicate the knotweed has become even more protracted as it spreads along streambanks and areas beyond, choking out native plant communities and destabilizing banks.

Climate change significantly contributes to the spread of invasives. For example, warmer temperatures weaken native species such as maple, yellow birch, and American Beech while allowing forest pests such as the hemlock woolly adelgid to overwinter and reproduce. Respondents to the Craftsbury Hazard Mitigation Survey cited Invasive Species to be the second greatest concern for future hazards: 26 respondents indicated that they had already experienced adverse impacts from invasives, and 44 respondents voiced concern about future impacts (22 “mildly concerned” and 19 “very concerned”).

Education and outreach are critical to the effective management of invasives. Fortunately, Craftsbury has an active Conservation Commission that is leading efforts to increase awareness. Several respondents to the Craftsbury Hazard Mitigation Survey identified specific invasive species, and their unusually high level of awareness may be due to the ongoing work in the Conservation Commission.

*Table 2B.7.1: Invasive Species Identified in Craftsbury by Survey Respondents and Town Plan\**

Species	Description
Japanese knotweed	Found in wet habitats, along river and stream banks, and in disturbed areas, such as roadsides. In VT, knotweed covers miles of shoreline on every major river in the state. Mechanical control methods include repeated cuttings, as well as wire fencing laid horizontally on the ground over a patch.
Eurasian Milfoil	Displaces and reduces the diversity of native aquatic plants, providing less value as food source for water fowl. Present in Great Hosmer and Eligo. Once established, it’s impossible to eradicate. To manage the spread, avoid boating through infestation areas and check and wash down watercraft after hauling out.
Buckthorn, common and glossy	Invades forests and can form dense thickets crowding out native shrubs and understory plants. Increases nitrogen level in soil, which changes conditions for other plants. Invades wet habitats as well, which can destabilize streambanks. Smaller plants can be pulled by hand. Larger plants require cutting and possibly a weed wrench. Hang from a branch to prevent re-rooting.
Asiatic bittersweet	Fast-growing vines encircle trees, slowly killing them. Can be managed through careful hand pulling and entire removal of plant. Plants should be bagged before disposing.

Wild chervil & Wild Parsnip	Found along roads but will spread into fields and their shaded fringes. Seeds are spread by mowers and wind over great distances. The plant's sap can burn skin. Can be managed by carefully timed mowing, before the seed can reduce their spread. Pulling requires protective layers, such as gloves and long sleeves.
Burning bush	Spreads from yards to forests and fields after birds consume the seeds. Outcompetes native species. Can be managed by careful hand pulling. Hang from a branch to prevent re-rooting.
Purple loosestrife	Grows in a variety of wet habitats. Invades wetlands and alters their ecological function. Prolonged flooding will kill the plants – but will destroy other plants as well. European beetles, which are available as a biocontrol, feed on loosestrife and can help reduce their density.
Goutweed	Forms dense patches through rhizomes, replacing other vegetation. Common in residential areas, they can establish in forests, forest edges, streambanks, meadows, as well as disturbed areas. Smaller patches can be managed through persistent pulling. Bag the rhizomes before disposal. Frequent mowing can control or slow the spread.
Common reed	Found in disturbed habitats, brackish or salt marshes and flats, fens, fresh tidal marshes or flats, marshes, shores of rivers or lakes, wetland edges. Replaces native grasses, providing poor habitat for insects, birds, and amphibians. Can be managed through CAREFULLY timed cutting, smothering.
Japanese Honeysuckle	Thrives in a variety of habitats, including fields, dense forests, and wetlands. Can girdle and kill young trees and shrubs and kills other plants by blocking sunlight. Small patches may be managed by hand pulling. Larger patches require repeated mowing and herbicide.

\*This list does not include species on the watch list which may have invasive tendencies but are not prohibited (e.g. Spindle Tree )

Vermont Invasives ([www.vermontinvasives.org](http://www.vermontinvasives.org)) is an educational resource created by the State of Vermont and the University of Vermont Extension. The site identifies three non-native insects which currently threaten Vermont: the emerald ash borer (EAB), Asian long-horned beetle (ALB) and hemlock woolly adelgid (HWA). These three pests threaten more than 14 different species of trees in Vermont, including maple, elm, horse chestnut, willow, ash, poplar, European mountain ash, hackberry, and hemlock. The Emerald Ash Borer (EAB) burrows through the ash tree's inner bark, depriving the tree of water and nutrients. A healthy tree infested by EAB can die within one to four years. Ash trees account for about 5% of the state's forest composition, and most are expected to die, resulting in safety hazards from falling trees, loss of tree cover (and loss of capacity to sequester carbon), and riverine debris in high water and flooding events. EAB was identified in neighboring Caledonia County back in 2017, and in Derby Line in Orleans County in 2019, so its arrival in Craftsbury is imminent. An ad hoc committee in Craftsbury is currently studying the extent of trees in public rights of way that may be downed by EAB.

The Vermont Department of Fish and Wildlife property next to the Little Hosmer boat launch has been designated as a Japanese Knotweed Demonstration Area, and the Craftsbury Conservation Commission has been documenting the occurrence of the invasive plant and implementing several control methods. This infestation at the demonstration site is a prime example of the hazards associated with invasive plants - the soils are unstable leading to potential washout. In 2014, the Conservation Commission documented knotweed infestation along the Black River.

Table 2B.7.2: Invasive Species Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town wide, with habitats specific to individual species, such as roadways, wetlands, forests.	Forests, agriculture, waterways, native species; risk of downed trees in public rights of way.	Eurasian milfoil in Great Hosmer and Eligo, Japanese Knotweed at Little Hosmer and along major waterways,	Compromised natural habitat, including streambanks and forests. Compromised soil	<b>Highly Likely:</b> > 75% in any given year

		including Black River. Invasives identified in table 2B.7.1 by residents and Conservation Commission.	stability along waterways.	
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## 8. Hail

Hailstorms usually occur in Vermont during the summer months and typically accompany passing thunderstorms, when updrafts carry raindrops into extremely cold areas of a cloud. The raindrops form into chunks of ice known as hailstones. The size of the hailstone is directly related to the severity and strength of the thunderstorm. As long as the ice is continually pushed back into the cold areas, it continues to hit water droplets, which then freeze to the hailstone, adding another layer of ice. The ice accumulations continue until the hailstones become too heavy to remain in the cloud, or the updraft slows down.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Hail**

Hailstorms occur infrequently in Vermont and it is not clear that climate change will increase their frequency. The NOAA Storm Events Database reports 44 hail events in Orleans County since 1964, but because hailstorms tend to be extremely localized only events reported in Craftsbury are included here.

*Table 2B.8.1: Hail Events in Craftsbury*

Date	Size of hail	Description	Total Property/Crop Damage Reported
9/06/1998	1"	A cold front moved southeast from Canada across Vermont during the night of Sunday, September 6th and triggered thunderstorms. Locally strong winds and large hail accompanied a few of the storms. One inch hail fell in Craftsbury. In Albany, strong winds moved a trailer off its foundation and a shed was destroyed. In Greensboro, trees and power lines were blown down.	--
08/07/2006	.75"	A relatively strong westerly low-level flow interacted with a moderately unstable airmass across northern New York and northern Vermont on the afternoon of the 7th. The end result was scattered thunderstorms across the region, including a long-lived supercell structure that developed over Clinton county, New York and moved across Vermont into Orleans county. This storm brought strong winds and penny size hail to Craftsbury before proceeding into Glover with damaging winds, that knocked down trees and powerlines that blocked access to Barton along Route 16.	--
5/29/2012	1.75"	A warm front moved across Vermont in the morning hours of May 29th, leading to numerous thunderstorms with heavy rain, damaging lightning and isolated large hail and strong winds. Some of these thunderstorms deposited up to 2 inches of rainfall in portions of north-central and northeast Vermont. Golf ball-sized hail reported in Craftsbury.	\$5,000 (property)

Severity of hail is measured on the TORRO Scale, ranging from "HO-Hard Hail," with the maximum size of hailstone about the size of a pea, to "H10-Super Hailstorm," with the maximum size of the hailstone about the size of melon. However, size may not always be a reliable indicator of severity for agricultural growers, since small hailstones – especially when driven by strong winds – can easily strip crop heads.



and destroy young plants. A single hail event can wipe out an entire season’s crops. One respondent to the Craftsbury Hazard Mitigation Survey cited adverse impacts to hail, and at least one local grower could specifically attest to crop losses. USDA data show occasional payouts from crop insurance due to hail damage, but this data is at the county level, and not all local growers carry crop insurance.

Due to the unpredictability of hailstorms, there is little in the way of hail mitigation in Vermont. Structural mitigation efforts such as hail nets are not cost-effective for small growers. Most efforts related to hail are in the response and recovery sectors. In addition to crop insurance, USDA’s Farm Service Agency may on occasion provide emergency loans to growers in the event of a disaster declaration. The Vermont Farm Fund, administered by the Center for an Agricultural Economy in Hardwick, also provides emergency loans to agricultural producers.

