2023

Maidstone Local Hazard Mitigation Plan

CERTIFICATE OF LOCAL ADOPTION

Town of Maidstone, Vermont

A Resolution Adopting the Maidstone Local Hazard Mitigation Plan

Note: This resolution does not get signed until the plan is approved by Vermont Emergency Management!

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

WHEREAS, the Town of Maidstone 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 Maidstone Selectboard to formally approve and adopt the Maidstone Local Hazard Mitigation Plan.

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

Section 1. In accordance with the local rule for adopting resolutions, the Maidstone Selectboard adopts the Maidstone Local Hazard Mitigation Plan. While content related to Maidstone may require revisions to meet the plan approval requirements, changes occurring after adoption will not require Maidstone to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

Approved by the Selectboard on: September 11, 2023

Scott Lovell, Chairman	9-11-23 Date
Bruno McKenzie	9/11/23 Date
Brad McVetty	9-11-23 Date

Contents

1. Introduction

A. Purpose

The purpose of this plan is to assist the Town of Maidstone in identifying hazards and implementing mitigation actions to begin reducing their risks while creating resilient measures for future generations. Through community-driven hazard identification and prioritization, assessment of community vulnerabilities, and analysis of risk towards those vulnerabilities, this plan will generate sustainable

strategies to reduce or eliminate long-term risk to life and property from a natural hazard event. It is less costly to reduce vulnerability to disasters than to repeatedly repair damage. As climate change continues to produce more erratic and intense weather conditions, preparing for future hazards can reduce loss of life, property damage, community heritage, and the viable ecosystems we rely upon.

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

The goal of a Natural Hazard Mitigation Plan is to permanently reduce the risk and vulnerabilities by providing the community with the tools and awareness to increase education, collaboration, and cooperation when faced with natural hazards. By identifying and understanding the relationship between natural hazards, vulnerable systems, and existing capacity, Maidstone and its surrounding communities of support will be better equipped to identify and implement actions aimed at reducing the overall risk to natural hazards. 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
- Identifying and informing the public on primary and alternate evacuation routes
- Coordinating with local wildlife management programs
- Ensuring safe, clean, and 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 and provisioned
- 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, and several benefits in adopting a Local Hazard Mitigation Plan (LHMP):

- 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.
- 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. See the attainable requirements here.

- The National Flood Insurance Program (NFIP) is a voluntary program managed by FEMA and the Federal Insurance Agency (FIA), providing federally backed insurances that are often at more affordable rates with greater coverage than private offerings through local community adoption of a *minimum* set of local regulations to keep future development from flood damage. To be eligible, communities must have a regularly updated hazard mitigation plan and describe their continued compliance with NFIP requirements. Learn more here.
- Towns with an updated and approved LHMP are eligible for the Flood Resilient Communities Fund (FRCF) established by Vermont Legislature under Act 74, which can be read about here.

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.

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.

- **Brad McVetty**, Maidstone Selectboard & Road Commissioner
- **Bill Sanborn**, Maidstone Emergency Management Coordinator & Fire Warden
- **Chris von Alt**, Maidstone Planning & Zoning Board & Commission Member
- **Sandra Gray,** Maidstone Lister, Health Officer, & Town Auditor

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

A Senior Planner and the Emergency Planner from Northeastern Vermont Development Association (NVDA) worked both directly with the review working group and attended meetings. A Regional Planner from NVDA and was responsible for plan drafts and research. They were assisted by NVDA's GIS Specialist and Emergency Planner.

Public Involvement

Public involvement consisted of a public survey and two public meetings. See Table 1A.1. Survey and meetings were both highly publicized through multiple channels, including direct mail to all property owners (including seasonal residents) with a postage-paid return envelope. Full survey data is located in Appendix B.

Neighboring Communities and Relevant Agencies

Following the release of the first draft, 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, and NVDA's Water Quality Planner.

Table 1A.1: Chronology of Planning Process

Date(s)	Description
09/12/2022	Alison Low met with the Maidstone Selectboard (in a regularly warned meeting) to discuss the Local Hazard Mitigation Planning Process and ask the Selectboard to appoint a local team for NVDA to work with.
10/24/2022	Hazard Mitigation working group members met with NVDA staff to review process, identify public survey, and review ranking methods for natural hazards. The group assigned probability scores to each risk identified in the 2018 Vermont Hazard Mitigation Plan and noted impacts in Maidstone. Individuals on the working group received a copy of the ranking system and assigned impact scores for discussion at their next meeting.
11/01/23	NVDA staff met with the LHMP team to review the compiled rankings, as well as a draft set of mitigation strategies.
11/01/23 through 12/01/23	Community survey went live. A URL was publicized, and 350 paper copies of the survey were mailed to residents and property owners with postage paid return envelope. The survey invited members of the general public to a public meeting on December 5, 2022. The survey yielded 111 responses.
12/05/22	A public meeting was held (in person and virtual) at 6:00. In attendance were Brad McVetty (LHMP Comm.), Alison Low (NVDA), Bill Sanborn (LHMP Comm.), Sandy Gray (LHMP Comm.), Chris Von Alt (LHMP Comm.), Bob & Laurie Snowman, Bob & Andy Champagne-Willis, Lisa & Paul Plourde, Jan & Bruce Barker, Mary Von Alt, Burt & Carol Kline, June Lockert, Suzy Irwin and Amy Pear NVDA staff led a PowerPoint Presentation to explain the purpose of the Local Hazard Mitigation Plan, review the data from the survey regarding experiences and potential impacts from natural hazards, and to review the proposed mitigation strategies. It was noted that most people did not know where the Emergency Operation Center was located, according to survey respondents. There were no changes requested to the mitigation actions.
4/10/23	NVDA Regional Planner met with the LHMP Committee in person to discuss and vet viability of proposed mitigation strategies using the STAPLEE method approved by FEMA.
5/30/23	Final draft edits were conducted after LHMP Committee reviewed draft
6/01/23	Draft sent out for review to the State and neighboring communities of Ferdinand, Brunswick, Granby, Guildhall, and East Haven

Information Sources Reviewed

- Centers for Disease Control
- Federal Emergency Management Agency, Open FEMA Datasets https://www.fema.gov/about/openfema/data-sets#public
- National Weather Service, National Oceanic and Atmospheric Administration Storm Events Database, Essex County, VT https://www.noaa.gov/

- NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published March 2023, retrieved on March 27, 2023 from https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series
- NOAA/NWS NOWData Online Weather Data, Lancaster, New Hampshire
- Maidstone Town Plan, adopted February 1, 2016
- Town of Maidstone Annual Reports, 2017-2021
- Town of Maidstone Local Emergency Management Plan (LEMP), Adopted August, 2022
- 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
- 2021 American Community Survey (ACS) 5-Year Estimates
- Vermont Agency of Natural Resources, BioFinder https://anrmaps.vermont.gov/websites/BioFinder/
- 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/
- 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
- Flood Ready Vermont https://floodready.vermont.gov/
- VT Parcelization Website https://vtforesttrends.vnrc.org/home
- VT Outages https://vtoutages.org/
- Data from The Forest Ecosystem Monitoring Cooperative (FEMC) https://www.uvm.edu/femc/
- Land Management Plans (West Mountain WMA, Johnson Farm WMA, Maidstone State Forest Management Plan)
- The Vermont Association of Planning and Development Agencies (VADPA) Bridge and Culvert Inventory Status https://vapda.maps.arcgis.com/apps/dashboards/867c764a9a324fd2a1bba98d2edc7e18
- Maidstone Lake Association
- Vermont Climate Assessment, 2021
- New England and Northern New York Forest Ecosystem Vulnerability Assessment and Synthesis, United States Department of Agriculture (USDA)
- 2021 Upper Connecticut River Tactical Basin Plan
- Natural Resources Conservation Service (NRCS)
- Fluvial Geomorphology Assessment of the Northern Connecticut River, Vermont and New Hampshire, Connecticut River Joint Commissions, 2004
- *Riverbank Erosion Comparison along the Connecticut River* (2012)

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?

B. Community Profile

Town Background

(*All data was retrieved from Social Explorer's American Community Survey (ACS) 5-year Estimates, 2017-2021. Data retrieved can be found in Appendix F)*

Maidstone is a community of generational tradition, and therefore seeks much of its heritage through spoken word. Sparsely populated yet rich in abundance of natural resources, the town's tenets lie in forestry, agriculture, and the appreciation of the outdoors through recreation and the conservation of its wildlife habitat. Four separate parcels were identified in the Two Rivers-Ottauquechee Regional Commission (TRORC) GIS mapping system as Vermont Land Trust protected lands, totaling 855.55 acres.[1] One parcel of land totaling 1,461 acres is recorded in the Current Use Value Appraisal system.

Maidstone comprises 20,436 acres, or 32.21 square miles, with 1.5 square miles (over 4,800 acres) being surface water. Its lakes include Maidstone Lake (and the surrounding State Park), West Mountain Pond, Dutton Pond, & Stevens Pond. The Connecticut River bounds the eastern border of the town. Other waterways include West Mountain Brook, Paul Stream, Cutler Mill Brook, Dutton Brook, Granby Stream, and Rich Brook. All lakes aside from Maidstone Lake remain undeveloped. However, Maidstone Lake, accounting for 80% of the town's tax base, is virtually completely developed along the shoreline. The Town Plan has emphasized a commitment to protect these lake shorelines and educate the community about species habitat.

BioFinder considers all of Maidstone's forests to be of highest priority, roughly 18,488 acres in total. Its connectivity to other forests is also considered the highest priority.

Prevailing Development Trends

Though the Town Plan exhibits dramatic changes in population over the decades, its current full-time population resides around its census average at 212. Roughly 8% of its residents are aged 17 and under, 18% between the ages of 18 and 54, and 74% aged 55 and over. There are 334 total housing units. However, only 108 households are occupied by full-time residents, leaving 226 (or roughly two-thirds) houses vacant for seasonal vacation. Thus, the population density is 6.9 per square mile.

Of the 108 full-time households, 80% are occupied by two or more people. Approximately 55% of these units were built after 1980. The median household income is $65,500, $17,306 higher than the Essex County median income. The median house value is $382,100, over double the median value for the county ($132,700). 78 of the 108 households have no wage or salary income. (Though this data might be inflated by owners of secondary vacation homes in the area, ACS data generally does not account for vacant housing).

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

Maidstone Lake has been densely developed over the last 40 years with over 200 building lots. About 40 households are occupied year-round.[2]

Despite these inflated median household income numbers, almost 50% of the 108 households make at or below the median household income for Essex County ($48,194). This is reflected in approximately the same number of homeowners who are paying at least 30% of their income for ownership costs, with almost 18% paying at least 50% of income on their ownership costs. These underlying disparities suggest that a) land in and around Maidstone Lake State Park is highly desirable, and b) many of the newer developments in Maidstone have come from owners with dramatically increased incomes.

How Maidstone plans for the influx of seasonal vacationers and how those newer homeowners represent prevailing tradition will be areas of general concern.

Parcelization

Additionally concerning development trends within Maidstone include the parcelization of lands. Parcelization is the subdivision of private land into smaller parcels of ownership. This can cause

[1] TRORC Protected Lands and Forest Blocks. https://trorc.maps.arcgis.com/apps/mapviewer/index.html?webmap=95d8a224478343598f6d30c2f46bf9d8

[2] Reclassification of Maidstone Lake Petition, 2021

fragmentation of forested areas through rural residential development, thus disrupting wildlife habitat and threatened ecosystems.

The Vermont Natural Resources Council (VNRC) runs the VT Parcelization website which has tracked parcelization rates in Vermont between 2004 and 2016 on multiple scales. In that span, Maidstone has lost almost 4,000 acres of woodlands in parcels greater than 50 acres (having gone to the "Other" category). *Other* is described as public utility, shore lots, residential building lots (undeveloped), or unimproved lands. This is the third highest increase of this category in the State of Vermont. Parcels are getting smaller in size, with about a 1,000-acre loss of parcels between 100-200 acres.

Land Use

Maidstone's land use values are to remain rural, despite the growth in seasonal housing and parcelization. The town has traditionally been utilized for its timber harvesting with its abundant upland forests. Clear-cutting for residential and subdivision purposes has been highlighted as an issue in the 2016 Town Plan, negatively affecting water quality, forest connectivity, biological diversity, turbidity, and overall aesthetic. Outdoor recreation, such as hiking, fishing, and hunting, has also been a mainstay of Maidstone culture with landowners traditionally and graciously offering access of public use to their private lands. Ensuring preservation of these valued natural lands is a paramount focus for the community.

While almost two-thirds of the town doesn't participate in the labor force, timber production and dairy farming have been traditional mainstays of occupation. With the decline of both industries, employment is varied in multiple sectors. Almost half of the municipal workforce is self-employed.

Maidstone's zoning bylaws contain six distinct districts - Rural Lands 1, Rural Lands 2, Lake, Ponds, Forest and Agricultural. "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."

There are rich and abundant agricultural zoned lands on the west bank of the Connecticut River. Heavy emphasis is made throughout the Town Plan to increase zoning bylaws to protect shorelines, forested lands, and more, including revisions to regulate to the "mean normal water level" to maintain water quality along Maidstone Lake's developed shoreline. Flood Hazard Overlays, buffer strips, and setbacks are also mentioned among Recommended Actions.

Maidstone Lake

Maidstone Lake State Park encompasses 765 acres. The lake itself stretches 279 acres with a maximum depth of about 127 feet. Water flows into the lake from numerous source points, with over 100 culverts embedded in roads that border and feed the lake on approximately two-thirds of the lake's surroundings. The lake is artificially controlled through a dam on the north end of the lake managed by the Vermont Fish & Wildlife. The outflow through the dam forms Maidstone Brook, which flows into Paul Stream and then into the Connecticut River.

Uses and features among the State Park include camping, ice fishing, hiking, birding, snowshoeing, and snowmobiling, with many access routes being offered by private landowners. The hills surrounding the lake rise some 200-300 feet above its shoreline, creating steep slopes.

Field surveys are conducted by the Department of Environmental Conservation (DEC) Watershed Management Division to monitor water quality. Regarded as one of the "few remaining oligotrophic jewels in Vermont "(Maidstone Lake Reclassification Petition), phosphorus concentration levels have increased 43% in the past 25 years, coinciding with the Champion Realty lot sale in 1996 and the parcels' subsequent development.

Other land management entities surrounding the State Park include the Basin 16 Tactical Basin Plan (TBP) and the West Mountain Wild Management Area (WMA). Overall, Maidstone Lake was the only lake to receive a poor nutrient trend on the inland lake scorecard in the TBP. which can be seen here, on page 13.

Natural Resources and Wildlife Species

Undeveloped lands within the State Park are diversely forested with northern hardwood and boreal forests, a natural carbon sequester. Sugar maple, beech, yellow birch, red spruce, balsam fir and others are home to the State Forest, some of which are utilized for timber resources.

Wildlife such as the northern loon, salmon, smelt, trout, white-tailed deer, black bear, moose, and otter utilize this habitat. The Vermont Department of Fish & Game annually stocks the lake with trout and salmon, providing a healthy fishing season. Moccasin flowers are found to bloom within the State Forest, currently on the endangered species list for the State. The Natural Resource Conservation Service (NRCS) identifies federally listed threatened and endangered species as the following in Essex County: the dwarf wedge mussel and the Canadian lynx.

Table 1B.1: Town Statistics

Datum		Source
Population per square mile	6.9	*American Community Survey (ACS) 5-year Estimates, 2017-2021*
Total housing units	334	*American Community Survey (ACS) 5-year Estimates, 2017-2021*
Occupied	108	
Vacant (including seasonal)	226	
Median age	66.7	*American Community Survey (ACS) 5-year Estimates, 2017-2021*
Median home value	$382,100	
Homestead tax rate (per $100)	1.716	*Department of Taxes, Agency of Administration FY 2023. https://tax.vermont.gov/property/education-property-tax-rates*
Non-residential tax rate	1.6849	

Facilities and Utilities

Maidstone outsources all of its service and facility needs, having only the Town Hall building to list for local services which acts and operates as the municipal Emergency Operations Center (EOC). The alternate EOC is located north in Bloomfield at DeBanville's General Store. Services such as a village center, post office, school, store, library, gas station, and doctor's office are utilized in the neighboring towns of Guildhall, Brunswick, Stratford, NH, Northumberland, NH, and Groveton, NH.

Electric Utilities

Maidstone is served by the Vermont Electric Cooperative for the town's electric power. Fairpoint is the main provider for telephone service.

Lack of telecommunication facilities was identified as an issue of concern in the Maidstone Town Plan as well as in survey responses. 2018 5-Year ACS Estimates show that 26.5% of Essex County residents are without reliable internet connectivity.