Table 2B.8.2: Hail Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Local growers	May 29, 2019. Golf-ball sized hail reported in Mill Village.	\$5,000 in property damage associated with May 2019 event. Crop loss from a smaller hail event.	<b>Highly Likely:</b> > 75% in any given year

## 9. Heat

The Centers for Disease Control reports that more people die from heat than other weather-related events. The actual number of deaths are most likely underreported because heat can exacerbate other underlying conditions such as heart and respiratory disease, leading to death.<sup>6</sup> The impacts of extreme heat can be particularly challenging in regions such as the Northeast Kingdom where residents are not accustomed to high temperatures and are less likely to live in air-conditioned structures.

**This section of the Plan satisfies the requirements of 44 CFR §201.6(c)(2)(i) and 44 CFR §201.6(c)(2)(ii): Hazard Identification and Risk Assessment for Heat**

As a rule, the National Weather Service considers “excessive heat” to be an event when the maximum heat index is expected to be 105° or higher for at least two days and nighttime air temperatures will not drop below 75°. However, these criteria can vary widely across the county, especially in areas like Orleans County which is unaccustomed to extreme heat conditions. The primary impact of extreme heat or prolonged periods of hot weather is to human life. Hot conditions, especially when combined with sun and high humidity, can limit the body’s ability to thermoregulate properly. Prolonged exposure to hot conditions can lead to heat cramps, heat exhaustion, heat stroke, or exacerbate other pre-existing medical conditions. Some of these impacts require medical attention and can be fatal if left untreated. Children and the elderly are especially vulnerable to heat-related illnesses.

Vermonters are at greater risk for serious heat-related illnesses, and even death, when the statewide average temperature reaches 87°F or hotter.<sup>7</sup> Working with the Vermont State Climate Office, the Vermont Department of Health analyzed 14 years of temperature and mortality data, and ten years of

<sup>6</sup> Centers for Disease Control, Heat Related Illness: Picture of America Report,

<sup>7</sup> Vermont Department of Health: Heat Vulnerability in Vermont, Local Indicators of Heat Illness Risk. 2016. [https://www.healthvermont.gov/sites/default/files/documents/2016/12/ENV\\_EPHT\\_heat\\_vulnerability\\_in\\_VT\\_0.pdf](https://www.healthvermont.gov/sites/default/files/documents/2016/12/ENV_EPHT_heat_vulnerability_in_VT_0.pdf)

surveillance data for emergency department (ED) and urgent care visits. The research found that on days when the statewide average temperature reached 87°F, ED visits for heat-related illnesses such as heat exhaustion and heat stroke increased eightfold, and there was one additional death per day among individuals aged 65 and older. Deaths due to heart disease, stroke, and neurological conditions were relatively more common on these days reaching at least 87°F, as compared to cooler days.

The NOAA Event Database has no extreme heat events for Orleans County. July is traditionally the hottest month of the year in Craftsbury with the greatest number of days over 87°, but hot days can occur from May through September, with occasional outliers as early as April.

Using 87° as a standard, the hottest July on record for the East Albany area was 2018, with 10 days reaching 87° or more. (Complete records for the East Albany area only go back to 2003.) The highest temperatures recorded in the area are 88°. The nearest comprehensive analysis on hot days on a *climate scale* (three decades or more) is St. Johnsbury, and the data indicate that the number of days per year with temperatures of 87° or higher is rising. The Vermont Department of Health anticipates a statewide increase to an average of 33 days per year by end of century.<sup>8</sup> Responses from the Craftsbury Hazard Mitigation Survey align with this projection: Four respondents to the Craftsbury Hazard Mitigation Survey indicated they had been “adversely impacted” by extreme heat events, although no respondent provided details of the impacts they experienced. 29 respondents indicated a concern about future extreme heat events.

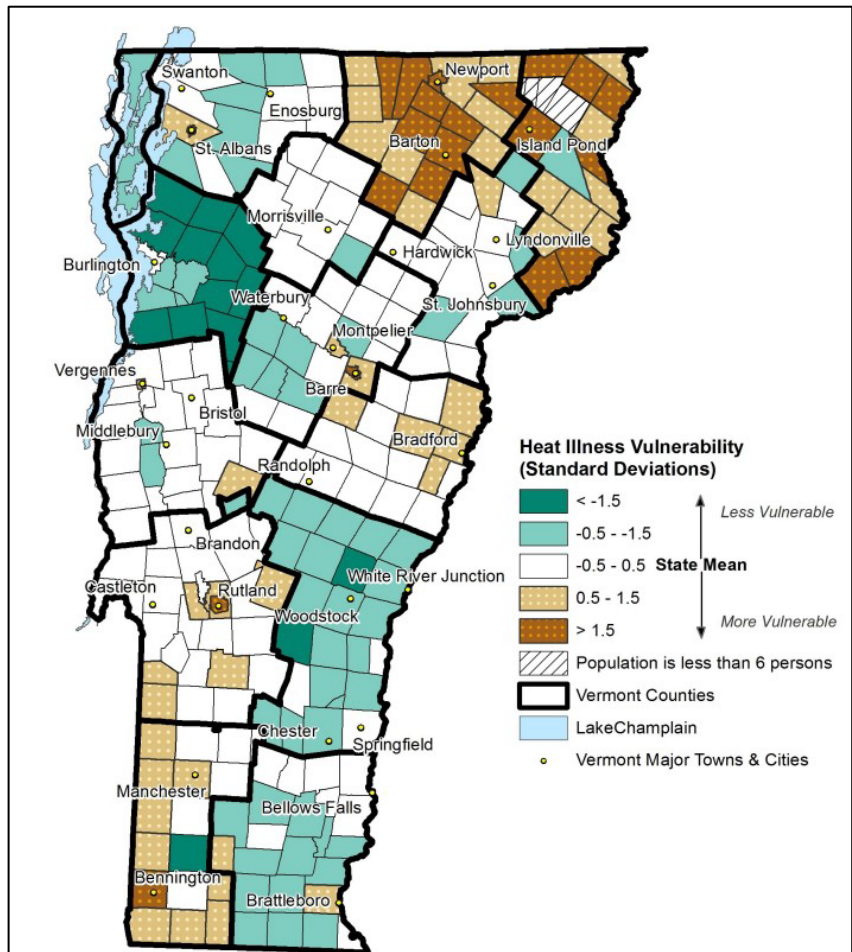


Figure 3.9.1 Heat Vulnerability Index: Vermont Dept. of Health

Just because the Northeast Kingdom is one of the cooler regions of Vermont, our population is not less vulnerable to heat. In fact, Department of Health data indicate that Orleans County have some of the highest concentrations of communities with high heat vulnerability indices. The Vermont Heat Vulnerability Index draws on 17 different measures from six different themes: population,

<sup>8</sup> Vermont Department of Health: Vermont Climate and Health Profile Report: Building Resilience Against Climate Change in Vermont, September 2016

socioeconomic, health, environmental, and heat illness. Craftsbury’s heat vulnerability index exceeds the state mean by more 1.5.

While excess summer heat in Craftsbury may be seen as a boon to agricultural crops, a continuing warming trend is likely to stress livestock production. Increased evapotranspiration and soil drying are also likely to stress or deplete water supplies. Additionally, hot weather can increase thermal stratification in water bodies, where shallow water layers are much warmer and do not readily mix with cooler, deeper water layers. The stratified water layers create more favorable conditions for cyanobacteria blooms, which can create health risks for boaters and swimmers who use Craftsbury’s lakes and ponds.

Table 2B.9.1: Extreme Heat Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Children, seniors, people with underlying conditions, people below the poverty line; water supplies and water bodies; livestock	July 2018, with 10 days 87° or higher	Increased hospitalizations due to heat-related illness (VT Dept. of Health data), four heat-related deaths reported statewide in the summer of 2018	<b>Likely:</b> >10% but < 75% in any year; at least one chance in next 10 years

## C. Hazard Specific Information for Non-Profiled Risk

### 1. Landslide

Landslides are sudden failures of steep slopes and can cause significant damage to streams, infrastructure, and property. While landslides can be linked to fluvial erosion, they can also be caused by slope steepening due to non-fluvial erosion, increased loading on the top of a slope, or pore-water issues. Landslides can destroy or damage structures and infrastructure that lie either above or below the slope.

The 2018 Vermont State Hazard Mitigation Plan notes that while minimal data exists on damages associated with landslides, they often occur in tandem with periods of significant rainfall and erosion. Disaster declarations and estimates specific to landslide-only damages are not well defined. The 2018 Plan also notes that “Vermont has not previously developed a landslide inventory or an adequate tracking system to establish frequency of this hazard.” The nearest landslide risk is probably the rock-lined portion along Route 15 just at the entry to downtown Hardwick. There is no similar land formation in Craftsbury.