Water and Sewer

The town has no public water or septic systems. Each homeowner provides their own water through springs or wells and provides and maintains their own septic system.

Solid Waste

Maidstone is a member of the Northeast Kingdom Solid Waste District. Vaughn Hodgdon is currently the hauler, collecting every Monday for trash and recycling. nekwmd.org provides residents with information on what materials are acceptable and how to sort them.

Medical Facilities & Emergency Response

Maidstone residents receive their primary medical care in Lancaster and Groveton, N.H. Doctor's offices are also provided in St. Johnsbury, VT and Colebrook, N.H. The Groveton Ambulance Squad provides ambulance services. Maidstone recorded 18 EMS requests in 2021 and 21 requests in 2020.

Maidstone does not have a fire station or structural firefighting equipment. The town does maintain some forest firefighting tools and equipment, as listed in the Annual Town Report including 8 forest fire outfits, a fire pump kit, 3 two-way radios, and more. Generally, the Town is prepared for fire that meets the community's capacity, yet would be unable to contain anything larger than structure fires. The town relies on the fire stations in Stratford and Groveton, N.H. for fire emergency response. A dry hydrant was installed at Maidstone Lake in 2005. A second one was installed on Route 102 at Cardin's in 2007. A third one was installed on North Road at Wildwood Drive in 2009 and a fourth one was installed at McKenzie's Pond on Route 102 in 2010, though it has been recorded as out-of-service in the 2021 Annual Report.

Maidstone relies on the Essex County Sheriff and the Vermont State Police for law enforcement.

The Maidstone Town Hall is identified as the local emergency shelter. Road connectivity for all residents, particularly those living around Maidstone Lake, is limited for all residents' ability to get to the Town Hall.

Infrastructure

Roads

The Maidstone Town Plan has identified over 24 miles of roads, displayed in Table 1C.2. In September of 2005, the Connecticut River Byway received its national designation. It is the first nationally designated byway in Vermont. This includes all of Maidstone's Route 102. The program can be a source of federal transportation funds to assist with improvements related to tourism or resource conservation. Route 102 is the main traffic artery in the town and is the sole connection to other areas, including New Hampshire. New Hampshire is the nearest location for shopping, groceries, drug stores and health care facilities. There is no public transportation available to Maidstone residents.

The Janice-Peaslee Bridge, formerly known as the Maidstone-Stratford Hollow Bridge, was rehabilitated in 2005 after being closed for 25 years, providing integral access and connectivity to the surrounding areas and the only access road across the Connecticut River in Maidstone. Other access points across the Connecticut River are 9.5 miles north in Bloomfield and 7.5 miles south in Guildhall.

The Town Plan also makes mention of a network of snowmobile trails across private lands as alternative transportation methods, and states within their vision to encourage the expansion of these trails for public use.

Table 1B.2 Maidstone Road Mileage

Class	Description	Mileage
State Highways		8.245
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.	5.93
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.	9.91

Class 4	Roads that the Selectboard may apply some discretion for maintenance. The Town has an adopted policy on Class 4 roads.	4.75
Total	Traveled Highways	24.265

Source: VTrans Town Highway February 2016 (most current)

Given the remote and rural landscape coupled with the disbursement of residents across Maidstone, the overall lack of road connectivity is identified as a vulnerability and reduction of resilience, especially for the multitude of houses congested along the shorelines of Maidstone Lake. Were a hazard to limit route accessibility through flooding or wildfire, many people could find themselves unable to flee the scene and utilize their Emergency Shelters. Specifically, connecting Paul Stream Rd. and West Mountain Pond Rd. at the junction northwest of Maidstone Lake, and Hall Rd and Maidstone Lake Rd at the southeast corner of the lake would increase access and reduce traffic congestion and/or isolation were a hazard to cut off transportation. Connecting these roads to be arterial would be imperative to creating resilient evacuation routes for the community.

The 2021 Annual Report's Highway Fund net change in revenues and expenditures was $-31,508.37, leaving a remaining balance of $281,295.05. The total fund is broken down into three sub-funds: The Highway fund, the Town Road Rebuild Fund, and Clean Water Act. Vermont's Agency of Natural Resources' Clean Water Project Explorer features highlights, and a handful of projects executed within the Town funded by multiple sources, including the VTrans Better Roads Program, the Municipal Roads Grant Program, and the Clean Water Initiative Program. These projects underscore the relationship and importance of road maintenance to water quality.

Culverts, Dams, and Bridges

The Vermont Association of Planning and Development Agencies (VAPDA) houses the Vermont Bridges and Culvert inventory, which stores a database of located culverts statewide and their recorded conditions. The last inventory date recorded in Maidstone was 2012, where 159 culverts were recorded total[3]. Of those, 27 are in poor condition, 12 urgent, and 9 critical. Most of them are run by the Town Highway Fund. There are two distinct culvert systems. One runs along Maidstone Lake Rd., from Browns Mill to Hall Rd. The second system runs the length of Hall Rd. through the extent of North Rd.

There are four bridges in Maidstone. One crosses Cutler Mill Brook on Tamarack Lane, two are on North Rd. also over Cutler Mill Brook, and one on Wildwood Dr.

In the Basin 16 Water Resources, Water Quality, and Aquatic Habitat Assessment Report, there are four dams recorded. Browns Mill and Bull Throat are recorded as Breached, which both are connected to Paul Stream. Stevens Pond's status is unknown, while Maidstone Lake is in service. First built in 1853 to operate a sawmill yet without any record of any conveyed rights for the construction, the dam was rebuilt in 1931 and has since been refurbished in 1948 and 2005. It is now owned by Vermont Fish and Wildlife.

Water Quality

Maidstone is located in the Basin 16 - Upper Connecticut watershed and has multiple source points that feed directly into the Connecticut River. The Paul Stream watershed and the Cutler Mill Brook both flow through Maidstone and into the Connecticut River. Through the West Mountain Wildlife Management Area (WMA) northwest of Maidstone Lake, multiple natural communities and rare plants have been identified and are reported in the Basin 16 Water Quality Assessment Report. Excess nutrient load was identified in Stevens Pond and West Mountain Pond.

The Basin 16 Upper Connecticut Tactical Basin Plan was established in June 2021, which outlines numerous strategies to protect the region's watershed, riparian areas, wetlands, upland forest, and more from development and climate change effects. The plan provides specific focus area studies and priority strategies that can be implemented on a community scale for the Town of Maidstone.

[3] https://vapda.maps.arcgis.com/apps/dashboards/867c764a9a324fd2a1bba98d2edc7e18

Maidstone'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.

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"). Maidstone, 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.

Maidstone has many opportunities and resources at their disposal to strengthen the water quality of their basins, corridors, and lakes. State-funded programs like the Municipal Roads Program, the Clean Water Initiative Program, the Clean Water Fund, the Connecticut River Conservancy, and the Maidstone Bends Preserved, among many other programs and initiatives to help maintain water quality by reducing soil erosion and lake sedimentation, mitigate pests and invasive species, and manage dangerous algae blooms. More info about Conservation groups throughout the region can be found in Appendix D.

Showcasing and coordinating the many resources and conservation efforts that Maidstone has at their disposal will be a priority among mitigation strategies.

Town Governance and Town Properties

Maidstone has a full municipal government, with elected Town Officers that include a three-member Selectboard, and three-member Planning Commission, a Town Clerk, a Town Treasurer, a three-member board of Listers, a Constable, an Emergency Management Coordinator, a Fire Warden, a Health Officer, a Road Commissioner, a Town Moderator, a Town Auditor, and a Town Services Officer. Selectboard meetings are held on the first Monday of each month.

Much of the region's municipal lands is run by either the Department of Forest, Parks, and Recreation or the Vermont Fish and Wildlife. Maidstone State Park was established in 1938, with traditional New England camps built around the lakeshore. The State Park and State Forest combine a total of 475 acres of land, with the adjoining Maidstone State Forest to the south of the lake. Other State-held or non-taxable parcels in Maidstone include the West Mountain Wildlife Management Area (WMA), woodlands protected by the Essex County Natural Resource Conservation District (ECNRCD), two cemeteries, and the Town Hall.

The Maidstone Town Plan (2016) mentions that 80% of the town's tax base comes from Maidstone Lake, highlighting the importance of the quality of the lake to the vitality of the town. The 2021 Annual Report identified $1,169,418.87 of non-delinquent taxes collected, up from $813,018.03 taxes received in the 2016 Annual Report.

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 1B.3 Critical Facilities in Maidstone

Critical Facility	Public Service, Use, Location
North Stratford Fire Department; Groveton Fire Department	Emergency first responders

Essex County Sheriff; Vermont State Police	Law Enforcement
Weeks Medical Center; Groveton Ambulance	Regional primary medical care and ambulance services, Lancaster, NH
Maidstone School District	Based in Concord, VT. Owns and operates a school bus
VT Route 102	Provides critical North-South access
DeBanville's General Store	Bloomfield, VT. Alternate EOC
Maidstone Town Hall	Site of municipal government operation and town records; Primary EOC; Public Notice Location
North Country Union High School	Newport, VT Regional Shelter
Vermont Electric Coop	Electrical transmission lines and infrastructure
Maidstone Lake Association	Neighborhood association committed to the care and health of Maidstone Lake
Janice-Peasley Bridge	Lamoreaux Rd. Sole bridge in Maidstone that crosses the Connecticut River. Emergency vehicle access
Mt. Washington Regional Airport	Whitefield, NH. Closest airport strip
FairPoint Communications	Sole provider of telecommunications in the region
Maidstone Lake Dam & Stevens Dam	Maidstone Lake Dam is operated by the VT Fish & Wildlife. It is unknown if Stevens Dam is operational, or who manages it

Climate Change and Severe Weather Patterns

FEMA describes natural hazards as environmental phenomena that have the potential to impact societies and the human environment. A "large-scale disaster" is one that exceeds the response capability of the local jurisdiction and requires State, and potentially Federal, involvement.

In Vermont, climate change is causing increases in storm intensity and total precipitation. These increases will likely lead to a rise in flooding, water quality and ecosystem impairments, and reduced water-based recreational availability to Vermonters.[4]

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 1986 through 1996, 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, 24 have occurred in Essex County. (See Table 1C.4)

Table 1B.4: FEMA Disaster Declarations in Essex County, FY1964-present

Declaration Number	Declaration Date	Incident Description
DR-160-VT	11.02.1963	DROUGHT & IMPENDING FREEZE
DR-164-VT	03.17.1964	FLOODING

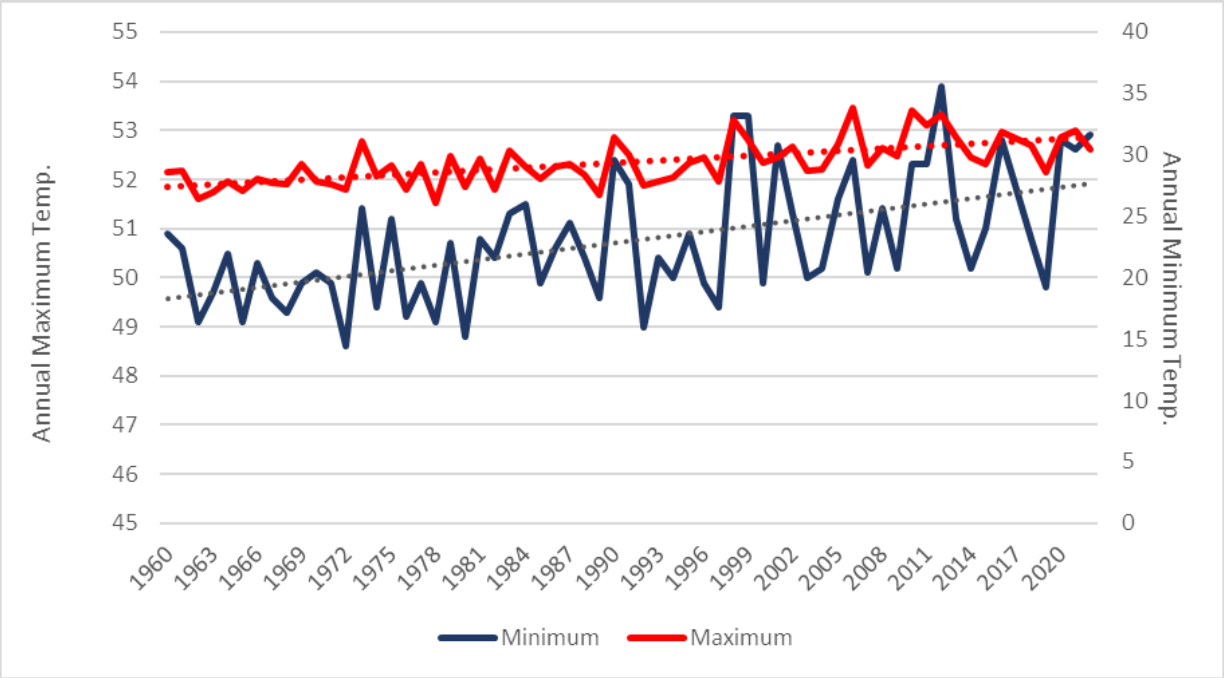
[4] Basin 16 - Upper Connecticut River Tactical Basin Plan

DR-397-VT	07.06.1973	SEVERE STORMS, FLOODING, & LANDSLIDES
DR-840-VT	09.11.1989	SEVERE STORMS & FLOODING
DR-1063-VT	08.16.1995	EXCESSIVE RAINFALL, FLOODING
DR-1228-VT	06.30.1998	SEVERE STORMS AND FLOODING
DR-1307-VT	11.10.1999	TROPICAL STORM FLOYD
DR-1428-VT	**07.12.2002**	**SEVERE STORMS AND FLOODING**
DR-1698-VT	**05.04.2007**	**SEVERE STORMS AND FLOODING**
DR-1790-VT	09.12.2008	SEVERE STORMS AND FLOODING
DR-1995-VT	06.15.2011	SEVERE STORMS AND FLOODING
DR-4001-VT	**07.08.2011**	**SEVERE STORMS AND FLOODING**
EM-3338-VT	08.29.2011	HURRICANE IRENE
DR-4022-VT	09.01.2011	TROPICAL STORM IRENE
DR-4120-VT	06.13.2013	SEVERE STORMS AND FLOODING
DR-4163-VT	01.29.2014	SEVERE WINTER STORMS
DR-4178-VT	06.11.2014	SEVERE STORMS AND FLOODING
DR-4207-VT	02.03.2015	SEVERE WINTER STORM
DR-4356-VT	01.02.2018	SEVERE STORM AND FLOODING
DR-4445-VT	06.14.2019	SEVERE STORMS AND FLOODING
DR-4474-VT	01.17.2020	SEVERE STORM AND FLOODING
EM-3437-VT	03.13.2020	COVID-19
DR-4532-VT	04.08.2020	COVID-19 PANDEMIC
EM-3567-VT	08.22.2021	TROPICAL STORM HENRI

Bolded text denotes public assistance FEMA funding for damage to public infrastructure in Maidstone. Note: FEMA only has public assistance records going back to 1999.

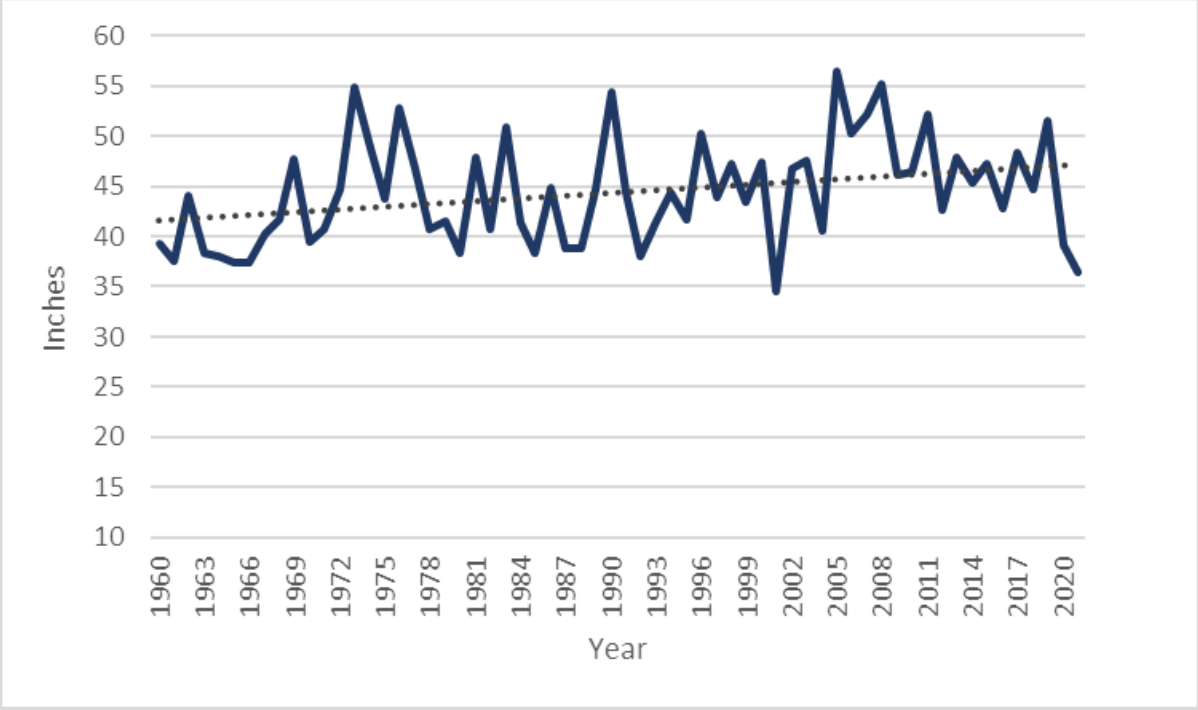
In recent years, it has become evident that human activities, mostly associated with the combustion of fossil fuel, have added to the natural concentration of greenhouse gasses in the atmosphere and are contributing to rapid climate change on a global scale. An analysis of annual minimum and maximum temperatures in Essex County shows that minimum temperatures are generally rising faster (.6°F per decade) than maximum temperatures, (.4°F per decade). (See Figure 1C.1.)

Figure 1B.1: Minimum/Maximum Temperatures in Essex County, 1960-2022



Annual precipitation is rising at a rate of about .9" per decade in Essex County (See Figure 1C.2). 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 1B.2: Annual Precipitation in Essex County, 1960-2022



Sources: NOAA Climate at a Glance

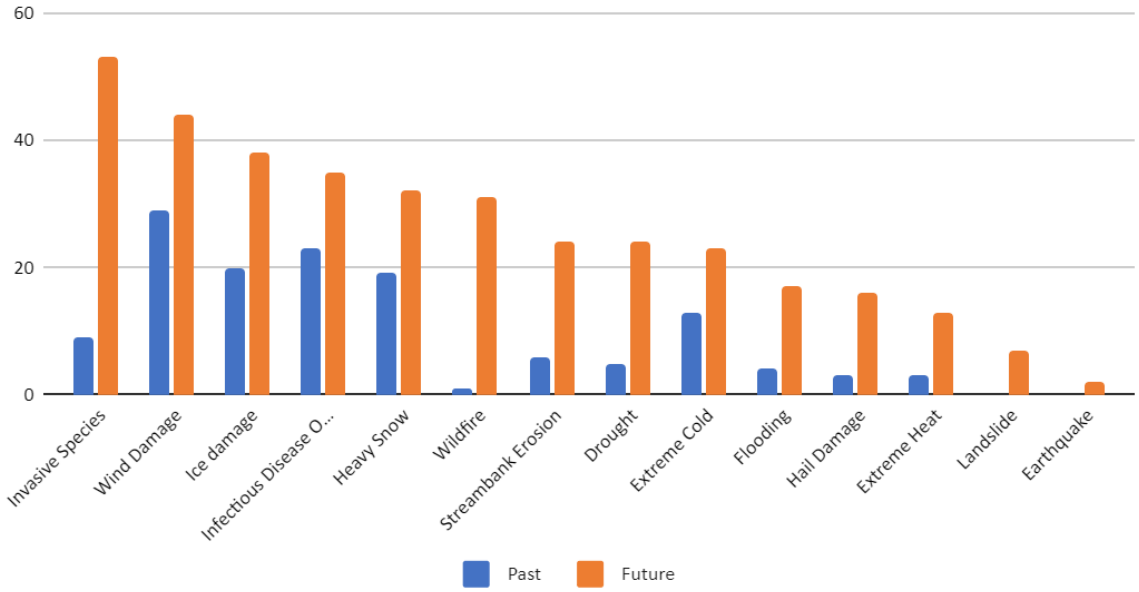
USDA's recent drought disaster declaration in Vermont is not an aberration from the warming trend: According to the University of 2021 Vermont Climate Assessment, increasing variability of rain patterns and water tables makes both flooding and drought likely possibilities. We are moving to extremes: 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.[5]

A community survey was sent out to the residents of Maidstone regarding past experiences of natural disasters along with future concerns. There were 135 responses for past experiences and 359 responses for future concerns (See Figure 1C.4). Of these responses, there was a significant increase of concern in *invasive species* and *wildfire*, highlighting these natural hazards as emphasis of concern for the community's future.

The National Oceanic & Atmospheric Administration (NOAA) holds a storm event database, dating from January 1950 that records episode narratives of the events down to a municipal scale. Heavy winds and flooding were recorded in Maidstone, causing road closures and power outages.

VT Outages, an interactive website that shows power outage data by the hour throughout Vermont, has been recording data since 2008 and can present it down to the municipal scale. Tracking this data has the opportunity to provide context to the vulnerability of Maidstone's energy and possibly correlate that to severe weather events. Power outage data on Maidstone received from them can be viewed in Appendix C. Multiple survey respondents reported power outages from severe storms when asked about adverse effects from hazard events.

Figure 1B.3: Maidstone Survey Respondents: Past Experiences vs. Future Concerns



[5] World Economic Forum: Climate Change is Making Disasters More Expensive.

2. Maidstone Hazards and Potential Impacts

A. Hazard Identification Process

The goal of identifying hazards that are most likely to affect the Town of Maidstone is to ensure that the town's adaptive capacity can meet the extent of damage from a hazard by understanding its likelihood and subsequent vulnerabilities. By analyzing the impact of a specific hazard, we can develop strategies to prepare for, respond to, and recover from these events by leveraging community and regional assets. Some common questions that this plan will address include:

- What are my safe routes to evacuate?
- Where are our emergency resources located?
- Who can I contact?
- How can I be prepared?
- Why are we doing this?

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

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

The tables below represent Maidstone'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 that are based on community input.

To answer the above questions, we assembled data from national and state databases along with community insight on past events. 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. 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. 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.

The working group commenced their assessment with an evaluation of hazards in 2018 Vermont Hazard Mitigation Plan, using the same methodology to determine their highest priority hazards:

Probability x Average impact score = Overall Score

Table 2A.1: Probability and Impact Scoring

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

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

The highest risks to the town 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. Landslides and earthquakes have a low probability and will not be profiled.

- **Location**: General areas in the 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.

Table 2A.2 All Hazards Assessed for Maidstone. Source: Community Survey December 2022

Hazard Impact	Probability	Potential Impact					
		Infrastructure	Life	Economy	Environment	Avg.	Score
Inundation Flooding	4	3.5	3	3.5	2.75	3.2	**12.75**
Ice	4	3.5	3	2.75	2.75	3	**12**
Fluvial Erosion	4	3	2.5	2.75	3.5	2.94	**11.75**
Wind	4	3	2.75	1.75	2.25	2.4	**9.8**
Wildfire	3	2.75	3	2.5	3	2.8	**8.4**
Invasives	3	2	3	3	3	2.8	**8.3**
Drought	3	1.5	2.75	2	3.25	2.4	**7.1**
Snow	3	2.25	2.75	2	1.75	2.2	**6.6**
Heat	3	1.25	3	2	2.5	2.2	**6.6**
Cold	3	1.5	3	2	2	2.1	**6.4**
Infectious Disease Outbreak	2	1	3	2.5	1	1.9	**3.8**
Hail	2	1.25	1.25	1.5	1.5	1.4	**2.8**
Earthquake	1	1.75	2	1.75	1.75	1.8	**1.8**
Landslide	1	1.25	1.25	1	1.5	1.3	**1.3**

B. Risk Assessment - Assets and Vulnerabilities

A risk assessment is the process of identifying hazards, important community assets, and vulnerabilities. Understanding this process will give us tools to quickly identify how a natural hazard can affect the community's vulnerable systems, and which assets are available to resources in each scenario. This section will briefly highlight Maidstone's available assets and existing vulnerabilities.

Assets

Many of the region's assets lie in its environmental qualities, which include its woodlands, surface waters, and rich soiled lands along the Connecticut River. The area houses unique habitat for specific threatened and endangered species, and possesses climate mitigators such as boreal forests, wetlands, and vernal pools. The Town has long cherished these scenic features and is committed to protecting, preserving, and restoring these assets through various opportunities.

Fortunately for Maidstone, the region possesses an abundance of resources and developed conservation projects locally and regionally that can be coordinated with either private landowners or municipal officials. The table in Appendix D highlights the many groups and their respective land management techniques.

The litany of conservation groups available to Maidstone underscores the chief asset of its regional community support. With only one official building in Maidstone, the town's residents are required to rely on adjacent towns for facilities and social services. While this concept does have inherent vulnerabilities, the strength of community support is also a vibrant and resilient asset. Maidstone officials should ensure that all neighboring communities are communicated with and involved in their mitigation strategies and proposals.

The Maidstone Lake Association provides a coordinated group of caring individuals with knowledge, history, and experience of the lake and its surroundings. With Maidstone Lake having the reputation of being one of the cleanest lakes in the State of Vermont, maintaining the ecological functions of this prized natural feature will be a priority when addressing mitigation strategies. The Maidstone Lake Association can offer on-the-ground and historical knowledge, capacity, and support for such endeavors.

Additionally, a helicopter pad has been installed on Maidstone Lake Rd., approximately 2.6 miles from the Route 102 intersection. This asset has the potential to provide assistance to lakeshore dwellers were a catastrophic event to prevent access to and from the area.

Vulnerabilities

Social vulnerabilities can show up in a variety of ways for any community large or small. The State of Vermont measures each census tract with a Social Vulnerability Index (SVI) that is currently based on 2016-2020 American Community Survey (ACS) data. It is a specifically designed planning tool to evaluate and identify populations that may need more assistance during an emergency.

Census Tract 9501 in Essex County, a population of 1,692, is the largest tract in the state with the lowest population density. Roughly 23% of the population are 65 and older, roughly 15% are living in poverty and 7% are unemployed. Just over 40% of the population are single parents.

The following will utilize ACS data in a more detailed scope to highlight the vulnerabilities of Maidstone through its population, economy, environment, and built infrastructure. Observations through the Town Plan and floodplain information will also inform this section.

Population Vulnerabilities

Likely the highest vulnerability among Maidstone residents is that 53.7% of its community are aged 65 or older. While advanced age by itself does not create vulnerability, it is proven that both health problems can become more common and exposure to environmental hazards can be more problematic. Additionally, 19.4% of the community lives by themself, which can isolate them from information, assistance, and resources.

Many residents of the community are faced with low-income, poverty, and/or cost-burdened situations. Of the 108 households occupied in Maidstone, 29 of them (27%) have a household income below $35,000. 29 households are paying at least 30% of their income on ownership costs, while 19 households are paying at least 50% of their income on ownership costs. 9% of families in Maidstone have income below the poverty level, and 14% of the total population has a ratio of income to poverty level under 1.00.

Lastly, the fact that about two-thirds of Maidstone's housing inventory is left vacant for either secondary vacation homes or short-term rentals has multi-ranged effects on the vulnerability of the region. Were a natural disaster to hit at a time when the majority of these houses were seasonally occupied, the capacity of the Town's response to a natural disaster would be heavily impacted.

Economic Vulnerabilities

Maidstone does not possess many economic vulnerabilities due to the fact that there are very few businesses within municipal limits. However, the fact that the Town does not have a Town Center limits their capacity to shelter, provide amenities, and destination to evacuate.

Environmental Vulnerabilities

The threats of fragmentation of forested lands through the parcelization of privately owned lands is an environmental vulnerability. Native ecosystems, animal habitat, contiguous forests, old-growth, and endangered and threatened species are all compromised by this trend. The increased development pressure on lake shorelines can also increase the potential for declined water quality, in particular algae blooms. There are a number of endangered and threatened species habitats within Maidstone. Habitat along wetlands and lakes could be threatened by flooding, erosion, and wildfire.

Built Infrastructure Vulnerabilities

Maidstone has limited resiliency concerning heating, power, and road infrastructure connectivity. Additionally, lack of telecommunication facilities has been highlighted as an issue in the Town Plan. 20% of the population in Census Tract 9501 in Essex are without internet connectivity.[6]

Since 2008, there have been 25 instances of power outages recorded in Maidstone due to downed trees or weather, causing outages for over 100 meters often. Over half of the houses within Maidstone utilize fuel oil as their house heating fuel, while only 12% use wood. Relying on one source of heating becomes a vulnerability when there is no back up source. The Town is not supplied with a backup power source or generator to assist, furthering vulnerability issues were the Town Hall needed as an Emergency Shelter.

The limited road connectivity mentioned above in the community profile presents a dangerous vulnerability for households that are remote. Designing workable evacuation routes require secondary options, and without connectivity of arterial roads for a community, access could be cut off in the event of a wildfire or flood.

C. Hazard-Specific Information for Profiled Risks

1. Flooding (Inundation and Fluvial Erosion)

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

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.

To summarize the hazard in Maidstone, there are numerous inundation points along various arterial roads from all three types of flooding addressed in this section (inundation, flash, and fluvial) that could affect access, emergency response, and evacuation from an event. As storms become more frequent, erratic, and intense, infrastructure liabilities such as road quality, culvert quality, and streambank stability have and will continue to exacerbate the impact of these extreme, yet increasingly common weather events.[7]

Upper Connecticut (Basin 16): Maidstone is within the Basin 16 - Upper Connecticut Basin, which stretches from Canaan to Barnet, encompassing 482 square miles while sharing responsibilities of the basin quality with New Hampshire. Basin 16 comprises multiple sub-basins that drain into the Connecticut River north of the Passumpsic confluence. Maidstone has three main drainages into the Connecticut River – Paul Stream, Wheeler Stream, and the Maidstone-Guildhall Direct Drainage.

[6] Internet Connectivity Across the US, ACS 2018 (5-year Estimates). https://www.socialexplorer.com/755178c094/view
[7] Vermont Climate Assessment, 2021

Maidstone also possesses a number of Class II wetlands, much of it residing in the West Mountain Wildlife Management Area (WMA). The Vermont Agency of Natural Resources (ANR) produces strategic guidebooks for all basins in Vermont called a Tactical Basin Plan (TBP) aimed to protect public health, safety, and climate adaptation.[8]

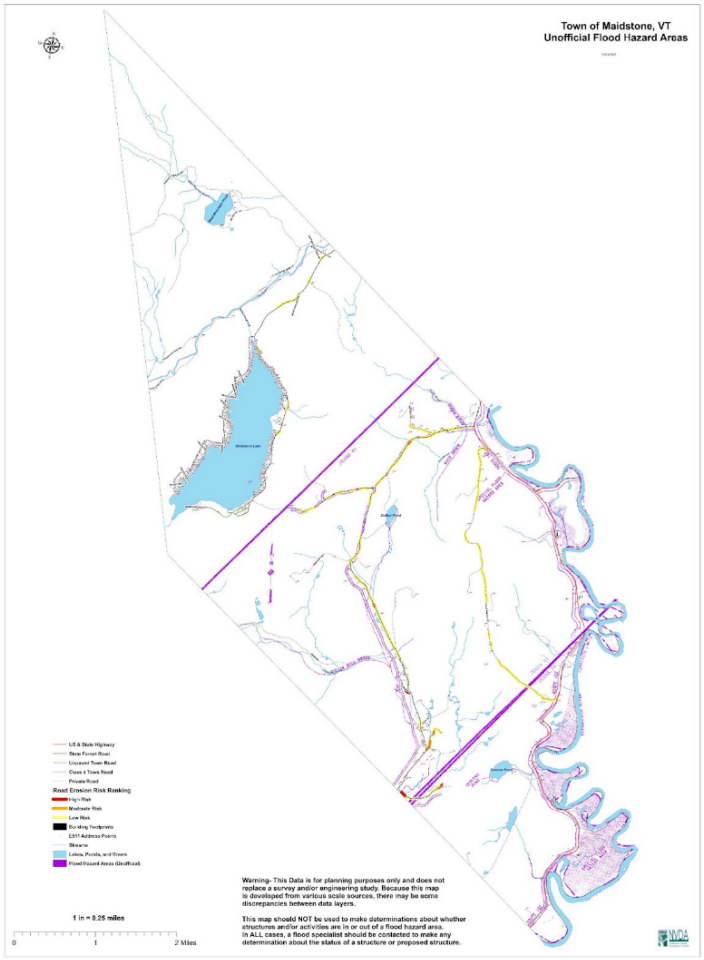
The Basin 16 TBP addresses channel straightening and alterations, and the removal of riparian vegetation as main causes of increased erosion along the Connecticut River. Conversely, restoring large wood load habitat within upland streams and riverbanks can improve floodplain connectivity and reduce sedimentation.