### 2. Earthquake

The risk of earthquake is quite low in Vermont -- low enough that it is not prudent to invest in mitigation. According to FEMA Seismic Hazard Maps, Craftsbury (and nearly all of the state) is in a “Seismic Design Category B” area, which means that only moderate shaking is to be expected in an earthquake. Although the sensation can be extremely disconcerting, the potential for damage is slight. The nearest reported earthquake was of a 2.2 magnitude about 11 km ENE from Ticonderoga, NY, which occurred on June 30, 2017 and was felt by people in Montpelier and Plainfield, VT.

### 3. MITIGATION STRATEGIES

#### A. Mitigation Goals

This section of the plan satisfies 44 CFR §201.6(c)(i-iv)

- Prevent/reduce the loss of life and injury resulting from all-hazard events.
- Prevent/reduce the financial losses and infrastructure damage incurred by municipal/residential, agricultural, and commercial establishment due to disasters.
- Include hazard mitigation planning in the municipal planning process, including the Town Plan, municipal budget, and Local Emergency Management Plan.
- Ensure the general public is part of the hazard mitigation planning process.

#### B. Evaluation of Mitigation Strategies

In support of these goals, the Craftsbury Hazard Mitigation Planning Team presented a set of proposed mitigation actions for consideration in a widely publicized public meeting on May 24, 2022. To obtain FEMA approval for this proposed hazard mitigation plan, the team was required to identify and analyze a comprehensive range of specific mitigation actions. To make this analysis objective, the team used a ranking process for each proposed mitigation action, assigning a score of 1 (poor) to 5 (excellent) for each of the following criteria:

- **Social:** The proposed mitigation action doesn't hurt anyone, and it's compatible with social and cultural views.
- **Technical:** The proposed mitigation action reduces losses in the long-term with minimal secondary adverse impacts.
- **Administrative:** We have capacity (paid or volunteer staffing and funding to carry out the proposed mitigation action.
- **Political:** Everyone is behind the proposed mitigation action. There is broad public consensus.
- **Legal:** Whoever is carrying out the proposed mitigation action has the authority to do it.
- **Economic:** The proposal mitigation action is cost-effective.
- **Environmental:** The proposed mitigation action is environmentally sound.

Based on overall scoring, the Craftsbury Hazard Mitigation Planning Team grouped proposed mitigation actions into three categories for implementation:

- **Near-term:** Mitigation strategies that can be readily implemented within the next 24 months because the capacity and funding are already in place, and there is widespread support. This also includes strategies that are ongoing efforts.
- **Mid-term:** Mitigation strategies that could be implemented within the next 24 months, but will require research, technical support, funding, public buy-in, or all of the above.
- **Long-term:** Mitigation strategies that could be implemented within the next 24-60 months, and may take longer due to their complexity or the need for research, technical funding, or public buy-in.

**A mid- or long-term prioritization does not mean that the mitigation action has less value to the community.** Proposed actions with questionable value or too many obstacles for implementation were

ultimately not included in this plan. This ranking ultimately balances a consideration of readiness with potential benefit to the community. More information on the ranking process is available in Appendix A.

Mitigation actions marked with an asterisk reflect strategies already identified in the 2016 Craftsbury Town Plan.

Table 3B.1 Mitigation Actions

All Hazards			
Proposed Action	Local Leadership	Timeframe	Resources/Notes
Explore a backup power source for the Primary Local Shelter (Craftsbury Academy)	Academy School Board	Near-term (within 24 months)	FEMA grant programs
Explore backup generation for the water system on the Common in support of emergency sheltering capacity	Fire District #2	Mid-term (within 36 months)	FEMA grant programs; Cost-benefit should be explored.
Identify alternate emergency shelter(s) for the Town closer than the North Country Union High School	Selectboard	Near-term (within 24 months)	FEMA grant programs, NVDA, Statewide Local Emergency Planning Commission
Ensure that the Local Emergency Management Plan is kept up-to-date.* Keep emergency information on the Town Web site current.	Selectboard	Near-term (within 12 months, and then every year)	NVDA In conjunction with the annual LHMP review.
Ensure residents have timely information about solid waste disposal options.	Neighbor to Neighbor	Near-term (ongoing)	Lamoille Regional Solid Waste Management District
Establish a permanent location for the Craftsbury satellite food pantry. Identify equipment, storage, and capital needs.*	Hardwick Area Food Pantry	Long-term (36-60 months)	NVDA community health planner; Feasibility studies are needed. Grant funding opportunities include Municipal Planning Grant, Vermont Community Foundation;
Integrate the operations of Neighbor to Neighbor into the Local Emergency Management Plan.	Selectboard/Neighbor to Neighbor	Near-term (within 12 months, then ongoing)	
Flooding and Fluvial Erosion			
Proposed Action	Local Leadership	Timeframe	Resources/Notes
Support flood mapping updates and review new flood map information as it becomes available.	Planning Commission	Long-term (24-60 months)	Agency of Natural Resources, NVDA – Both will provide technical assistance

Continue to identify and map Craftsbury's natural flood protection assets, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forest areas.*	Planning Commission	Near-term (ongoing)	Agency of Natural Resources; floodready.vermont.gov;
Review the flood regulations to ensure continued compliance with the National Flood Insurance Program.	Planning Commission	Mid-term (36 months)	Agency of Natural Resources, NVDA, basin planners; grants include Municipal Planning Grants, and 604(B) water quality programming
Consider regulations that will protect erosion-prone and floodwater storage areas from additional development and encroachment.*	Planning Commission	Long-term (36-60 months)	Agency of Natural Resources, NVDA, basin planners; grants include Municipal Planning Grants, and 604(B) water quality programming
Continue to meet Vtrans Road and Bridge standards. *	Road Foreman	Near-term (ongoing)	NVDA training and technical assistance and programs include Road Foreman Trainings, Transportation Advisory Committee
Continue updating of the Town's transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool.*	Road Foreman	Near-term (ongoing)	NVDA training and technical assistance and programs include Road Foreman Trainings, Transportation Advisory Committee; Better Back Roads
Identify and replace undersized and failing culverts. *	Selectboard/Road Foreman	Near-term (ongoing)	Grants include FEMA, Better Back Roads, Grants-in-Aid
Ensure proper training and outreach regarding development in flood hazard areas, including forms of development exempt from local regulation, such as required agricultural practices. *	Planning Commission	Long-term (36-60 months)	Agency of Natural Resources; floodready.vermont.gov

**Ice/Wind/Snow**

<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Continue the town's program to clear tree limbs, maintain town road rights of way, and protect town infrastructure.	Selectboard/Road Foreman	Near-term (ongoing)	NVDA Road Foreman trainings



Promote safe winter driving practices (e.g. keep vehicles clear of snow and ice, pack emergency supplies in car, and don't crowd the plow)	Neighbor to Neighbor	Near-term (ongoing)	Front Porch Forum and other social media; VTrans has outreach materials
Promote awareness of a winter tire access program for low-income residents with used (but still usable) winter tires.	Neighbor to Neighbor	Near-term (ongoing)	Wheels for Warmth (through Capstone Community Action)
<b>Drought</b>			
<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Disseminate the Craftsbury Groundwater Mapping project to better inform the residents who use well or spring water supplies about the quality and condition of the water sources. *	Planning Commission	Near-term (ongoing)	Already on the Conservation Commission web site.
Encourage people to enter information into the Agency of Natural Resources Drinking Water Drought Reporter by linking to it from Town web site.	Selectboard	Mid-term (next 24 months)	
<b>Cold</b>			
<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Support efforts to distribute firewood to residents in need.	Energy Committee	Near-term (ongoing)	
Make information available about low- and no-cost weatherization opportunities, as well as lending programs.	Energy Committee	Near-term (ongoing)	HEAT Squad, Northeast Employment Training Organization, Heat Saver Loans, Efficiency Vermont, USDA Direct and Guaranteed Loan programs.
Complete energy audits on Town and public structures and continue to address weatherization. Publicize results.	Selectboard, School Board, Library	Long-term (36-60 months)	Energy Committee, Vermont Energy Dashboard
<b>Invasives</b>			
<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Identify areas along roadways with severe infestation and work with	Conservation Commission/Road Foreman	Long-term (24-60 months)	NVDA Road Foreman trainings; grants, such as Better Back Roads