Inundation Flooding

Inundation flooding is when heavy precipitation and ice jams cause streams, rivers, and culverts to spill over into adjoining low-lying lands called floodplains. It occurs during significant levels of precipitation from rainstorms, thunderstorms, 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.

This risk is associated with moderate to severe community-scale impact due to damage to personal property, businesses, and road access disruption, leaving roads impassable due to standing water. Major community-scale environmental impacts may be due to sedimentation deposit, loss of crops, and loss of water quality.

Figure 2C.1.1. Special Hazard Flood Area, Town of Maidstone



Source: NVDA

The Flood Insurance Rate Map (FIRM) for Maidstone was prepared in 1974 from a Flood Hazard Boundary Map. It consists of areas east of Route 102 along the Connecticut River and depicts areas of inundation flooding (Figure 2C.1.1). This area represents what is considered to be the 100-year floodplain, an area that has a 1% annual chance of flooding, though at what level of flooding these events are inconclusive due to lack of data. Because FEMA did not conduct a Flood Insurance Study, the age of the maps and lack of detail make it difficult to determine how many structures may actually be prone to flooding. In 2009, a Letter of Map Amendment was issued to remove a structure in the Special Hazard Flood Area (SFHA) indicates that the base flood elevation along Route 102 is at 863.4 feet.[9] The Town Plan speculates about 15 homes in or near flood hazard areas, while Figure 2C.1.1 exhibits about 18 structures in the SHFA. Meanwhile, the ANR Flood Hazard

[9] Letter of Map Amendment Determination Documentation, 2009

Summary Report counts 5 structures in the SFHA.[10]

Maidstone does not have flood hazard regulations and therefore does not participate in the National Flood Insurance Program (NFIP). This both prohibits homeowners from qualifying for FEMA-based flood insurance from the national government and lowers the eligible amount that the Town can receive from the State-funded Emergency Relief and Assistance Fund (ERAF) from 12.5% to 7.5%.

If the Town commits both to participating in the NFIP (assuming the adoption of this LHMP) and to protecting river corridors, Maidstone will be eligible for a 17.5% state match of Federal Public Assistance from declared disasters. Not participating in these leaves millions of dollars of potential aid off the table for the community.

Were arterial roads such as Route 102 cut off due to inundation flooding and erosion, evacuation routes would be compromised and access to essential services in nearby towns limited. A lack of dependable broadband connectivity could exacerbate hazard situations with a limited access to emergency information.

Most of the flooding that Maidstone 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.

One tool to address flash floods locally is by using the Vermont Association of Planning & Development Agencies (VAPDA) VT Culverts GIS database. Assessing culverts in conjunction with community experience can pinpoint local induration points during a flash flood, icing conditions, or other hydrologic events. There are 27 in poor condition and nine culverts in critical condition: eight of them along Maidstone Lake Rd. and one on North Rd. In particular, the culverts near the dam at the north point of Maidstone Lake is a chief vulnerability.

Of the 24 FEMA-declared hazards in Essex County, 17 were incidences of flood and severe storm. Maidstone has received public assistance from FEMA 12 times from severe storm floods. The damage was primarily to roads and bridges with the total assistance equaling $163,374. The NOAA Storm Event database has more details about flooding events from 1965 to the present, where they've recorded 20 flooding events since 1996, amounting to a total of $2,633,000. As the county with the highest Social Vulnerability Index (SVI) in the state (predominantly socioeconomic vulnerabilities), the cost to property damage against floods presents an extreme vulnerability of resilience. Table 2C1.1 gives the one significant flood event recorded specifically to Maidstone within the NOAA database.

Table 2C.1.1 Significant Flood Events in Maidstone

Date	Episode Narrative	Damage
10/1/2010	On September 30th, an area of low pressure moved north through the mid-Atlantic states. Southerly flow ahead of the low tapped into deep tropical moisture, including moisture associated with the dissipated remnants of Tropical Storm Nicole. Heavy rain spread into Vermont late on September 30th and continued October 1st, and eventually produced four to five inches of rain.	Flood waters forced the closure of Route 102 through Maidstone.

Source: NOAA Storm Database

Fluvial Erosion

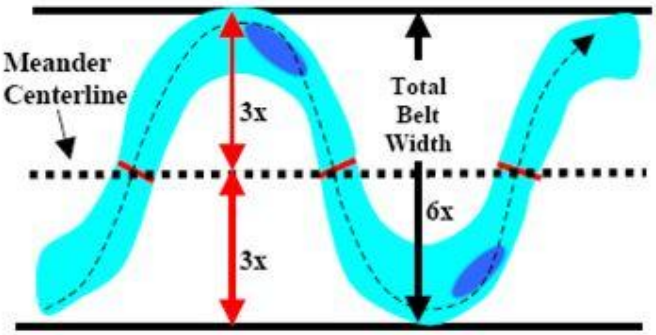
Fluvial erosion is the natural process of the wearing away of soil, vegetation, sediment, and rock from the river channel bed and banks by the action of water. When river channels are altered by humans or nature, the river must readjust to reach its former balance. The rate of erosion is affected by local soil type, slope, precipitation, volume, and velocity of river discharge. Other natural or human activities accelerate the

[10] Maidstone Flood Hazard Report Summary, Flood Read Vermont

natural rate of erosion, such as large storm events, removal or alteration of riparian vegetation, modification of runoff flow patterns, and physical alteration of land within the floodplain and the active river area (i.e., logging, agriculture, dairy farming).

The more common mode of damage is associated with the dynamic, and often catastrophic, physical adjustment of stream channel dimensions during storm events. These adjustments are often due to bed and bank erosion, debris and ice jams, or man-made structural diversion failure. Fluvial erosion can lead to moderate to severe community-scale damage to infrastructure, which includes washed out roadways. Major community-scale impacts to the environment 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.

Figure 2C.1.2. River Corridor Meander Belt



Depiction of Meander Belt Construction

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

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, yet only about 20% of the State's streams have been mapped. These risk areas are defined by Vermont Statute as "River Corridors," land area adjacent to a river that is required to accommodate the conditions of a naturally stable channel that is necessary for the natural maintenance or restoration of a dynamic equilibrium condition. Given the complexity of shape, scale, and political boundaries, the Connecticut River has not yet been mapped by ANR.

Paul Stream and Cutler Mill Brook are charted in the ANR River Corridor Maps. Analysis of these maps conclude that there are approximately 11 structures within these river corridors.

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 riverbank adjustments. 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 2C.1.2)

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. Such development and streambank alteration are a strong factor in fluvial erosion events. 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.

A fluvial geomorphic assessment was conducted along the Connecticut River in 2004. It identified the main cause of erosion and channel instability was due to human channelization and straightening, and mentions that a riparian buffer could improve bank stability significantly.

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

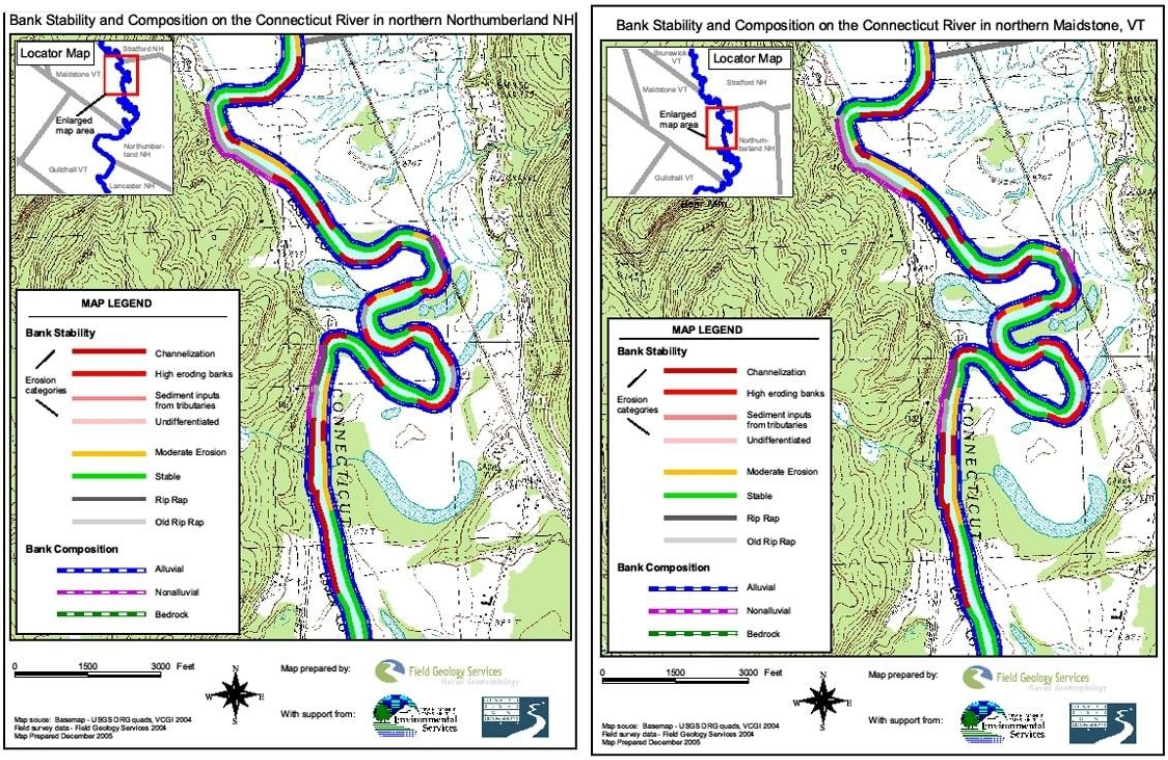
hazards and to regulate activities exempt from zoning and local land use regulations under the Flood Hazard Area and River Corridor Rules. Municipalities are strongly encouraged – but are not required – to regulate development in the river corridor as part of their flood hazard regulation. Given the amount of sediment load and river instability along the Connecticut River, there are significant advantages to adopting river corridor regulations.

The Department of Environmental Conservation (DEC) Road Erosion Inventory reporter map, which is an interactive town highway segment map that shows that standard of roads that meet the Municipal Roads Grant Program (MGRP) standards, shows numerous segments along North Rd. and Maidstone Lake Rd. do not meet standards. Over 50% of Maidstone's completed road segments either partially meet or do not meet road standards. The segments that do not meet MGRP road standards create a vulnerability to fluvial erosion.

Numerous other interest points of erosion have been identified or mentioned in the community survey, interviews, noted within the Town Plan, or from national storm databases. They include Route 102 just north of the Guildhall border, Westside Lake Rd, North Rd. along Dutton Brook, the intersection of Hall Rd. and Route 102, Lamoureux Rd. to the Janice-Peaslee Bridge, Tamarack Ln., and numerous other points on Route 102. Many survey respondents have further raised concerns with lakeshore erosion and overall shoreline stabilization around Maidstone Lake.

Despite these points of concern, there is little direct available information on the history and extent of fluvial erosion within Maidstone's town boundaries. However, *Riverbank Erosion Comparison along the Connecticut River* (2012) displays multiple levels and visual representations of erosion, offering site comparisons from 1997-2008. Figure 2C.1.3 below displays bank stability and composition on the portion of the Connecticut River that flows through Maidstone.

Figure 2C.1.3.Bank Stability and Composition on the Connecticut River through Maidstone



Source: Riverbank Erosion Comparison along the Connecticut River (2012)

Table 2C.1.2: Flood Hazard Summary Table

Location	Vulnerabilities	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	Poor and critical culverts. Poor road quality infrastructure Maidstone Lake dam Developed shoreline on Maidstone Lake. Up to 18 structures located in floodplains, and 11 in river corridors. Lack of communication and emergency response capacity	Inundation points at Maidstone Lake Dam, Paul Stream, and along Maidstone Lake Rd has the potential to cut off hundreds of seasonal visitors Flood hazards along Route 102 pose a significant threat to access and services. Damage and debris to roads and bridges; flooding to residential properties; stream bank collapse. Lakeside erosion	**Major**: $163,374 in severe storm and flood damage in FEMA-declared assistance. $2,633,000 in county-wide property damage recorded by NOAA. Road closures to Route 102. Structure removal in the SFHA. Property damage reported by survey respondents	**Highly likely**: >75% in any given year

2. 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:

- 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.

The National Weather Service (NWS) has a new prediction tool called the Winter Storm Severity Index (WSSI). 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. Utilizing this tool can be helpful in winter weather severity predictability.

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

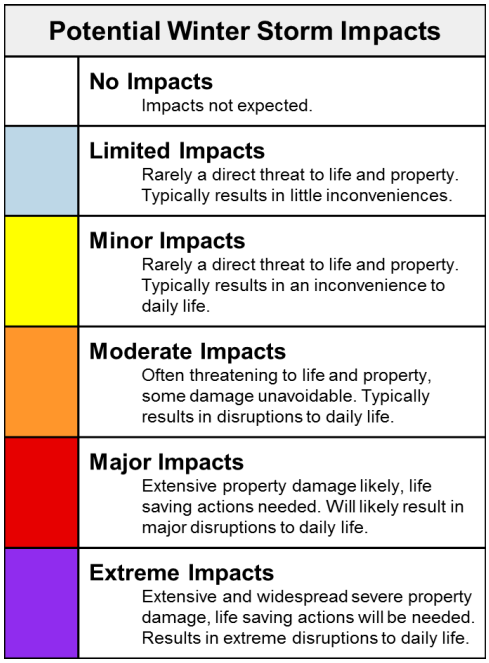


Figure 2C.2.1. NWS Winter Storm Severity Index Impacts.
Source: National Weather Service

Based on Vermont Climate Assessment (VCA), which provides a framework for understanding climate change impacts in Vermont, average winter temperatures are warming at a rate over twice as fast as summer and fall temperatures (+3.3°F). The state's days with maximum temperatures < 0°F have decreased by over 10 days since 1960. Lastly, Northeastern Vermont has experienced the most accelerated change in the length of freeze-free period since 1991 at 9.6 days/decade.[11]

This has brought a decline in snowfall during the same time period, yet an increase in total precipitation as a greater portion of winter precipitation is falling as rain rather than snow. These warming winter

temperatures followed by arctic air masses have the propensity to create mass freeze-overs at a wide scale, intensifying ice damage and strain on infrastructure, trees, and property, as evidenced in both survey respondents and power outage data from VT Outage (appendix C).

Essex County is no stranger to cold, icy winter conditions. NOAA's storm database has recorded 247 Winter Weather & Winter Storm events since 1996 in Essex County, accumulating a total of $5,806,000 in property damages.

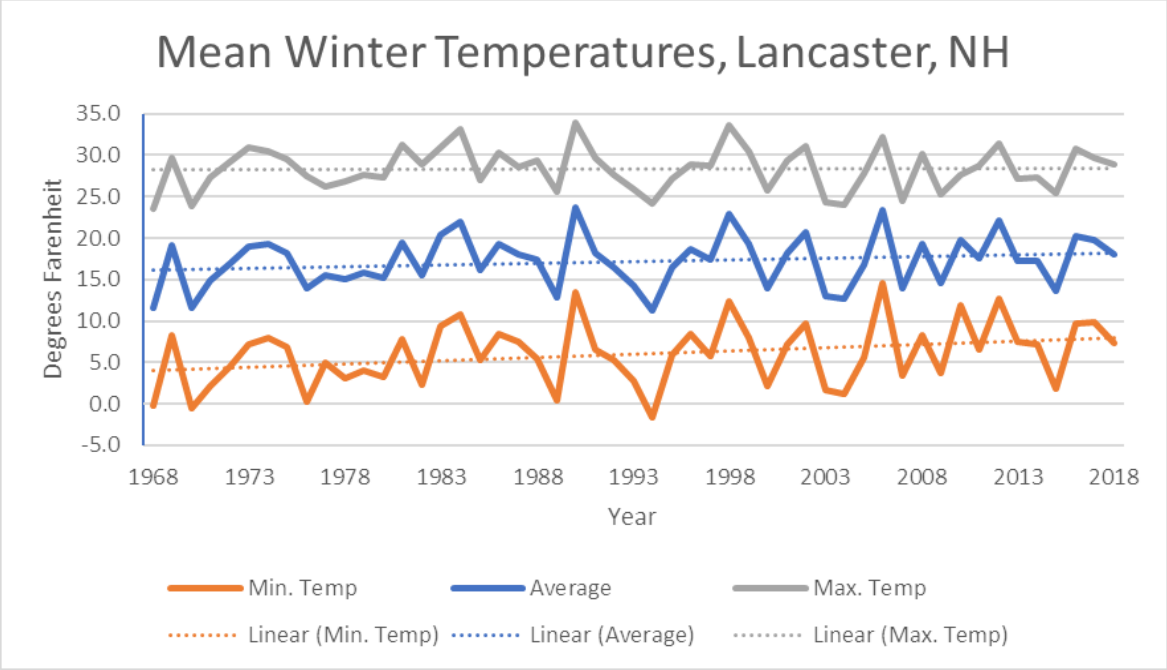
NOAA defines a *winter storm* as an event that has one significant winter weather hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24-hour warning criteria for at least one of the precipitation elements.

Cold

Figure 2C.2.2 depicts historic winter temperatures in nearby Lancaster, NH (the closest available data to Maidstone). Averaging the mean temperatures of the minimum, average, and maximum temperature of winter months (December-February) confirms that minimum temperatures are indeed rising at a quicker rate than maximum and average temperature.

[11] Vermont Climate Assessment, 2021

Figure 2C.2.2. Historic Mean Winter Temperatures, 1968 to 2018.



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 2C.2.1 suggests that sub-zero temperatures are beginning later into winter and ending earlier, whereas maximum temperatures over 32 degrees are ending sooner in the season.

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. Extreme cold temperatures can further cause heavy strain on sole-source heating systems.

Table 2C.2.1. First and Last Temperatures in Lancaster, NH, 1968-2019

Minimum Temperature Under 0			**Maximum Temperature Over 32**		
	Last Day of Year	First Day of Year		Last Day of Year	First Day of Year
Minimum	Feb-07 (2010)	Nov-22 (2018)	Minimum	Jan-01 (2019)	Dec-03 (1970)
Mean	Mar-15	Dec-12	Mean	Jan-6	Dec-27
Maximum	Apr-01 (1969)	Jan-17 (2007)	Maximum	Feb-03 (2009)	Dec-31 (1992)

Source: NowData (National Weather Service)

Neither the NOAA Storm Events Database nor the FEMA Declaration Summaries database covered damages or instances of extreme cold weather specific to Maidstone. However, NOAA has recorded 22 instances of "cold/wind chill" in Essex County, including reports of cold wind chills 25 to 40 below zero and the Record Cold February for much of Vermont in 2015. In these instances, damage to infrastructure,

frozen water mains, and dead vehicle batteries. 25% of survey respondents reported being affected by extreme cold weather, including damage from frozen pipes.

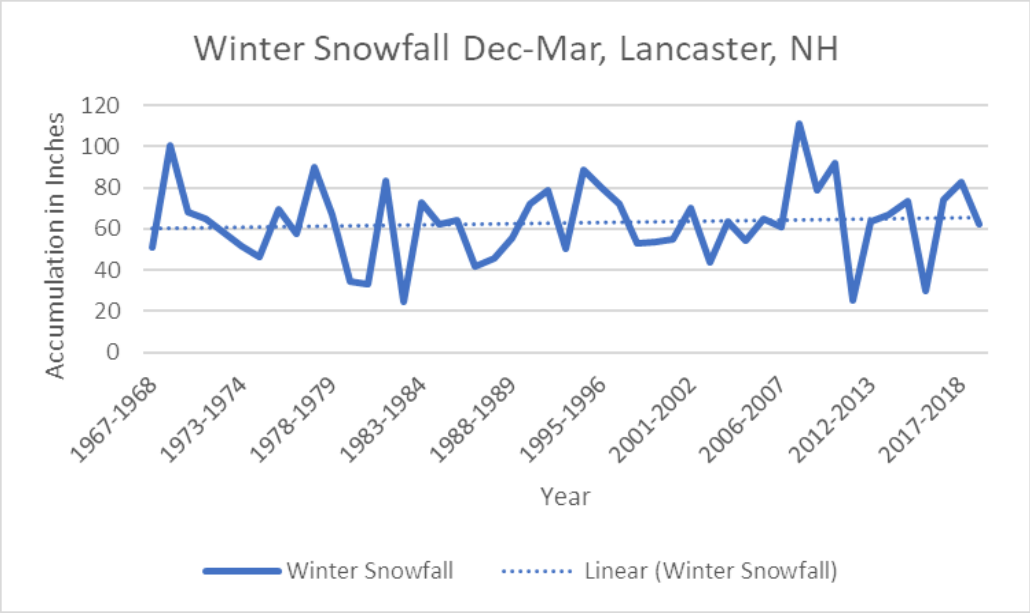
Those who are especially vulnerable to the impacts of extreme cold are residents in older structures and energy-burdened households. According to the most recent American Community Survey 5-year estimates (2021), 40% of Maidstone housing units were built before 1970 and 23% built prior to 1940. Older 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%, Maidstone's overall energy burden is considered "lowest" at 7.6%.[12]

Snow

In general Maidstone residents 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 restrictions in road and driveway access in the past according to survey responses.

Bucking the state trend of declining snow, the Northeast Kingdom and its surrounding areas have received relatively little change to their accumulation of snowfall, trending at a slightly increased annual rate (see Figure 2C.2.3). In fact, as precipitation has increased northeastern Vermont has experienced average annual snowfall 24 inches higher in the 2010's than in the 1930's.

Figure 2C.2.3 Winter Snowfall (December-March) for Lancaster, NH, 1968-2018



Source: NOWData, NOAA

Essex County's snow season can extend from October through May, with the heaviest monthly snow accumulations in December. However, the largest snowstorms can still occur in February/early March. The mean average snowfall for the entire season in Lancaster, NH (from 1991-2020) is 76.1".

The nearest, most complete data on snowfall and accumulation is in Lancaster, NH. The mean number of days per year with 1" or more of snow cover is 114 days. The maximum number of days with snow cover was in 1972 at 148 days, and the minimum was in 2016 with 62 days.

[12] Efficiency Vermont: 2019 Energy Burden Report

Though NWS data is often with gaps, 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.

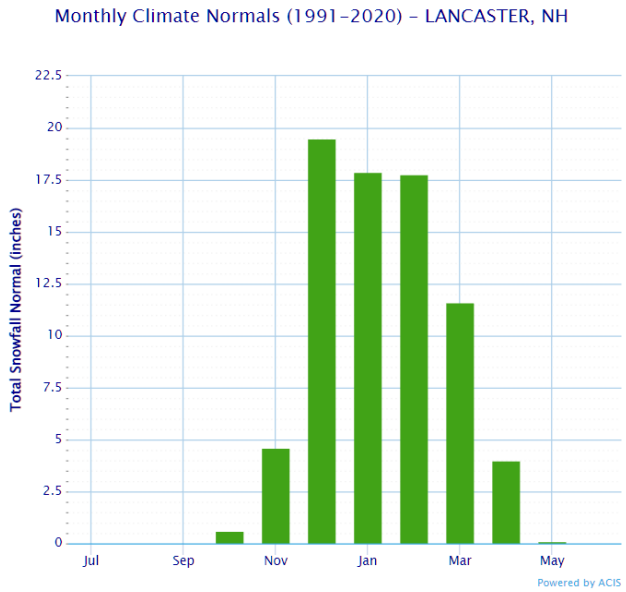


Figure 2C.2.4. Total Snowfall by Month, Lancaster, NH, 1991-2020
Source: NowData, National Weather Service

Since 1997, there have been seven instances of Heavy Snow storm events recorded in Essex County within the NOAA database, resulting in $136,000 in property damages . "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 24 hours or less.

Table 2C.2.2: Heavy Snow Events

Date	Episode Narrative	Total Property Damage
12/01/1997	An area of low pressure off the Middle Atlantic coast Sunday night (11/30/97) moved to near Cape Cod early Monday (12/01/97) and continued to move northeast thereafter. Snow and freezing rain developed during late Sunday night (11/30/97) and continued in the form of periods of snow Monday (12/01/97) into early Tuesday (12/02/97). Several traffic accidents were reported. East Haven (Essex county).....14.0 inches	$5,000
12/25/1997	A storm system in the Great Lakes region early Thursday (12/25/97) moved northeast into Canada during the day. Another storm developed off the New Jersey coast early Thursday (12/25/97) and moved northeast to coastal Maine Thursday night (12/25/97). The precipitation began as mixed snow, sleet and freezing rain but changed quickly to snow with the heaviest snow in northeast Vermont. West Burke (Caledonia county) reported 7.0 inches and Victory (Essex county) reported 8 inches. A few traffic accidents resulted. Also, a few power outages were reported in Caledonia county the night of 12/25/97.	$5,000
3/21/1998	A storm system along the Virginia coast on Saturday (March 21) moved slowly northeast into the Gulf of Maine late Sunday and Sunday night (March 22) . Snow was heavy Saturday night into Sunday morning with a number of traffic accidents reported and brief power outages. The snow tapered off to snow showers Sunday night. Snow accumulations were generally 15 to 20 inches across northwest and north central Vermont with around a foot elsewhere across the area. The heaviest	$5,000

	report was 25 inches at Jay Peak near the border of the Vermont counties of Franklin and Orleans. Island Pond (Essex county).....10.0 inches.	
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. This included the western slopes of the Green Mountains in the Eastern portions of both Addison and Chittenden counties and northwest Windsor county. A few reports were: Canaan with 7 inches, South Lincoln reported 6.2 inches, Eden with 6 inches, East Albany with 5.5 inches and Hanksville with 5.2 inches. A few of the mountain peaks received higher amounts.	$1,000
2/14/2007	Low pressure developed across the lower Mississippi river valley on the morning of the 13th and moved into the central Appalachians by the early morning hours of the 14th. During the early morning hours of the 14th, a coastal low quickly developed near the Delmarva peninsula and rapidly intensified, as it moved northeast across southeast Massachusetts and into the Gulf of Maine by the evening of the 14th. Snow moved into southern Vermont around midnight on the 14th, then overspread the rest of Vermont during the early morning hours. 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 inches 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 degrees below zero or colder. Snowfall totals ranged from 15 to 25 inches in the Connecticut river valley to 20 to 35 inches elsewhere across Vermont. The National Weather Service office in South Burlington set an all-time record 24 hour snowfall of 25.3 inches, breaking the old mark of 23.1 inches set on January 14, 1934. In addition, the storm total of 25.7 inches was the 2nd heaviest storm total snowfall on record, behind the 29.8 inches received on December 25th through 28th, 1969.	$100,000
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 inches 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 Essex county.	$10,000
02/13/2014	A Winter storm, responsible for record ice and snow across the southeast United States on February 12th, moved and redeveloped off the southeast United states 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.	$10,000

	Snowfall across Essex county was 10 to 20 inches with 10 inches in Island Pond and 20 inches in Averill.	

Source: NOAA Storm Database

Ice

Ice accumulation is becoming a regular concern for winter weather, especially with rapidly fluctuating temperatures in winter months coupled with rising temperatures. 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. Numerous survey respondents reported property damage, power outage from downed limbs or trees, and frozen culverts as damage received from ice.

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 snow, hiding the icy layer beneath. NOAA winter storm records show one ice storm in Essex County, in Table 2C.2.3, causing $80,000 in property damage. FEMA has recorded one "severe ice storm" in Essex County, on December 20th, 2013.

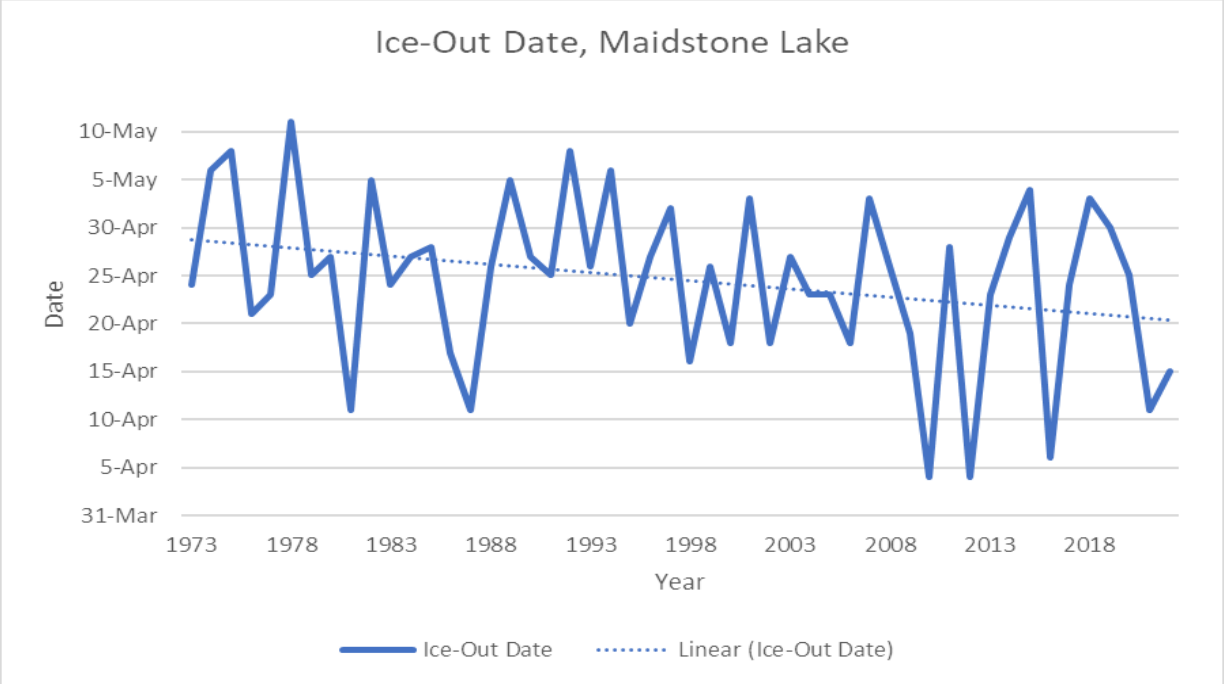
Table 2C.2.3: Ice Storms in Essex County

Date	Episode Narrative	Total Property Damage
01/06/1998	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. Ice accumulations during this event were generally 3/4 of an inch 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 with several 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 a number of 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

Source: NOAA Storm Database

The Maidstone Lake Association has also been recording Ice-out dates on Maidstone Lake since 1973. The lake has seen a trend of losing its ice earlier in the year, with the earliest being April 4th in 2010 and 2012 (Figure 2C.2.5).

Figure 2C.2.5: Ice-Out Date at Maidstone Lake, 1973-2022



Source: Maidstone Lake Association

Table 2C.2.4: 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.	January, 2022. Cold wind chills of 25 to 40 below zero.	**Major:** Burst water pipes and flooding; school cancellations and delays; outdoor recreation events canceled. $1,853,000 in property damages due to winter storms recorded by NOAA	**Highly Likely**: > 75% in any given year
Snow	Town-wide	Roofs prone to collapse from weight; Single-person households unable to leave house.	10-25 inches of snowfall along Connecticut River, 02/14/2007. Heavy snow restricted access to driveways and heating propane.	**Moderate:** $136,000 in property damages recorded by NOAA storms	**Highly Likely**: > 75% in any given year
Ice	Town-wide	Road accidents, Power outages from downed tree limbs, Limited evacuation routes. Burst water pipes	1998 ice storm. Shoreline ice damage, property damage, culvert freezes, power outages from fallen limbs.	**Major:** Extended power outages; lost income from dairy operations; road accidents; carbon monoxide from	**Highly Likely**: > 75% in any given year

				improper use of generators.	

3. Wind

Typically rare, Vermont has begun to see the effects of increased thunderstorm winds as evidenced during Tropical Storm Irene in 2011 and the Halloween flood of 2019. Excessive windstorms can affect the region year-round and are often accompanied by other storm factors.

Most recently, the Halloween storm of 2019 produced both significant floods and high winds, resulting in washed out roads and culverts, with over 120,000 people affected by power outages.[13] Dangerous combinations of power outages and access roads cut off can lead to pronounced isolation and severely limited emergency response in rural regions such as Maidstone.

High windstorms present a severe threat to loss of life, property, and crop damage. Forest and sensitive habitat can be upheaved in structure and composition. Infrastructure is commonly affected through downed trees that result in prolonged power outages and road closures. Additionally, the random nature and various accompanying impacts windstorms possess present a difficult challenge to respond from.

Maidstone residents frequently experience downed trees and power outages from wind as well as occasional structural damage. Wind damage was the hazard residents felt most affected by in the last ten years (51%), with anecdotal reports of 90 mph winds and multiple instances of downed trees, power outages, and property damage. Hindrance to access their work life along with concern over an alternate evacuation route for lake residents were voiced as primary outcomes of concern.

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 Maidstone.

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 2C.2.5: 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.