road crew to identify appropriate management practices.			
Support education and outreach efforts regarding best practices for lake and pond users.	Lake association(s)/ Conservation Commission	Near-term (ongoing)	Agency of Natural Resources, NVDA water quality planner
Conduct a survey of trees in public ROWs that may be impacted by Emerald Ash Borer.	Ash Tree Inventory Work Group	Near-term (currently underway)	
<b>Snow</b>			
<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Educate the public on keeping heating exhaust vents clear in the case of extreme snowfall.	Energy Committee	Near-term (12 months)	Front Porch Forum and other social media
Establish a network of volunteers to dig out residents who need help.	Neighbor to Neighbor	Near-term (ongoing)	
<b>Heat</b>			
<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Work with home health care providers and volunteers to increase awareness of heat illness.	Neighbor to Neighbor	Mid-term (next 24 months)	The Dept. of Health has grants, outreach materials, and a media toolkit. NVDA has a climate health planner.
Identify elders at risk in a heat emergency and identify spaces/buildings where they may find relief from heat.	Neighbor to Neighbor	Mid-term (next 24 months)	The Dept. of Health, NVDA climate health planner, NEK Council on Aging
Make information available about DIY cooling strategies.	Energy Committee	Near-term (next 12 months)	The Dept. of Health and NVDA can assist with outreach.
<b>Wildfire</b>			
<b>Proposed Action</b>	<b>Local Leadership</b>	<b>Timeframe</b>	<b>Resources/Notes</b>
Maintain existing dry hydrants by checking and servicing them annually.	Fire Department	Near-term (ongoing)	Grant funds are available, which allow the Fire Dept. to do this every year.
Post information about fire danger levels and the need for burn permits.	Selectboard/Town Web Site Content Manager	Near-term (currently underway)	Campaigns can be seasonal and/or deployed around drought. Front Porch Forum and other social media can be useful.
Issue fines for burn violations.	Selectboard/Fire Warden	Mid-term (24-60 months)	

Table 3B.2: Update on Mitigation Actions from 2005 Craftsbury All-Hazards Plan

When determining the proposed mitigation actions for the 2022 plan, the Hazard Mitigation Team also evaluated the prioritized mitigation actions from the original plan.

**This section of the Plan satisfies the requirements of 44 CFR 201.6(d)(3).**

Project/Priority	Mitigation Action and Initial Steps	Update
Emergency generators for backup power for critical facilities – HIGH	Provide power to residents in emergency shelters because power can go out for days at a time. Generators will also need to pump water to shelters. Seek cost options.	The 2022 plan has a proposed mitigation action to explore a backup power source for the Primary Local Shelter (Craftsbury Academy) and explore backup generation for the water system on the Common in support of emergency sheltering.
Properly equipped shelter – HIGH	Needed for mass sheltering when outside help is not accessible. A mobile shelter will be explored.	Although a mobile shelter was not deemed cost-effective by the hazard mitigation team, the 2022 plan has a proposed mitigation action to identify alternate emergency shelter(s) for the Town closer than the North Country Union High School.
Larger generators at Sterling College and Sports Center ( <i>sic</i> Craftsbury Outdoor Center) – not prioritized.	Provide power to residents in emergency shelters because power can go out for days at a time. Generators will also need to pump water to shelters. Seek options.	

Table 3B.3: Status of Community Resources and Capabilities

**This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3) and 44 CFR 201.6(c)(3)(ii).**

Resource	Description	How it can help implement Hazard Mitigation Goals	Status
Craftsbury Town Plan	Plans for coordinated town-wide planning for land use, municipal facilities. It also establishes the legal basis for flood hazard regulations.	Addresses flood resilience, which became a statutory requirement in 2014.	The Town Plan is current but is set to expire in 2024. Amendments to the plan should incorporate relevant findings from this plan.
Craftsbury Planning Commission	Drafts amendments to the town plan and flood hazard regulations.	Helps to keep flood risks at the forefront with the general public and ensures ongoing participation in the National Flood Insurance Program.	Outreach to public to create awareness of regulations and their role in hazard mitigation may improve effectiveness of the regulations. Trainings and outreach from the Agency of Natural Resources and the regional planning commission would be helpful.
National Flood Insurance Program (NFIP), compliant since 5/02/2000	Enables all residents in Craftsbury to obtain flood insurance, whether or not a structure is located in a mapped flood hazard area. The effective date of the most recent Flood	Covers damage caused by flooding and informs residents of flood risk. Effective in ensuring that future development is safe from flooding.	

	Insurance Risk Map is 11/19/1976, and there are currently 3 policies in effect with a collective total coverage of \$169,000. FEMA records show that there are no claims paid and no repetitive loss structures.		Regulations are more than two decades old, and FEMA can update the interpretation of its own standards from time to time. Now would be a good time to ask the Agency of Natural Resources (NFIP Coordinator) for a technical review of the regulations.
Flood Hazard Regulations Administrator	Ensures compliance with zoning and flood hazard regulations.	Implements the local flood regulations to minimize flood hazard risk.	
Neighbor to Neighbor (N2N)	An official town task force with the mission of aiding and supporting the community during times of distress. N2N also addresses and supports ongoing resiliency work in the community during “usual” times.	N2N can address the human side of disaster management by delivering food and supplies to vulnerable populations, providing information about available resources, identifying gaps in services and finding ways to address them, and making food and emotional support available to those who need it.	VEM updated the LEMP process in 2019 to allow more flexibility and incorporate more planning resources.  The role of Neighbor to Neighbor in responding to the social welfare issues created by disasters should be documented in the plan.
Local Emergency Management Plan (LEMP)	Basic municipal procedures for emergency response. This gets updated annually.	The LEMP outlines procedures for call-outs, evacuations, etc.	
Energy Committee	The Town Energy Committee’s mission is to help guide the town and its citizens into a more sustainable energy future.	Members can assist with outreach regarding effective weatherization opportunities, as well ways to improve cooling and ventilation in the home.	Regional organizations like HEAT Squad and Northeast Employment Training Organization can help with outreach.
Conservation Commission	The major goal of the Conservation Commission is to encourage responsible stewardship of Craftsbury’s natural and cultural resources.	The commission has held workshops on identification as well as removal techniques for various species. The commission has also provided a ‘field guide to invasive plants’ for the Craftsbury Road Crew.	Representation on the local hazard mitigation team will assist with coordination of hazard mitigation actions.
Regional Emergency Management Committee (REMC)	Volunteer organization involved in hazard mitigation efforts.	In 2021, the REMC replaced the two Local Emergency Planning Committees in the	We anticipate that a broader regional process will be more efficient. Since this is a relatively

		Northeast Kingdom with one organization to focus on natural AND man-made disasters, such as hazardous materials release. The Local Emergency Management Director and one emergency services representative from each town and city in the region shall serve as the voting members of the committee.	new board, local representatives to the board should monitor for necessary improvements to the planning process, as they arise.
Municipal Roads General Permit (MRGP)	State standards have been updated to include the MRGP to control runoff and drainage on hydrologically connected road segments. Compliance is being phased in over time.	Effective in controlling road erosion and stormwater runoff. Provides funding sources for compliance.	Work with regional planning commission to pursue grant opportunities to implement recommended improvements.
Infrastructure & Road Maintenance Programs	Town Bridge and Culvert Inventory	Effective in tracking and planning for upgrades to most vulnerable infrastructure	Technical assistance from the regional planning commission can be helpful.
State Road and Bridge Standards	The Town complies with design and construction standards for roads, bridges, and drainage structures.	Effective through their continued implementation.	Continued implementation is critical to effectiveness. No improvements to be made by the Town.

## 4. KEEPING THE PLAN RELEVANT

### A. Integration with Future Planning Endeavors and Local Decisions

The existing Craftsbury Town Plan, Flood Hazard Regulations, and local Emergency Operations Plan informed the development of this Local Hazard Mitigation Plan. Once adopted, there are significant opportunities to make this document a relevant and dynamic force in local decision making. State statute, for example, requires town plans to contain a flood resilience element. This element can and should incorporate a locally adopted and FEMA-approved hazard mitigation plan. Subsequent updates to Craftsbury’s Town Plan, which expires in 2024, will incorporate recommendations from this updated plan.

**This section of the plan satisfies 44 CFR 201.6(c)(4)(i-ii)**

Additionally, Craftsbury’s flood hazard regulations have not been updated since 2001. A review and update of the regulations will occur when new FEMA mapping data is available. Updates will, at a minimum, assure ongoing compliance with 44 CFR, the federal code of regulations that governs

participation in the National Flood Insurance Program. Additional flood risks, such as fluvial erosion, will be considered; however, this plan cannot guarantee adoption.

Craftsbury's Local Emergency Management Plan, a guidebook to be used in the early stages of disaster response, must be updated every year in the period between Town Meeting Day and May 1. The LEMP must follow the format of State-provided templates. The LEMP can and should be updated to delineate local response strategies to the natural hazards outlined in this Hazard Mitigation Plan. The regional planning commission has staff that can assist.

## **B. Implementation and Monitoring of Mitigation Strategies**

After adoption of this Hazard Mitigation Plan, the Town of Craftsbury will make the plan available to the general public from its website ([townofcraftsbury.com](http://townofcraftsbury.com)). The plan will also be available from the regional planning commission's website ([nvda.net](http://nvda.net)).

Once approved by FEMA and adopted by the Town, Craftsbury's Local Hazard Mitigation Plan (LHMP) will be valid for five years. In the interim, the plan can be amended if desired to include updates on mitigation progress and new mitigation actions. Interim amendments do not require a formal re-adoption of the plan. Craftsbury plans an annual interim review of its LHMP in tandem with the annual review of the Local Emergency Management Plan (LEMP).

### **Plan for Interim Review**

The current Local Hazard Mitigation Plan was accomplished through a cross-functional team with members from the Planning Commission (including the flood plain expert), Conservation Commission, Neighbor to Neighbor (chair and emergency management representative), and a Craftsbury road crew and fire department member. Moving forward Craftsbury will conduct its annual interim review of LHMP progress and action items utilizing the same or similar group and in tandem with the LEMP, thereby optimizing collaboration and knowledge among town subject matter experts and minimizing duplication of effort. The annual review is not intended to be burdensome or exhaustive, but rather an interim check on the implementation and progress of outlined hazard mitigation strategies, noting those that have been completed and identifying barriers to or next steps for implementing remaining strategies.

Craftsbury's selectboard chair is responsible for initiating this annual review process and will take primary responsibility for ensuring the process occurs. No less than two months prior to the annual LEMP due date the Chair will call together the LHMP review group and charge them with 1) contacting individuals and entities tasked with carrying out mitigation actions to review progress and needs, 2) meeting with the LEMP review team to review discoveries, consider adjustments to strategies, and 3) setting a date to discuss results with the Selectboard at a warned meeting prior to LEMP due dates. This Selectboard meeting will provide opportunity for citizens and town officials to consider the town's progress in implementing mitigation strategies and to give input on future activities and possible plan revisions.

As part of the annual interim review, reviewers will note any significant losses that occurred over the previous year (regardless of whether the loss was associated with a federal disaster declaration) and include such information for the Selectboard. Significant losses may include, but are certainly not limited to, damage to buildings, widespread power outages, fires, loss of water supplies, damage to roads and public infrastructure, business interruptions, and crop losses. This information will be helpful for subsequent updates to the Hazard Mitigation Plan, since published datasets rarely capture a thorough and nuanced depiction of local hazards and vulnerabilities.

Entities tasked with mitigation actions will be encouraged to participate at the Selectboard meeting. Additional stakeholders may also be invited, including local businesses and non-profits, VTrans, the Vermont Agency of Natural Resources (VT ANR), and Northeastern Vermont Development Association (NVDA).

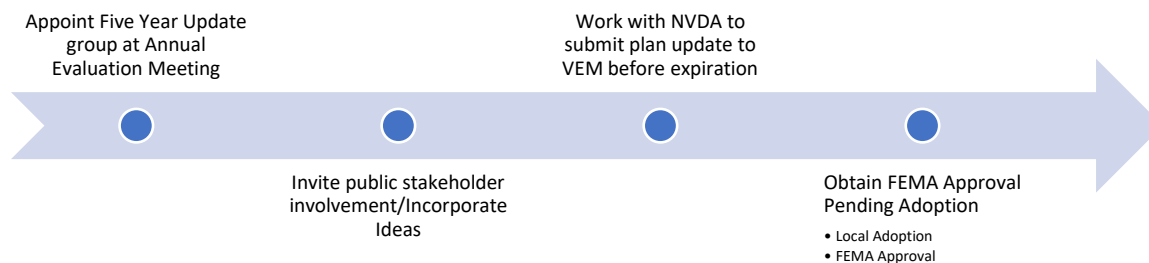
### Five Year Update

Before the LHMP expires, the Town must prepare a plan update and submit it to Vermont Emergency Management for formal review before readoption. The ongoing evaluation process should keep this in mind to ensure annual reviews both inform and lessen the burden of the five-year update and readoption process, which must be officially completed before the plan's expiration date. At the four-year joint interim annual review described above, the review team will advise the Selectboard chair of the anticipated length of time needed to perform the five-year update, and the Selectboard will charge the same or similar group with the timely undertaking of the five-year plan update. NVDA will help with the plan update if requested by the Selectboard and if funding is available. Ultimately, it is the Town's responsibility to update the Local Hazard Mitigation Plan.

### Process Illustration: After Plan Adoption – and every year



### Year Four of Plan



## APPENDIX A: EVALUATION OF PROPOSED MITIGATION ACTIONS

When evaluating proposed hazard mitigation actions, the Craftsbury Hazard Mitigation Team used a version of the STAPLE+E which assigns a score of 1 to 5 on seven factors:

Social: It doesn't hurt anyone, and it's compatible with social and cultural views

- Technical: It reduces losses long-term with minimal secondary adverse impacts
- Administrative: The staffing and funding to do it is there
- Political: Everyone's behind it
- Legal: Whoever is doing it has the authority to do it
- Economic: It's cost effective
- Environmental: It's environmentally sound

1. Poor
2. Below average/Unknown
3. Average
4. Above Average
5. Excellent



All Hazards								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Explore a backup power source for the Primary Local Shelter (Craftsbury Academy)	4	4	4	4	4	4	2	4
Explore backup generation for the water system on the Common in support of emergency sheltering capacity	5	3	2	2	5	2	2	3
Identify alternate emergency shelter(s) for the Town closer than the North Country Union High School.	5	5	4	5	5	5	5	5
Ensure that the Local Emergency Management Plan is kept up-to-date.* Keep emergency information on the Town Web site current.	5	5	3	5	5	5	5	5
Ensure residents have timely information about solid waste disposal options.	5	5	5	5	5	5	5	5
Establish a permanent location for the Craftsbury satellite food pantry. Identify equipment, storage, and capital needs.*	4	5	3	4	5	3	5	4
Integrate the operations of Neighbor to Neighbor into the Local Emergency Management Plan.	5	5	5	5	5	5	5	5

Flooding and Fluvial Erosion								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Support flood mapping updates and review new flood map information as it becomes available.	3	5	5	3	5	3	5	4
Continue to identify and map Craftsbury's natural flood protection assets, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forest areas.*	4	4	4	4	5	3	5	4
Review the flood regulations to ensure continued compliance with the National Flood Insurance Program.	4	4	4	3	5	4	4	4

Consider regulations that will protect erosion-prone and floodwater storage areas from additional development and encroachment.*	3	5	4	3	5	4	4	4
Continue to meet VTRANS Road and Bridge standards. Participate in regional road foreman trainings and Transportation Advisory Committee meetings to stay abreast of flood resilience measures for the Town's roads and bridges.*	5	4	2	5	5	3	4	4
Continue updating of the Town's transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool.*	5	5	5	5	5	5	5	5
Identify and replace undersized and failing culverts.*	5	5	3	5	5	5	4	5
Ensure proper training and outreach regarding development in flood hazard areas, including forms of development exempt from local regulation, such as required agricultural practices.*	4	5	2	3	5	3	4	4

Ice/Wind/Snow								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Continue the town's program to clear tree limbs, maintain town road rights of way, and protect town infrastructure.	4	4	5	4	5	3	3	4
Promote safe winter driving practices (e.g. keep vehicles clear of snow and ice, pack emergency supplies in car, and don't crowd the plow).	4	4	2	4	3	4	4	4
Promote awareness of a winter tire access program for low-income residents with used (but still usable!) winter tires.	4	4	2	4	3	4	4	4
Drought								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Disseminate the Craftsbury Groundwater Mapping project to better inform the residents who use well or spring water supplies about the quality and condition of the water sources.*	5	5	5	5	5	5	5	5
Encourage people to enter information into the Agency of Natural Resources Drinking Water Drought Reporter by linking to it from Town web site.	4	4	2	4	4	4	4	4
Cold								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Support efforts to distribute firewood to residents in need.	5	5	5	5	5	5	5	5
Make information available about low- and no-cost weatherization and lending programs such as HEAT Squad and Northeast Employment Training Organization (NETO), and USDA Rural Development.	5	5	5	5	5	5	5	5
Complete energy audits on Town and public structures and continue to address weatherization. Publicize results.*	5	4	2	5	5	5	5	4