[13] The Halloween 2019 Significant Flooding and High Wind Event

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

Though increasing, hurricanes are rare in Vermont, as are tornadoes. There have been 49 tornadoes recorded in Vermont since 1951, the closest to Maidstone being an EF0 in 1988 near Lyndonville. Tornado wind speeds are recorded using the Enhanced Fajita Scale (EF) which are marked by the following speeds:

Table 2C.2.6: Enhanced Fajita Wind Scale

EF Rating	3 - Second Gust (mph)
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	Over 200

The National Oceanic and Atmospheric Administration (NOAA) lists three types of wind events that have affected Maidstone from 09/01/1965 to 09/30/2022:

- **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 87 thunderstorm wind events recorded in the NOAA database within Essex County, with winds recorded as high as 78 kts (2000, in Canaan) and total reported damages to property equaling $523,000.
- **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 22 events reported in the NOAA Storm Event Database Essex County that resulted in $293,500 in reported property damages. Many resulted in mass 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 10 high wind events in the NOAA database for Essex County, resulting in $250,000 in damages.

The most damaging winds that Maidstone experiences are "straight line" 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 2C.2.6).

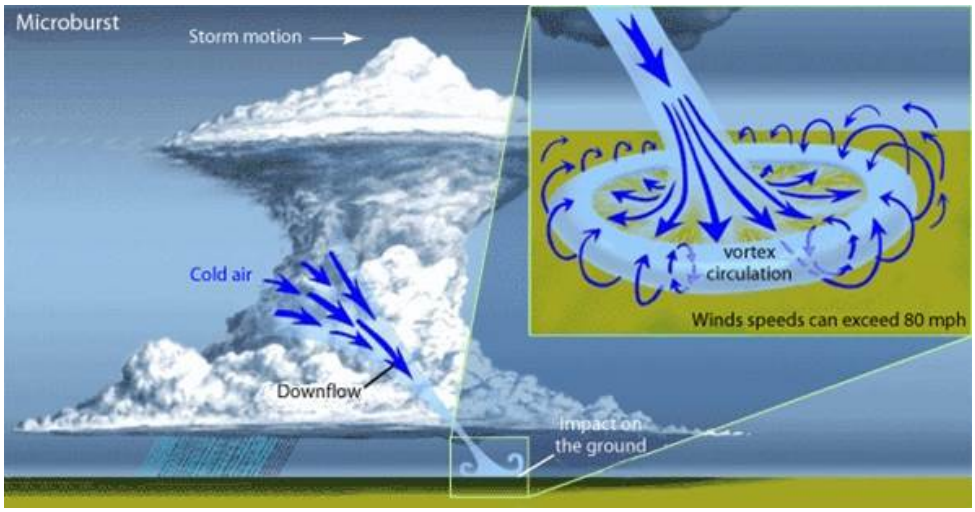
Ideal conditions for microbursts occur in hot humid conditions and can be exacerbated by instability, high levels of precipitative water, and converging air in the middle of a thunderstorm. It occurs when large amounts of water or hail are suspended in the updraft. Evaporation, cooling, and sinking air 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.

FEMA does not categorize declared disasters by wind alone.

Figure 2C.2.7: Microburst



Source: NOAA

Table 2C.2.6. Significant Wind Events in Maidstone, 1990 to present

Date	Type	Magnitude	Description and Impacts	Property Damage
4/27/1994	Thunderstorm wind	N/A	N/A	$5,000
8/25/2007	Thunderstorm wind	50 kts	A very warm, humid and unstable airmass was located across Vermont during the afternoon of the 25th, with temperatures in the upper 80s to lower 90s and dewpoints around 70 degrees. A surface cold front was located across Ontario and Quebec, with a mid-atmospheric disturbance that moved across the North Country during the afternoon and early evening. This triggered numerous thunderstorms in New York, that intensified as they moved across Vermont. An unseasonably strong wind field aloft fueled the development of severe thunderstorms that produced widespread damaging winds and some large hail across central, southern and eastern Vermont. Some of the hardest hit communities included Barre (Washington county), Rutland and vicinity (Rutland county) and Woodstock (Windsor county).	$15,000

			Numerous trees down throughout Maidstone State Park.	
5/18/2007	Thunderstorm Wind	50 kts	Record setting heat set the stage for an moderately unstable air mass, while a mid-level atmospheric disturbance provided the forcing and strong winds to develop scattered thunderstorms by late afternoon into early evening, some of which produced damaging winds and hail. A strong micro-burst produced 80-100 mph winds and destructive hail in West Addison with a seasonal camp destroyed with one occupant receiving minor injuries. More than 15,000 customers were without power due to storms across VT.	$0
7/21/2022	Thunderstorm Wind	50 kts.	A moderately strong shortwave and surface cold front moved across a moderate to highly unstable airmass across VT during the early afternoon hours of July 21st. Scattered thunderstorms developed and quickly intensified, some producing damaging winds and hail with one supercell that moved across Orleans and Essex counties with several reports of large hail, up to golf ball size and some scattered tree damage.	$5,000

Source: NOAA Storm Database

Table 2C.2.7. 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; road blockages and limited emergency response	Microburst on 5/17/14 with winds approaching 65 kts. Thunderstorm in Essex County with winds in excess of 90 mph (78 kts).	**Major:** Trees lost, roads blocked, power outages, structural damage to houses and farm structures, and automobile. NOAA Storm Event Database reports $20,000 in damages to Maidstone and $1,066,500 in damages county-wide.	**Highly Likely**: > 75% in any given year

4. 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

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.

As temperatures tend to increase and snowpack decreases, forest floors have the propensity to be literal hotbeds during periods of drought. Forested areas with heavy brush, downed trees or limbs, and clear-cutting swaths of land provide ample fuel for wildfire. During episodes of increased volatile winds, wildfires can produce unprecedented disaster outcomes for regions unaccustomed and therefore unprepared for such a hazard.

The risk for wildfire is usually greatest in the spring and fall, shortly after snowmelt extends into the beginning of June and prior to the rain setting back in during September. During these periods 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. Monitoring fire danger can be viewed here. 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 contributes to the risk.

Though every fire is innately unique due to conditions, topography, and loss, the National Wildfire Coordinating Group has establish a scale for classifications of burns as follows:

Class A - one-fourth acre or less;
Class B - greater than one-fourth acre, but less than 10 acres;
Class C - 10 acres or more, but less than 100 acres;
Class D - 100 acres or more, but less than 300 acres;
Class E - 300 acres or more, but less than 1,000 acres;
Class F - 1,000 acres or more, but less than 5,000 acres;
Class G - 5,000 acres or more.

While wildfires have not been a historical hazardous threat to Vermont and the Northeast Kingdom, the magnitude of young forests coupled with warming trends and declining snowpack leaves the likelihood of such events to increase. Vulnerabilities include aged population due to severely impaired air quality, being stranded from road closures, and vast destruction of sensitive habitat. Wildfires also create prolonged periods of dense smoke, inhibiting air quality affecting everyone's breathing capacity. Most importantly for Maidstone is the limited access to Maidstone Lake with no alternative route, as approximately 40 homes are occupied year-round.[14] However, if a wildfire episode were to occur at the height of population during the summer months (over 200 lots on lakeshore), evacuation capacity for one route would present a severe complication.

Specifically, to Maidstone, northern hardwood and boreal forests that are distinct to both Maidstone State Park and West Mountain WMA could be more susceptible to fire were drier conditions to increase and persist.[15] Maidstone's 2022 Annual Town Report reported 3 wildland fires within town limits, and 1 listed in the 2021 Annual Town Report. 5 burning permits were issued during the year. While the majority of residents (98%) responded not having experienced or been affected by wildfires, over 60% of residents were at least mildly concerned about future impacts of wildfire.

Neither FEMA nor NOAA have any fires recorded in their databases for Essex County. Beyond the fires that were reported in the Annual Reports, no known wildfires have directly impacted Maidstone and its

[14] Reclassification of Maidstone Lake Petition, 2021
[15] New England and Northern New York Forest Ecosystem Vulnerability Assessment and Synthesis: A Report from the New England Climate Change Response Framework Project

surrounding areas. Given the poor road accessibility and connectivity along with unique, hilly topography, the extent of a wildfire within Maidstone could be an extreme challenge to control.

Table 2C.3.1. Wildfire Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Townwide (town is approximately 90% forested)	Aged population; residents with limited alternate route access. forested areas; sensitive habitat. Smoke inhalation for any sensitive populations	Occasional brush fires, but minimal history of wildfire in Maidstone.	**Negligible**- Though future conditions likely to increase	**Likely**: >10% but < 75% in any year; at least one chance in next 10 years

5. Invasive Species

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

Invasive species are defined as plants, insects, and other organisms that were either accidentally or intentionally introduced from other places and that can negatively impact agriculture, recreation, forestry, human heath, the environment, and the economy. Invasive plants, which are categorized as either terrestrial or aquatic, can cause environmental devastation by changing soil composition, loss of forest productivity, 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.

Many long-term effects can be brought on by the presence of invasive species. Causal relationships to other hazards, such as flooding, ice storms, and wildfire that can open forest canopy, can increase the prevalence and introduction to both invasive plants and insects. They can completely alter sensitive ecosystems by acting as a major driver of forest change.[16] Through this increased competition native tree species, especially in boreal forests that are present in Maidstone State Park, are projected to have reductions in suitable habitat because of this incursion.

Human activity can often 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 stream banks and areas beyond, choking out native plant communities and destabilizing banks.

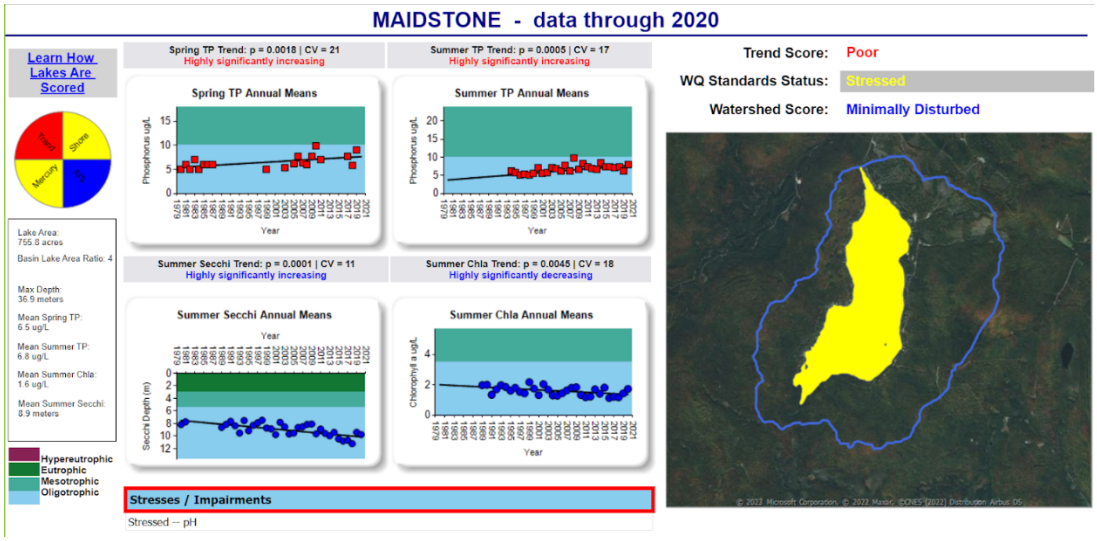
Climate change significantly contributes to the spread of invasives. For example, warmer temperatures weaken native species such as maple, yellow birch, and American Beech, while allowing forest pests such as the hemlock wooly adelgid to overwinter and reproduce.

For the purposes of culture, history, recreation, housing, and economy, Maidstone Lake and its surrounding forests' health are vital to the community's identity and wellbeing. Though still regarded as one of the cleaner lakes in Vermont, nutrient loading has become an issue through increased phosphorus. Nutrient loading provides more food for various algae blooms. Algae blooms diminish available

[16] New England and Northern New York Forest Ecosystem Vulnerability Assessment and Synthesis: A Report from the New England Climate Change Response Framework Project

dissolved oxygen, creating water quality issues, affecting recreational opportunities as well as a large portion of the economic tax base, and presents a significant health threat to both fish species and humans.

Figure 2C.4.1. Maidstone Lake Scorecard



The background colors in each of the four graphs below show how Maidstone Lake is trending from the clear nutrient free oligotrophic lake (light blue) we all love towards a lake which less clear, has more plants, more nutrients, and is more welcoming to invasive species, a Mesotrophic lake.
Sources: Department of Environmental Conservation (DEC) Watershed Management Division. Maidstone Lake 2020 Annual Report

The Department of Environmental Conservation (DEC) Watershed Management Division has assessed water quality through a Lay Monitoring Program since 1979. The image above (Figure 2C.4.1) was taken from the DEC scorecard website, indicating stressed water quality standards from increased alkaline levels that are trending poorly. Spring and summer phosphorus rates have been slowly increasing. While Maidstone Lake remains one of the cleanest lakes, its increase in pH is likely a result of increased wastewater discharge and can have the potential to reduce lake diversity.[17]

Fortunately, the Maidstone Lake Association has a long history of care and capacity. In addition to petitioning a lake reclassification and development of watershed management plan, the Association participates in both the boat Lake Greeter Program as well as the Shoreline Monitoring Program. To date, both programs have yet to identify the presence of invasive species. However, Eurasian Milfoil has been located in Stevens Brook as of 2021.

Education and outreach are critical to the effective management of invasives. Vermont Invasives (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 wooly 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 Maidstone is imminent.

[17] Addy, Green, and Herron. pH and Alkalinity, University of Rhode Island, July 2004. http://cels.uri.edu/docslink/ww/water-quality-factsheets/pH&alkalinity.pdf

Survey respondents were most concerned with invasive species above all other hazards (85% at least "mildly concerned"), with the highest sample of the survey population being "very concerned" (26%).

Table 2C.4.1: Invasive Species Identified in Maidstone 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 grown 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 Stevens Brooks as of 2021. 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.
Asian Lady Beetle	Very similar to ladybugs with different shapes and coloration. Likely have played a major role in the disappearance of many native Lake Beetle species.
Curly-leaf Pondweed	Submersed plants with a distinct, wavy appearance. Only pondweed with toothed edges; can grow 4-5 feet tall. Thrives in polluted and eutrophic waters and can be an indicator of declining water quality. Grows in dense strands that can restrict the growth of native plants and deplete nutrients. High impacts to water recreation.

Table 2C.4.2: Invasive Species Hazard Summary Table

Location	Vulnerability	Extent	Potential Impact	Probability
Town wide, with habitats specific to individual species, such as roadways, wetlands, forests. Maidstone Lake, Stevens Pond, and associated brooks	Boreal forests, hardwoods, agriculture, waterways, native species; economic vulnerability to tax base of Maidstone Lake. Capacity issues volunteering for shoreline and greeter programs.	Eurasian milfoil in Stevens Brook. Invasives identified in table 2B.7.1 by residents and Conservation Commission. Japanese knotweed and emerald ash borer likely imminent.	**Major:** Decreased water quality in lakes Compromised natural habitat, including streambanks and forests. Compromised soil stability along waterways.	**Highly Likely**: > 75% in any given year. High likelihood of future impact.

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 Maidstone. 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. In 2020, farmers reported at least $27 million in crop losses from the growing season drought of that year.[18]

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. Three out of ten Vermont households get their drinking water from private wells, and about 60% of Vermonters rely on groundwater for drinking.

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.

Table 2C.5.1: Drought Severity Table

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

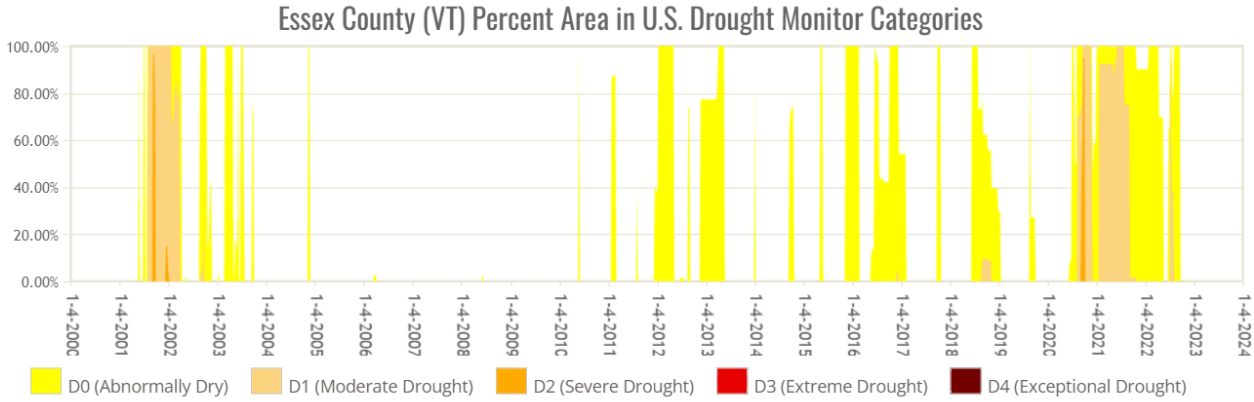
Source: U.S. Drought Monitor https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx

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, Essex County has recently experienced the longest period of dry/drought conditions in decades (Figure 2C.5.1). All of Essex County experienced a minimum of abnormally dry conditions (DO) from July 2020 through March, 2022. Nearly all of Essex County experienced moderate drought (D1) from September 2020 to November, 2021. Minor portions of the county also experienced severe drought (D2) from September to October of 2020.