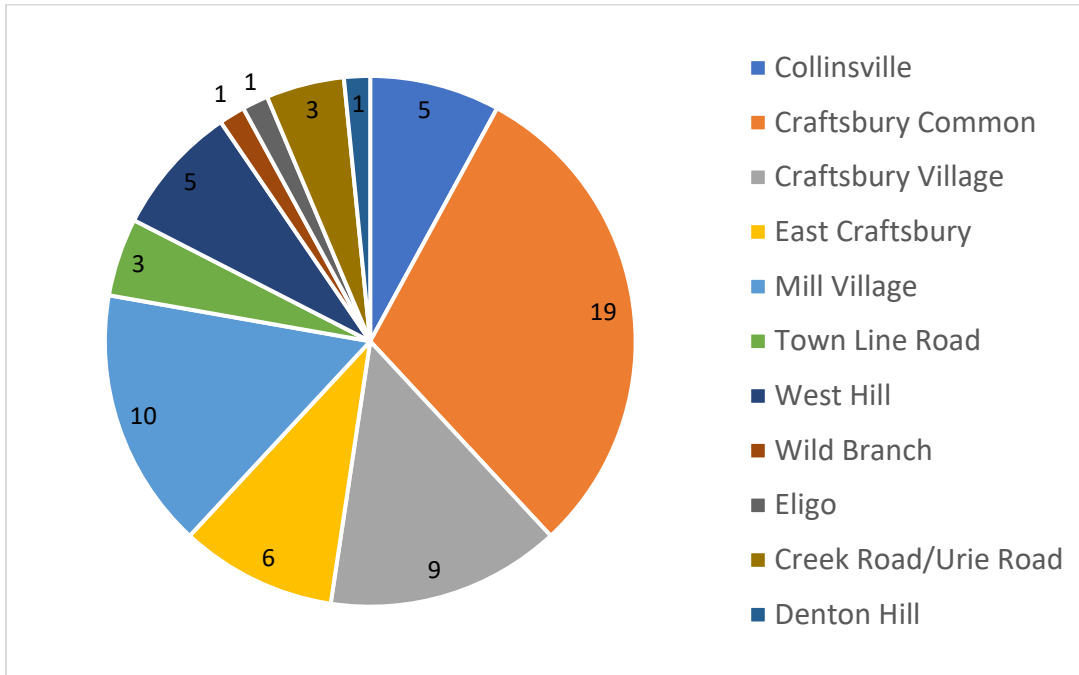
Invasives								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Identify area along roadways with severe infestation and work with road crew to identify appropriate management practices.	5	5	3	5	5	2	5	4
Support education and outreach efforts regarding best practices for lake and pond users.	5	5	3	5	5	2	5	4
Conduct a survey of trees in public ROWs that may be impacted by Emerald Ash Borer.	5	5	5	5	5	5	5	5
Snow								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Educate the public on keeping heating exhaust vents clear in the case of extreme snowfall.	5	5	5	5	5	5	5	5
Establish a network of volunteers to dig out residents who need help.	5	5	5	5	5	5	5	5
Heat								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Work with home health care providers and volunteers to increase awareness of heat illness. The Vermont Department of Health has outreach and training materials to spot the symptoms of heat illness and administer first aid.	5	5	3	5	5	5	5	5
Identify elders at risk in a heat emergency and identify areas where they may find relief from heat.	5	5	2	5	5	4	5	4
Make information available about DIY cooling strategies.	5	5	5	5	5	5	5	5

Wildfire								
Mitigation action	Social	Technical	Admin	Political	Legal	Economic	Environmental	Total
Maintain existing dry hydrants by checking and servicing them annually.	5	5	5	5	5	5	5	5
Post information about fire danger levels and the need for burn permits.	5	5	5	5	5	5	5	5
Issue fines for burn violations.	3	4	5	2	5	5	5	4

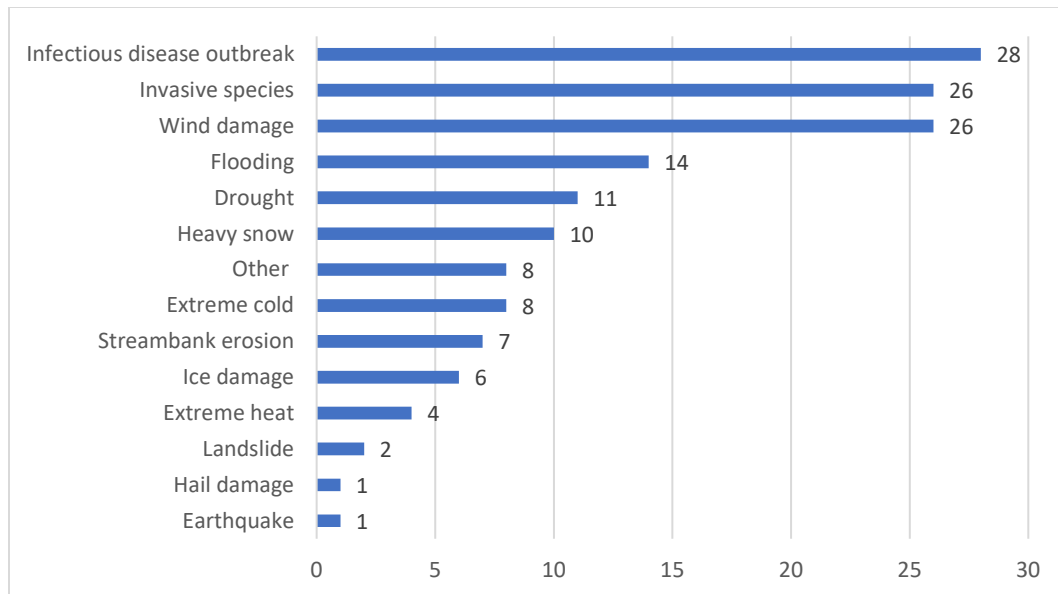
## APPENDIX B: CRAFTSBURY HAZARD MITIGATION SURVEY SUMMARY

### Craftsbury Hazard Mitigation Survey (67 Responses total)

1. Please tell us what part of town you live in. (Answered: 63; skipped: 4)



2. Have any of these hazards/events adversely affected you in the past 10 years? Please provide as many details as possible to help us understand how to lessen the impact in the future. For example: power loss, property/crop/livestock damage, time lost from work, injury, etc. (Answered: 63; skipped 4)



**Comments:**

Power loss from heavy snow/wind + Covid-19 both affected ability to work.

The most significant was the Halloween storm a few years ago that wiped out a few hundred feet of our road. It seems like it was put back together more substantially.

Lack of winter snow; Freeze/thaw fluctuations.

We've had a few trees come down in heavy winds. Thankfully they missed all structures. Branches snapped from ice and snow. Ongoing battle with knotweed as our neighbor likes it as a privacy hedge. One year of drought which thankfully ended before the well went completely dry.

Limb falling on car from wind.

Trees blown down; Buckthorn invasive; European spindle tree invasive; Asiatic bittersweet invasive

The only "serious" consequential threat is loss of normal winters and other effects of changes to the climate which result from greenhouse gas emissions far in excess of levels which ensure a sustainable climate.

PFA's in water supply. Extreme cold caused my pipes to freeze and my house to flood. Basement is often wet because of water table. High wind has taken down several trees and occasionally causes power outages, although not as many as some other parts of town. Nuisance species along roadsides that take over (although I'm not sure which ones are invasive and which are native)- bishops weed, knotweed, that wild parsley plant.

Burdock and possibly ash borer; Wind damage prior to our purchase of house (Note: the citing of ash borer was investigated, and it was not ash borer.)

Frequent power outages (resulting in no ability to communicate - when power goes out, internet goes out and only have wi-fi calling ability with cell service).

Damage to structures from high wind gusts; Crop damage from drought; infectious disease - obvious. social isolation.



Wind damage has taken down trees on our property including one that nearly destroyed an automobile. Wind and heavy snow have also resulted in numerous and extended power outages that make life difficult especially with young children. Exposure to some invasive plants has cause skin irritation and the nuisance of keeping them from overtaking native vegetation.

We currently have an unfolding disaster of unpotable contaminated drinking water on the Common, for all residents, the school, college, library, and church. This disaster has serious repercussions for the community and the volunteer board has been navigating very challenging and expensive regulatory hurdles to try to rectify. We do not have a new source identified and it is anticipated that we may not have new water for another 6 months to a year or more.

Contamination of drinking water. Community water system serving Craftsbury Common contamination with PFAS.

Japanese knotweed on my property. Got COVID.

Fluvial at my brook and culvert; drought - 2018, which caused well to go down further w/ arsenic results! Invasives: bishops weed, phrag, milfoil; infectious - mom at CCCC, 2 years of isolation for both of us; had to handle outbreak at CCCC. Lots of stress; affected gainful employment.

Figure not SB's job to help with dry well!

Winds break trees and can interrupt power. We now have a generator. This week we have lost power 3 times! Unusual, thankful for the generator, but hate the propane it uses! Many invasive plants, due to ditch drainage on all sides. COVID has affected every human all over the world...