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.

[18] Vermont Climate Assessment, 2021

Figure 2C.5.1: Drought Conditions in Essex County, 2000-Present



Source: US Drought Monitor

The Agency of Natural Resources maintains a crowd-sourced database called the ANR Drinking Water Drought Reporter.
https://vtanr.maps.arcgis.com/apps/CrowdsourceReporter/index.html?appid=3f0dd46b0add49c0b8010bb76107e354

The database does not identify any water outages or shortages for Maidstone. 5 respondents to the survey indicated they had been affected by drought in the past 10 years with one respondent reporting drying wells around the region and another witnessing effects in their garden and orchards. 26 respondents were "mildly concerned," whereas 3 respondents were "very concerned" about future impacts from drought.

Based on the Multi-Indicator Drought Index (MIDI) developed by the National Integrated Drought Information System (NIDIS) as well as 2021 Vermont Climate Assessment, episodes of droughts are likely to increase. Though experimental, the MIDI long-term outlook projects more drought conditions in Essex County than compared to other counties in the state.

Table 2C.5.2: Drought Risk Summary Table

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

7. Heat

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

Heat events impact air quality and worsen air pollution. Heat waves create stagnant air that traps pollution particles that are then breathed in. Increased temperatures also increase the likelihood for drought, which dries out vegetation. This vegetation is then more susceptible to wildfire, which also lowers air quality once burned and emitted into the atmosphere.

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

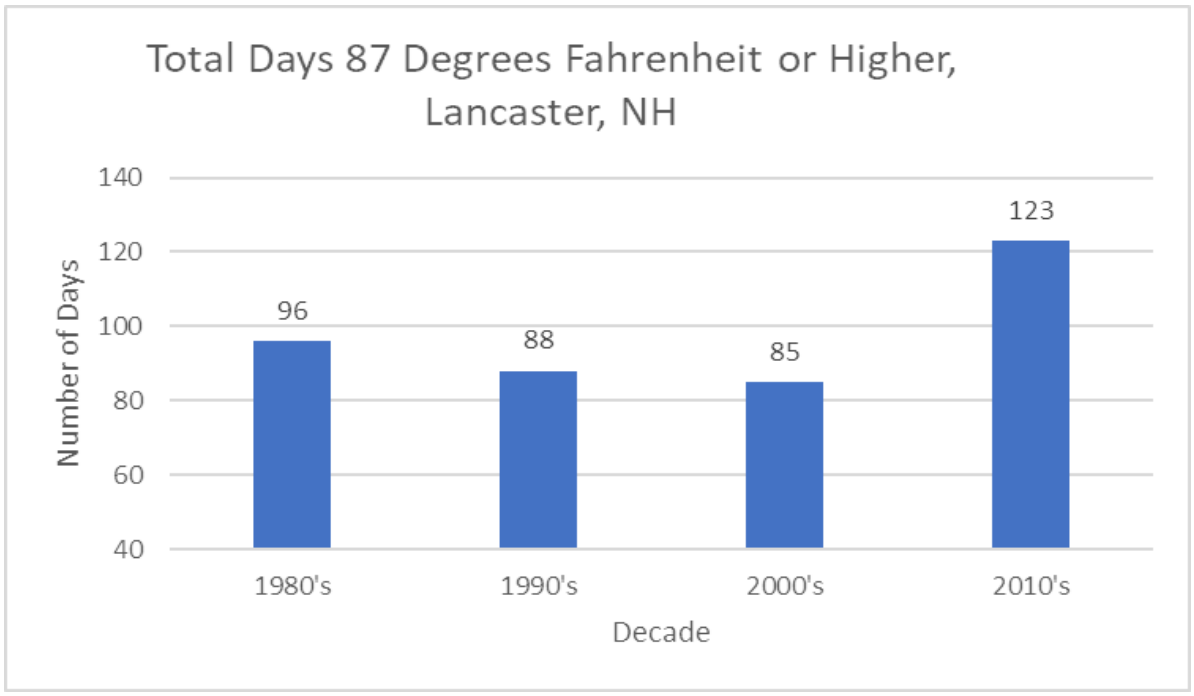
conditions such as heart and respiratory disease, leading to death.[19] The impacts of extreme heat can be particularly challenging in regions such as the Northeast Kingdom where residents are not accustomed to high temperatures and are less likely to live in air-conditioned structures.

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°. The primary impact of extreme heat or prolonged periods of hot weather is to human life. Heat conditions 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.[20] Working with the Vermont State Climate Office, the Vermont Department of Health analyzed 14 years of temperature and mortality data, and ten years of 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 these days, reaching at least 87°F as compared to cooler days.

The NOAA Event Database has three extreme heat events for Essex County, the first beginning in 2006 (See Table 2C.6.1). July is traditionally the hottest month of the year in Maidstone with the greatest number of days over 87°, but hot days can occur from May through September, with occasional outliers as early as April.

Figure 2C.6.1. Total Days by Decade reaching 87° F or Higher in Lancaster, NH



Source: NOWData, NWS

[19] Centers for Disease Control, Heat Related Illness: Picture of America Report

[20] Vermont Department of Health: Heat Vulnerability in Vermont, Local Indicators of Heat Illness Risk. 2016.

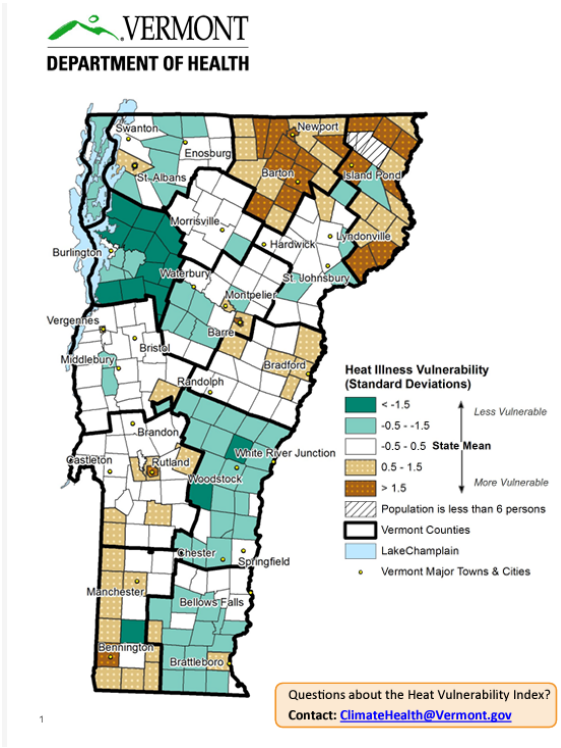


Figure 2C.6.2. Vermont Heat Vulnerability Index
Source: Vermont Department of Health

Using 87° as a standard, the hottest July recorded by the NWS NOWData for Lancaster, NH was 2018, with 9 days reaching 87° or more with a mean monthly maximum temperature of 83.2°. (Complete records for Lancaster go back to 1978.) Additionally, Lancaster has seen a significant increase in total days reaching 87° or higher by decade, as evidenced in Figure 2C.6.1.

The Vermont Department of Heath anticipates a statewide increase to an average of 33 days per year by the end of the century.[21] Responses from the Maidstone Hazard Mitigation Survey align with this projection: Three respondents to the Maidstone Hazard Mitigation Survey indicated they had been "adversely impacted" by extreme heat events, although no respondent provided details of the impacts they experienced. 15 respondents indicated a concern about future extreme heat events.

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 has some of the highest concentrations of communities with high heat vulnerability indices. The Vermont Heat Vulnerability Index (Figure 2C.6.2) draws on 17 different measures from six different themes: population, socioeconomic, health, environmental, and heat illness. Both Orleans and Essex County possess the most vulnerable populations due to high historic incidence of heat illness and lack of heat acclimation. Maidstone's heat vulnerability index resides between 0.5-1.5.

While excess summer heat in Maidstone 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 Danville's lakes and ponds, as well as restrict available oxygen levels for fish and aquatic species. Low water level and warming of stream and lake water can also change physiological stability in fish or limit suitable habitat, inducing mass die-off.

Table 2C.6.1. Extreme Heat Events in Essex County

[21] Vermont Department of Health: Vermont Climate and Health Profile Report: Building Resilience Against Climate Change in Vermont, September 2016

Date	Episode Narrative	Crop Damage
8/01/2006	A "heat ridge" moved into Vermont during the early morning hours of the 1st. This "heat ridge" was part of a strong, upper level area of high pressure that brought record heat to a large majority of the country since mid-July. In Vermont on the 1st, afternoon temperatures soared into the 90s, but significantly more important were dewpoints that reached the middle to upper 70s to produce excessive heat index values of 100 to 105 degrees, some of the highest values in nearly a decade. Actual maximum temperatures recorded for the 1st included; Union Village at 95 degrees, Burlington at 94 degrees, St. Johnsbury, Middlebury and Springfield at 93 degrees, Morrisville at 92 degrees, Montpelier and Rutland at 91 degrees.	$0
3/17/2012	The Winter of 2011-12 was largely abnormal with temperatures that averaged 4-5 degrees above normal and snowfall was 40-60 percent of normal. This combination accounted for snow packs across the region to be largely below normal or even non-existent by mid-March. In Mid-March, a huge, upper atmospheric ridge dominated the eastern half of the lower 48 states, which allowed for unprecedented RECORD heat from the northern Plains and Mississippi River Valley to the Atlantic coast. In fact, thousands of daily record maximum temperature records were broken during this time frame. In Vermont, temperatures reached the mid 50s to lower 60s on March 17th, then climbed into the 70s on the 18th with 70s and lower 80s on the 19th through 22nd. The normal high temperature during this period is the mid 30s to lower 40s. These record temperatures combined with Winter 2011-12 conditions accounted for the Maple Sugaring industry to end by the last week of March. Preliminary estimates of a 30 percent loss in the maple sugaring industry or approximately 250,000 gallons at a market rate of $40/gallon or approximately a $10 Million loss statewide. In addition, but not accounted for in damage estimates, is the loss revenue of the ski industry during the winter due to a 25-50 percent snow drought and early spring closures.	$500,000
7/01/2018	A dangerous heat wave, one of which likely hasn't impacted the North Country in decades occurred between June 30th and July 5th. High temperatures exceeded 90 degrees for at least 5 of the six days in many locations were above 85 degrees for 7 days. Heat indices, the combination of temperature and humidity, were recorded in the 100 to 110 range considered excessive and very dangerous. A substantial increase in hospitalizations occurred due to the excessive heat and duration and at least 4 deaths were attributed to the heat. Burlington VT witnessed the warmest 5 and 6 Day Consecutive stretch since records have been kept in 1892. Also, the ALL-TIME warmest minimum temperature was recorded on July 2nd of 80 degrees, breaking the old record of 78 degrees. High temperatures in the upper 80s to upper 90s with dewpoints in the 60s and 70s created dangerous heat indices in the 95 to 110 degree range between June 30th and July 5th. Increased hospitalization visits occurred due to the dangerous heat.	$0

Source: NOAA Storm Database

Table 2C.6.2: 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 and agricultural crops	July 2018, with 9 days 87° or higher	**Moderate:** $500,000 in county-wide crop damage, 03/17/2012 Increased hospitalizations due to heat-related illness (VT Dept. of Health data), four heat-related deaths reported statewide in the summer of 2018	**Likely**: >10% but < 75% in any year; at least one chance in next 10 years

8. 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 January 6th, 2023, the Vermont Department of Health reports that there have been 877 COVID deaths in Vermont. The death toll is based on death certificates that list COVID as a cause or probable cause of death. Essex County was fortunate to have only 1,461 reported cases with 4 related deaths. The Department of Health does not publish death counts at the municipal level. 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 Maidstone 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.

Half of the towns' survey respondents reported being adversely affected by infectious disease outbreak, with seven specifically citing the pandemic. Some felt associated effects with increased costs to run businesses and lost time from work.

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)[22] 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 experienced 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.[23]

Table 2C.7.1: 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.	**Major:** 1,461 cases reported, 4 confirmed deaths in Essex County. Widespread alteration of life & communication	**Highly likely**: >75% in any given year

9. Hail

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 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.

Hail storms occur infrequently in Vermont and it is not clear that climate change will increase their frequency. The NOAA Storm Events Database reports 13 hail events in Essex County since 1964, but because hail storms tend to be extremely localized no events were reported in Maidstone.

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. Six respondents to the Maidstone 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.

[22] Feeding America. What is Food Insecurity?
[23] University of Vermont. Food Security Impacts of the COVID-19 Pandemic: Following a Group of Vermonters During the First Year

Table 2C.8.1. Hail Hazard Summary Table

Location	Vulnerability	Extent	Observed Impact	Probability
Town-wide	Local growers	Fruit-bearing trees damaged for season	**Negligible**	**Highly Likely**: > 75% in any given year

D. Hazard Specific Information for Non-Profiled Risk

Earthquake

The risk of earthquakes is quite low in Vermont -- low enough that it is not prudent to invest in mitigation. According to FEMA Seismic Hazard Maps, Maidstone (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.

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." Landslide risk is a possibility along the steep cliffs along route 102 down into the Connecticut River, and could be exacerbated by fluvial erosion and/or heavy rain events.

3. Mitigation Strategies

A. Mitigation Goals

The mission for this plan is to create a disaster resilient Maidstone. With focused attention towards preparedness, response, and recovery. Through increased public awareness and community engagement, coordination with resource restoration management groups, and identifying actions to build a safer, more resilient community, the following goals can be achieved:

- 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 establishments due to disasters.

This section of the plan satisfies 44 CFR §201.6(c)(3)(i-iv) Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?

- 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.
- Protect natural and cultural resources.
- Increase cooperation and coordination among private entities and local, state, and federal agencies.
- Increase awareness, engagement, and education within Maidstone and surrounding communities.

B. Evaluation of Mitigation Strategies

In support of these goals, the Maidstone Hazard Mitigation Planning Team presented a set of proposed mitigation actions for consideration to the Local Hazard Mitigation Plan Committee in a meeting on April 10, 2023. 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 Maidstone Hazard Mitigation Planning Team grouped proposed mitigation actions into three categories for implementation:

- **Continual:** Mitigation strategies that are already implemented and are within the town's capacity to continually maintain with little to no change in capacity.
- **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.