Power outage

Wind - trees - microbursts - 2019 Halloween & others; COVID - lost job 9 mos. - so kids caregiver; 2013 ice storm -- trees

Flooding -- wrote "road washouts to work"; Heavy snow -- wrote "gets stuck"; Infectious disease -- wrote "COVID stopped working"

Next to "wind damage" wrote "tornado -- maybe more than 10 years"; Next to drought, wrote "apple tree damage"

Landslide -- erosion from stream; Invasives -- buckthorn

Invasives -- knotweed; Infectious -- "struggle w/help" and "isolation"

Earthquake -- in the 80s, cracked foundation; invasives -- milfoil

Flooding -- Town Line Road

Invasives -- Japanese knotweed

Flooding -- in cellar from storms or snow, regularly; Wind damage -- couple trees last winter; Infectious disease -- she stopped working

Wind damage -- trees down; Invasives -- honeysuckle

Infectious disease -- income impacted & emotional; Other -- road washout at Town Line

Flooding -- driveway and cellar; Wind damage -- tree in utility wires; Cold - pipes & house flooding; COVID -- school activities cancelled so cut 30% or more

Flooding -- Wild Branch washout affected commute; Invasives -- Honeysuckle invasion; Infectious disease -- COVID -- affected both jobs

Infectious disease -- COVID, work challenges, being cautious about illness

This last decade has been less costly than the 2 decades before.

I have only lived in Craftsbury Common for 16 months.

Well, we've got COVID for one. I had to do a bit of working getting rid of invasives on the little chunk of property I rent. The cold drains the oil in my furnace (old farmhouse), and the basement is by no means waterproof.

River bank is constantly folding into river!

**3. Do you have any suggestions on how to lessen the adverse impacts of these hazards/events?(Open-ended comments; Answered 24; Skipped 43)**

Bury all power lines-less impact from adverse environmental not to mention it looks 100% better.

Make sure that any roadside mowing operators clean their mower decks after cutting knot weed and other invasives.

Until we have, as a state and nation, decided that climate change is real and near, individual suggestions seem naïve.

Address climate change by the state and federal governments adopting policies and spending money on programs for all to reduce GHG emissions.

Given the thin soil over rocky ledge I'd love to see a community group to assist with the safe clearing of trees adjacent to homes, outbuildings and power lines.

I don't see invasive species as a hazard or "event", but invasive plants need to be eradicated.

As identified by the State of Vermont's Climate Action Plan, adverse impacts should be addressed by shifting away from fossil fuels which will require more renewable energy production and the necessary use of battery storage.

Area generators?

Commit to a plan & actions to eliminate dependence on fossil fuels in the town, and improve electric grid sustainability by incorporating microgrids & battery storage in infrastructure.

It is hard to advocate for clearing electrical lines wider in order to prevent trees from reaching lines so I'm not sure there is a way to make electrical service more resilient. Invasive management and limiting spread could be improved but requires a lot of buy in from many parties including the state. If state mowing takes place after plants have gone to seed they are just spreading more and more.

We need more community coordination on this issue. Aid in navigating the regulatory process, guidance, etc.

I live by the area where the conservation commission is working to control knotweed. More of would be good, I think.

Good planning and education!

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Continue to work on hydrologically connected roads. Citizen monitoring of hazards -- ROW mitigation outreach.

Power: would vastly prefer to have enough solar power with battery backup instead of relying on fossil fuels. Batteries to be made and improved to be more affordable would be excellent.; 2) Invasives require endless mulching, our problem. 3) Infectious diseases -- seems like we're all learning as we go. How to make do their best to care for one another, honoring big picture over fighting face mask rights.

These events are expected to happen in our winter environment and big winds. To lessen the impact -- have water reserved, keep flashlights that work, keep gas in the car, know your neighbors, offer help.

Town road crew needs to be sure the dirt they are hauling from one place to another is free of invasives. All landowners should be notified before the side mowing of streets and roads in their neighborhood so they can put up "DO NOT MOW" signs in invasive species areas so that the invasives are not spread.

Bush hogs, lawn mowers and other equipment that potentially comes in contact with invasives should be cleaned before being brought to a new site so that the invasives are not spread.

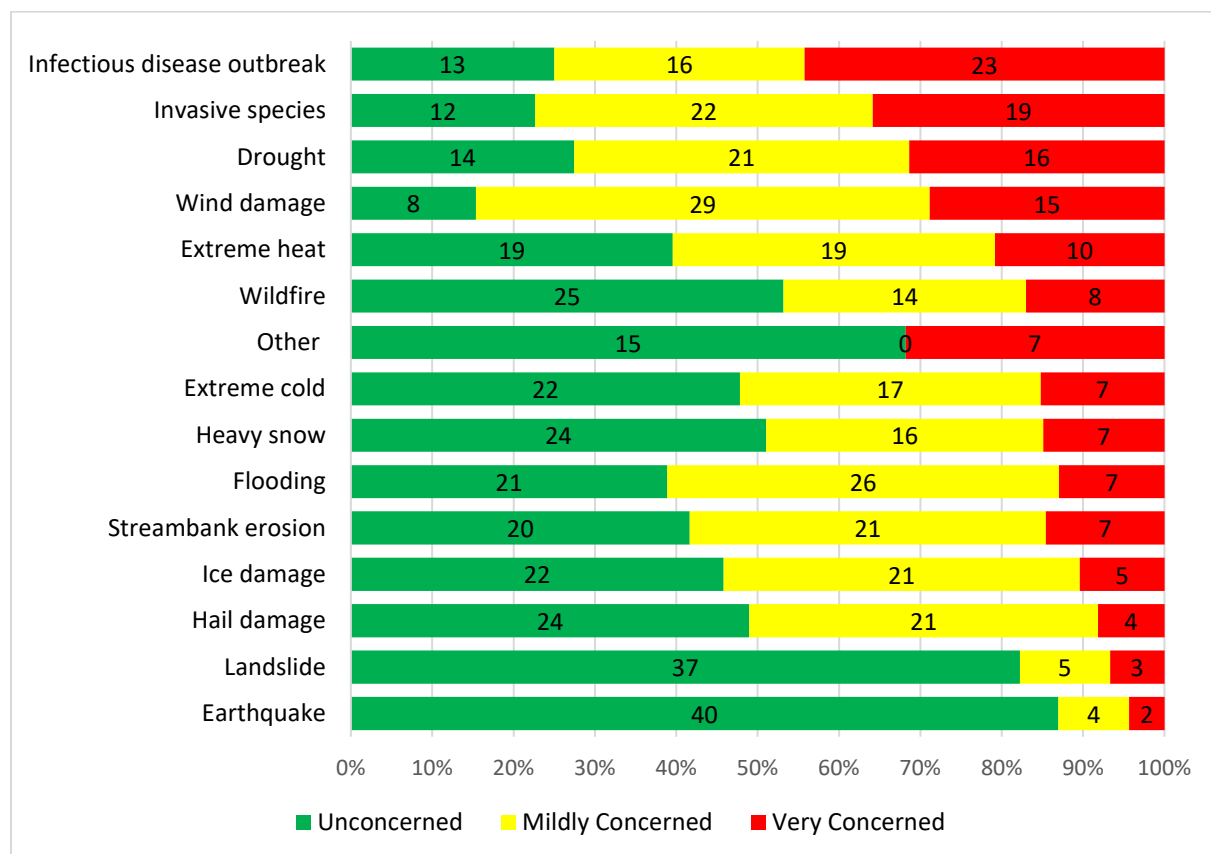
Get out of farming and get a job that does not depend on the weather.

Better building practices would go a long way at the house I'm in. Invasives are already gone, but awareness for everyone as to what's an invasive and how to get rid of them would be good. COVID is its own can of worms.

Willow planting along river.

Invasives - All neighbors recognize that it is a problem and help to eradicate things like Buckthorn, and Burning Bush so that it doesn't spread to the neighbors and beyond.

**4. Are you concerned about these hazards affecting you in the future? (Answered 61, skipped 6)**



**Comments:**

Is the "you" in this question refer to me personally or the community at large? Loss of winter. Summer heat. There is no mention of the economic, social or cultural impacts associate with these or other conditions not listed above.

Extremely concerned about PFAs and their effects on health.

Lack of power/ability to call for help/service: lack of quality high-speed broadband services (it's the digital divide): rural communities pay more for lower-quality, outdated DSL service. We have almost zero choice.

I am very concerned about potable water and the sustainability of our dwellings and institutions on the common without a potable water source.

Food availability and affordability; clean water availability.

Building in wet zones and flood zones. ;Old Septic tanks in flood zones. Not having an adequate drinking water source for Craftsbury Common.

World and climate -- need to worried about all of these.

Climate! All of these.

Most concerned about not being able to work .

Other is food supply/supply chain

Yes. I'm making it my job to combat all of these.

**5. Please add any comments that could help Craftsbury avoid or be better prepared for the adverse impacts of natural hazards. (Answered: 17; Skipped: 50)**

Solar for the town, bury power lines

Don't use bureaucrat speak. Words like hazard and mitigation are confusing and meaningless to many. Also their must be acknowledgement that climate change is causing an increase in events that are impacting Vermonters and the economy.

Cell coverage Broadband for all addresses. Emergency Shelter and transportation.

Educational programs to help community members identify and remove invasive species. Town officials could be more responsive to trees that are on the verge of falling into roads. I was nearly hit by a large one.

Keeping roadside drainage clear and maintained. Dissemination of emergency shelter/services info.

Join a NEK broadband service effort - get away from Consolidated and create a community-owned network; provide jobs for locals as well as provide quality high-speed broadband capabilities for citizens.

Look ahead to the future rather than assuming what has worked in the past will be good enough.

The most important thing is to ensure that any work that is done in the future takes these issues into account. Road design, construction, and maintenance, building design and construction, and operating practices can all have an impact and the most important thing we can do is not create things that will make matters worse.

Proactively planning for water contamination mitigation at the town level. this type of issue could affect any or all of us and involves life sustaining water supplies.

Taking steps toward making our designated emergency shelter, i.e. Craftsbury Academy more prepared for our residents is important. Solar power with battery backup would work! Hope another opportunity shows up that would help make this more reachable. As prevention goals: save energy, weatherize, go electric, limit methane, care for our ailing planet, etc.

Routinely advertise the system: who is in charge in case of emergency, where to go, "Remind people of helpful tools: sleeping bags, flashlights, etc., list of equipment, tractors, etc.

Make sure all bridges are in good shape so that people won't become isolated by a bridge being washed out. Fix the infrastructure in our community centers to have adequate and up to date septic systems and water resources. Be kind to Mother Nature.

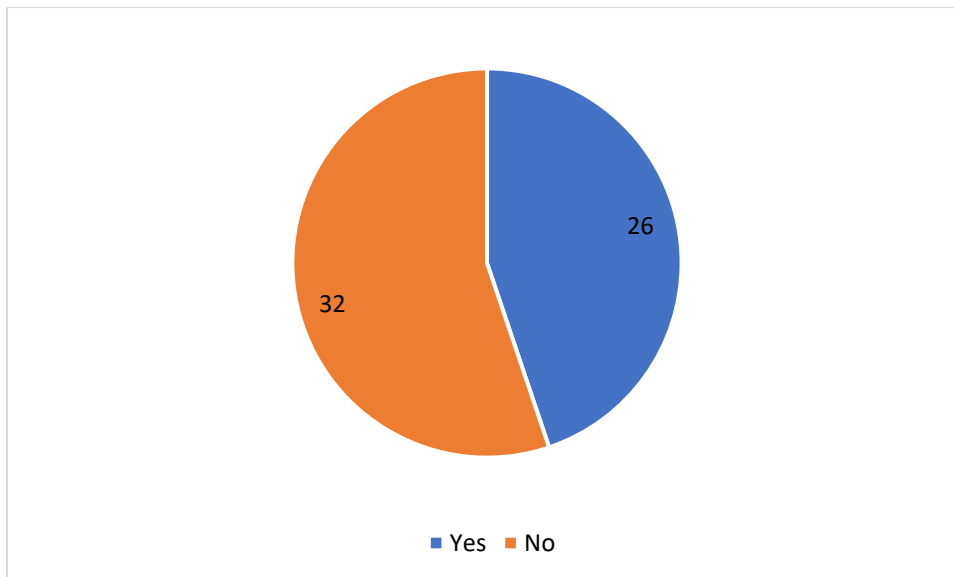
If "woodchipping" was available once or twice a year, perhaps more residents would remove dead wood from their properties, lessening the fire risk.

If I had my way, we'd have many more beavers (for drought and flooding), have a monitoring system for invasives (groups going out to sites for removal), incentives for better building insulation techniques/materials, and sweeping protections for all riparian zones (and make them larger).

Bolster the food pantry program! Community-based remediation projects (invasives, erosion control, etc.)

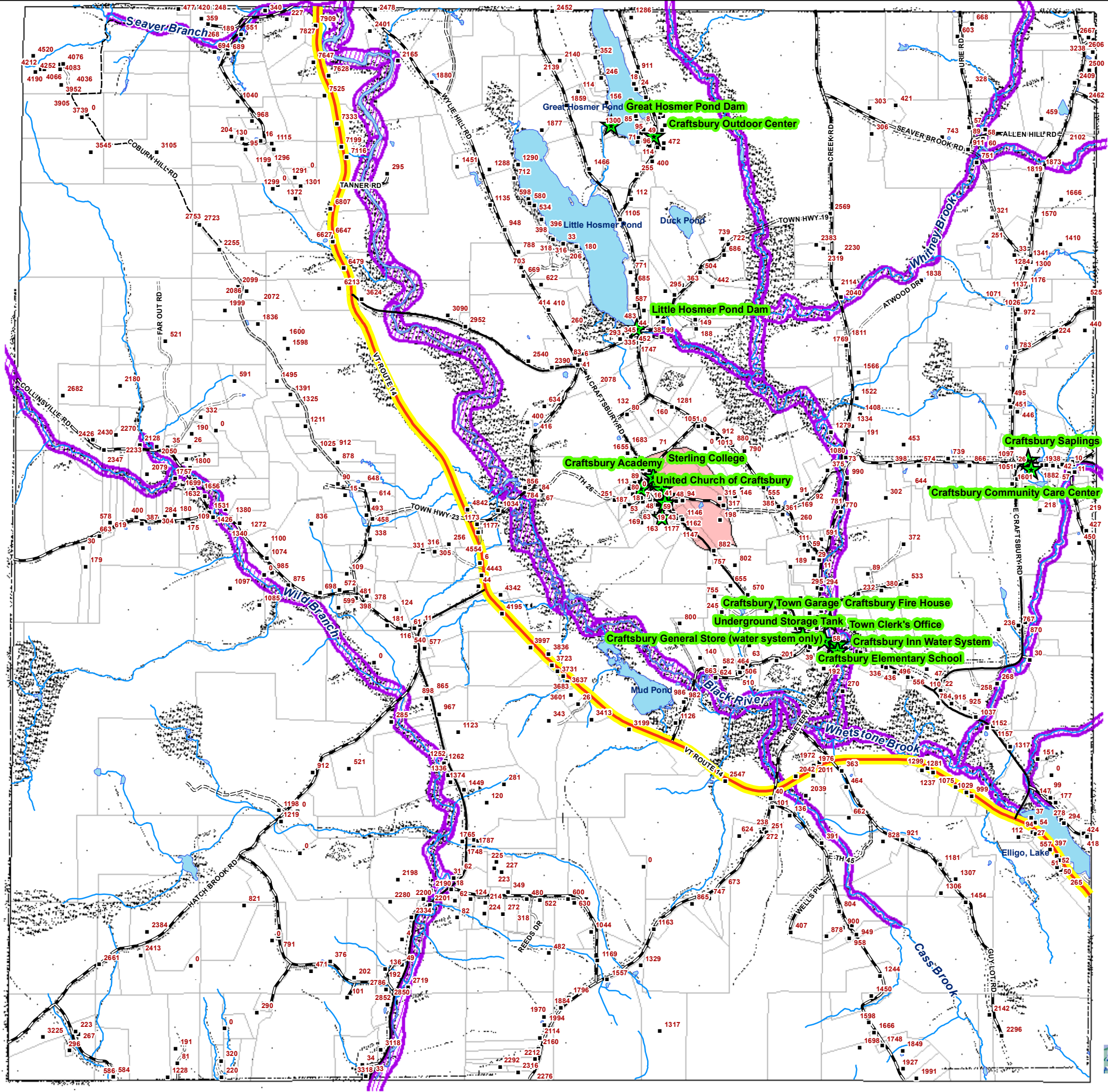
To me a lot of these are Climate-related. So implementing practices that reduce Climate change is important - Renewable Energy Generation, Energy Conservation, etc.

**6. Do you know the location of your nearest emergency shelter or services?**

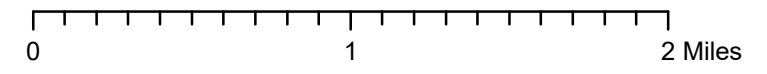


# Town of Craftsbury, VT Flood Hazard and River Corridors Map

08/04/2022



- E911 Address Points
- ★ Craftsbury Critical Facilities
- US & State Highway
- Paved Town Road
- Unpaved Town Road
- ==== Class 4 Town Road
- Legal Trail
- Private Road
- VT Route 14
- Streams
- Lakes, Ponds, and Rivers
- Parcel Boundaries
- ▨ ANR River Corridors
- ▨ Craftsbury Fire District 2
- ▨ Flood Hazard Areas - Unofficial



Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale sources, there may be some discrepancies between data layers.

This map should NOT be used to make determinations about whether structures and/or activities are in or out of a flood hazard area. In ALL cases, a flood specialist should be contacted to make any determination about the status of a structure or proposed structure.