Table 3B.1 Mitigation Strategies and Actions

All Hazards					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Ensure that the Local Emergency Management Plan is kept up to date.	Selectboard and Planning Commision	Continual	$	Hazard Mitigation Grant Program (HMGP) Building Resilient Infrastructure and Committees (BRIC) Pre-Disaster Mitigation Grant (PDM)	*This was voiced as being continually met and updated. Due annually near June.* NVDA In conjunction with the annual LHMP review.
Ensure the Town web site serves as a reliable source of information in an emergency, including contacts, evac routes, and EOC's. Consistently post information and resources for each specific hazard listed in this plan. Utilize other forms of communication, including community board posts and Facebook (Maidstoners for Life)	Town Clerk	Near-Term	$	Town Budget	*This was voiced as an area of interest, however concern was brought up people's access to the internet and navigating information online. More conversation can be had on pursuing a communications strategy for emergency events.*
Establish and distribute Maidstone Emergency Contact List	Selectboard	Near-term (within 24 months)	$	Town Clerk/Budget	*There is already a list established for emergency contacts on the website, however consensus was*

					established to enhance the level of information for emergency situations. I.E. Primary and Secondary Local shelters, evacuation routes, and other additional sources. NVDA can provide support to build this based on the LHMP.
Consider implementation of lake setback and erosion-prone regulations.	Selectboard	Long-term	$		*There is interest in this as a long-term strategy, and much work is already in shoreline restoration through Essex County NRCD. However, issues arose in getting community members aligned with intentions as well as enforcement of any such regulations.*
Ensure the Primary Local Shelter is stocked with adequate supplies, including cots, blankets, and MREs. Increase amenities and capacities as needed.	Selectboard, Emergency Management Coordinator	Near-term (ongoing)	$$	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Grant (PDM)	*This was apparently promised to the Town 10-15 years ago, yet the State has yet to fulfill that promise. NVDA will attempt to address this so that Maidstone has the appropriate level of support for community members in need.*
Explore funding sources and opportunities to improve telecommunications	Planning Commission	Mid-term	$	Hazard Mitigation Grant Program (HMGP) https://nekbroadband.org/	NEK Broadband *The Town should encourage the community to pre-register at large to get Maidstone on the priority list for*

					establishing broadband service
Flooding and Fluvial Erosion					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Support flood mapping updates and review new flood map information as it becomes available.	Planning Commission	Near-Term (6-12 months)	$	Community Recovery and Revitalization Program	Agency of Natural Resources, NVDA – Both will provide technical assistance
Continue to identify and map Maidstone's natural flood protection assets, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forest areas.	Planning Commission	Continual	$$	Flood Resilient Communities Fund (FRCF) Flood Mitigation Assistance (FMA) Hazard Mitigation Grant Program (HMGP) Building Resilient Infrastructure and Committees (BRIC)	Agency of Natural Resources; floodready.vermont.gov; *This is identified as a long-term strategy to gain more understanding of the floodplain and flood hazard areas, assist and protect residents from loss of property, and prepare themselves for qualifying compliance National Flood Insurance Programs in anticipation of the new FEMA flood maps*
Reevaluate the flood regulations to consider continued compliance with the National Flood Insurance Program (NFIP). Consider regulations that will protect erosion-prone and floodwater storage areas from additional development and encroachment.	Planning Commission	Long-term (36 months)	$$	Flood Resilient Communities Fund (FRCF) Flood Mitigation Assistance (FMA) Better Roads Grant Program Hazard Mitigation Grant Program (HMGP) Building Resilient Infrastructure and Committees (BRIC)	Agency of Natural Resources, NVDA, basin planners; grants include Municipal Planning Grants, and 604(B) water quality programming *The Committee is interested in pursuing information for national flood insurance once FEMA maps are released to better understand special hazard flood areas (SHFA) and the*

					buildings in this area. The committee would like to prepare themselves for the eventual release of the new flood maps to make the best decision for the town with the right information. Capacity, information availability, and enforcement are issues preventing this.
Explore appropriate implementation for River Corridor protection within the town plan to qualify for ERAF.	Planning Commission	Long-term (36-60 months)	$$	Flood Resilient Communities Fund (FRCF) Flood Mitigation Assistance (FMA) Better Roads Grant Program Hazard Mitigation Grant Program (HMGP)	*The Committee is interested in receiving more information to learn about the ERAF benefit and is generally committed to helping their neighbors and community in receiving the most disaster relief possible. NVDA will generate information to help the Committee and Town make the best decision for them.*
Continue to meet Vtrans Road and Bridge standards.	Road Foreman	Near-term (ongoing)	$	Better Roads Grant Program	NVDA training and technical assistance and programs include Road Foreman Trainings, Transportation Advisory Committee
Continue updating of the Town's transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool.	Road Foreman	Near-term (ongoing)	$$$	Town Budget Better Roads Grant Program	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)	$$	Flood Resilient Communities Fund (FRCF) Flood Mitigation Assistance (FMA) Better Roads Grant Program	Grants include FEMA, Better Back Roads, Grants-in-Aid *This is already met and achieved in the town, and well within its capacity to continue doing so. NVDA can assist in generating greater reporting up updating of culverts to State/VTrans/appropriate party so that they can accurately display*
Participate in regional road foreman trainings and Transportation Advisory Committee meetings to stay abreast of flood resilience measures for the Town's roads and bridges.	Road Foreman	Continual	$	Flood Resilient Communities Fund (FRCF) Flood Mitigation Assistance (FMA)	Agency of Transportation; https://localroads.vermont.gov/content/upcoming-webinarsworkshops
Ice/Wind/Snow					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Clear and maintain town road ROWs to protect town infrastructure.	Selectboard/ Road Foreman	Continual (ongoing)	$	Hazard Mitigation Grant Program (HMGP) Building Resilient Infrastructure and Committees (BRIC)	NVDA Road Foreman trainings *This is already achieved and is within the town's capacity.*
Encourage utility companies to clear and maintain utility corridors.	Selectboard/ Road Foreman	Near-term (0-24 months)	$	Town Clerk	VTrans has outreach materials *NVDA can look into building connection with Vermont Electric Co-op to ensure this is met to avoid power outages*

Develop a periodic program to survey and clear tree limbs and maintain town road ROWs.	Road Foreman, Emergency Management Coordinator	Near-term (ongoing)	$$	Pre-Disaster Mitigation Grant (PDM) Hazard Mitigation Grant Program (HMGP)	Maidstone 4 Life, Front Porch Forum, town website *The Committee would like to pursue and establish a program*
Explore a backup power source for the Primary Local Emergency Shelter (Maidstone Town Hall) to deal with power outages.	Selectboard	Near-term (0-12 months)	$$	Hazard Mitigation Grant Program (HMGP) Building Resilient Infrastructure and Committees (BRIC) Pre-Disaster Mitigation Grant (PDM)	*The Town and Committee is already in the process of acquiring a generator for the Town Hall*
Educate the public on keeping heating exhaust vents clear in the case of extreme snowfall.	Selectboard, Emergency Management Coordinator	Near-term (0-24 months)	$$	Building Resilient Infrastructure and Committees (BRIC) Town Budget	Maidstone 4 Life, Front Porch Forum, town website *This was identified as a viable strategy yet would have to be fleshed out to become realistic, effective, and efficient.*
Establish a network of volunteers to dig out residents who need help.	Selectboard, Emergency Management Coordinator	Near-term (0-24 months)	$	Building Resilient Infrastructure and Committees (BRIC) Pre-Disaster Mitigation Grant (PDM)	Maidstone 4 Life, Front Porch Forum, town website *This also was identified as a possible strategy yet would have to be developed as to be localized for assistance and not stretch volunteer capacity unnecessarily thin.*

Drought					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Produce general awareness and knowledge about appropriate water usage and efficiencies in seasons and periods of moderate drought.	Planning Commission	Near-term (ongoing)	$$	Town Budget Vermont Drought Resources	*The committee proposed the idea of preparing residents for possible future drought conditions in relation to the region's dependence on surface and spring water.*
Survey lake owners to get an understanding of how many people receive their water from the lake.	Selectboard	Mid-term (next 24 months)	$$	Town Budget Vermont Drought Resources	*The committee proposed this strategy to get an understanding of lake usage and reliance. This could be done in tandem with the Septic Social.*
Cold					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Make information available about low- and no-cost weatherization opportunities, as well as lending programs.	Emergency Management Coordinator, Selectboard	Near-term (ongoing)	$	Vermont Clean Energy Development Fund	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	Long-term (36-60 months)	$$$	Building Resilient Infrastructure and Committees (BRIC)	Energy Committee, Vermont Energy Dashboard
Invasives					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Promote the benefits of the Maidstone Lake Reclassification	Conservation Commission/ Road Foreman	Long-term (24-60 months)	$$	Town Budget	NVDA Road Foreman trainings; grants, such as Better Back Roads

among the community to put greater awareness on the nutrient loading issues.					
Develop and promote Lakeshore Septic Social to promote best practices in shoreline waste management and address nutrient loading.	Lake association(s)/ Conservation Commission	Near-term 0-24 months	$	Town Budget	Agency of Natural Resources, NVDA water quality planner *Most of the lake community identifies with the need to keep the lake clean and well-managed, and the committee expressed interest in developing this as a way to develop clear messages and enhance membership to the Maidstone Lake Association.*
Coordinate with Northwoods Stewardship Center for capacity and volunteerism regarding Greeter Program and Shoreline Monitoring Program.	NCS and NRCD	Continual	$	Town Budget	*This is already met and delivered by Northwoods Stewardship Center. More attention will be given to highlighting current efforts by NSC and Essex NRCD.*
Heat					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Work with home health care providers and volunteers to increase awareness of heat illness.	Planning Commision	Mid-term (next 24 months)	$	Pre-Disaster Mitigation Grant (PDM) Town Budget	The Dept. of Health has grants, outreach materials, and a media toolkit. NVDA has a climate health planner.
Consider development of community Energy	Selectboard	Mid-term (next 24 months)	$$	Town Budget Building Resilient Infrastructure and Committees (BRIC)	The Dept. of Health, NVDA climate health planner, NEK Council on Aging

Committee for heat security information					
Make information available about DIY cooling strategies.	Planning Commision	Near-term (next 12 months)	$	Town Clerk/Budget	The Dept. of Health and NVDA can assist with outreach.
Wildfire					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Continue maintenance and promote locations of existing dry hydrants.	Fire Warden	Near-term (ongoing)	$	Fire Safe 802 Program	Grant funds are available, which allow the Fire Dept. to do this every year. *There are currently four operating dry hydrants, mapped and maintained. One is in current repair. There is a plan set for them to be regularly tested. There is interest for a fifth on the opposite side of the lake, yet there are location, access, and water source issues in identifying where.*
Post information about fire danger levels and the need for burn permits. · Display fire weather forecast on town website https://www.weather.gov/btv/firewx	Selectboard/ Town Web Site Content Manager	Near-term (0-12 months)	$	Town Budget	Campaigns can be seasonal and/or deployed around drought. Front Porch Forum and other social media can be useful. *The Committee is interested in posting fire level danger signs on the appropriate community boards, roads, and websites, and some of that*

					information is already available. Broadcasting high danger episodes in late summer and early fall can be implemented.

Infectious Disease Outbreak					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Formalize resilience measures of a Neighbor 2 Neighbor (N2N) network into a post-COVID all-hazard response.	Selectboard, Maidstone Lake Association	Near-Term (0-24 months)	$	Community Recovery and Revitalization Program	Craftsbury N2N
Establish a permanent location for a satellite food pantry. Identify equipment, storage, and capital needs.	Selectboard, Planning Commision	Long-term (0-48 months)	$$	Vermont Community Foundation Grants	

Hail					
Proposed Action	**Local Leadership**	**Timeframe**	**Cost ($-$$$)**	**Potential Funding Sources**	**Resources/Notes**
Explore options for accessible crop insurance for small growers.	Selectboard , Planning Commission	Near-Term (0-24 months)	$	Pre-Disaster Mitigation Grant (PDM) USDA Claim Process	N/A
Maintain and release a reporting database on the town website assessing hail episodes and damage to better inform	Selectboard , Planning Commision	Long-term (0-48 months)	$$	Town Budget Pre-Disaster Mitigation Grant (PDM)	N/A

education of future events.					

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

When determining the proposed mitigation actions for the 2023 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
Consider becoming a member if the National Flood Insurance Program (NFIP) **HIGH**	Will provide insurance protection for residents and businesses.	The 2023 plan has a proposed mitigation action to explore NFIP compliance in conjunction with river corridor protection. The committee is interested in possible regulatory actions that could protect invaluable shoreline.
Need one or two dry hydrants.	N/A	The Town of Maidstone now has five dry hydrants, with a proposed mitigation strategy Continue maintenance and promote locations of existing dry hydrants.
GIS mapping of NFIP areas	Identify flood areas with vulnerable structures consistent with Vermont GIS mapping effort.	The 2023 plan has a proposed mitigation action to support flood mapping updates and review new flood map information as it becomes available.
Need a new seasonal fire department and truck for summer lake residents. Also need a building with one or two bays.	Need better protection from fire at the remote lake where the population is concentrated	N/A

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

Maidstone does possess a robust set of zoning bylaws for the scale of its town, which can be here. Development is generally allowed only along shorelines and roadways, however there are no requirements against development in forestlands or floodplains. Extraction of earth's resources requires erosion control. Additionally, there is a shoreland overlay to protect vegetation and shoreline encroachment.

There are, however, no land use restrictions or building code requirements.

Resource	Description	How it can help implement Hazard Mitigation Goals	Status
Maidstone 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.
Maidstone Planning Commission	Drafts amendments to the town plan and potential flood hazard regulations.	Can make informed decisions on participation in the National Flood Insurance Program.	Outreach to the public to create awareness of regulations and their role in hazard mitigation may

			improve effectiveness of the regulations. Training and outreach from the Agency of Natural Resources and the regional planning commission would be helpful. The planning commission has the capacity to propose ordinances building within floodplains, develop fire safety protocols, and apply for grants and funding.
Local Emergency Management Plan (LEMP)	Basic municipal procedures for emergency response. This gets updated annually.	The LEMP outlines procedures for call-outs, evacuations, etc.	VEM updated the LEMP process in 2019 to allow more flexibility and incorporate more planning resources. The LEMP could be expanded into the long form to address elements of this plan.
Maidstone Lake Association	The major goal of the Maidstone Lake Association is to encourage responsible stewardship of Maidstone Lake	Continues to help coordination with local resources, greeter program, and more	Representation on the local hazard mitigation team will assist with coordination of hazard mitigation actions. Capacity is volunteer-based and is already maxed out.
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. The road foreman can build the capacity to pursue and maintain this permitting program.
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. The RPC is always available for capacity and coordination.

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 Maidstone Town Plan, Annual Town Reports, Local Emergency Management Plan, and other pertinent documents 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 Maidstone's Town Plan, which expires in 2024, will incorporate recommendations from this updated plan.

Maidstone had an All-Hazards Mitigation Plan completed in 2005, however it was not adopted since the town doesn't participate in the NFIP. 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 and river corridor protection, will be considered; however, this plan cannot guarantee adoption.

Maidstone'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 Maidstone will make the plan available to the general public from its website (https://www.maidstone-vt.org/). The plan will also be available from the regional planning commission's website (nvda.net).

Once approved by FEMA and adopted by the Town, Maidstone'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 action strategies. Interim amendments do not require a formal re-adoption of the plan. Maidstone 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

Moving forward Maidstone 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. The monitoring of these two plans will be done by selectboard and planning commission officials.

Maidstone's selectboard chair is responsible for initiating this annual review process and will take primary responsibility for ensuring the evaluation 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 evaluation 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 in the updating process. 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. Ultimately, it is the responsibility of the LHMP Committee members, the Planning Commission, and the Selectboard for monitoring, evaluating, and updating the plan.

Entities tasked with mitigation actions will be encouraged to participate at the Selectboard meeting. Additional stakeholders may also be invited, including local businesses and nonprofits, 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.

Appendix A: Evaluation of Proposed Mitigation Actions

When evaluating proposed hazard mitigation actions, the Maidstone 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

The following is a composite score from the four members of the committee. These scores were then assessed in a committee meeting with the regional planner to discuss viability and achievability.

All Hazards								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Explore funding sources and opportunities to improve telecommunications	3.25	3.33	2.66	3.66	3.33	3.33	3.66	**3.32**
Update Maidstone State Forest Management Plan	3.25	3.33	2	3	3	3	3.33	**2.99**
Ensure the Primary Local Shelter is stocked with adequate supplies, including cots, blankets, and MREs. Increase amenities and capacities as needed	3.75	3.25	3	3.5	3.5	3.5	3.5	**3.43**
Ensure that the Local Emergency Management Plan is kept up-to-date.*	4	3.75	3	3.5	3.5	3.75	3.75	**3.61**
Ensure the Town web site serves as a reliable sources of information in an emergency, including contacts, evac routes, and EOC's	4	3.5	2.75	3.25	3.5	3.75	3.75	**3.5**
Investigate benefits of Forest Legacy Program through the USFS	3.25	2.5	2.5	2.75	2.75	2.75	2.75	**2.75**
Establish Primary & Alternate Evacuation Routes. Develop extensions of road where connectivity lacks to meet alternate route making	3	3	2.25	2.75	3	2.5	2.75	**2.75**
Consider implementation of lake setback and erosion-prone regulations	3.5	3.25	2.75	2.25	3	2.75	3.25	**2.96**
Complete a Lake Watershed Action plan for Maidstone Lake that addresses shoreland areas, roads, and Maidstone State Park, building off previous Lake Wise assessments, design, and implementation efforts.	3.25	3.5	2.25	2.5	2.75	2.5	3.25	**2.86**

Flooding and Fluvial Erosion								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Provide information on the benefits of the National Flood Insurance program and technical support for towns that are interested in joining the program. provide information on the flood hazard map update process. Anticipate flood mapping updates and review new flood map information as it becomes available.	3	2.75	2.25	2.75	2.75	2.75	3.25	**2.76**
Continue to identify and map Maidstone's natural flood protection assets, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forest areas.*	3	2.75	2.25	3.25	3	3	3.5	**2.96**
Revaluate the flood regulations to ensure continued compliance in joining the National Flood Insurance	3	2.75	2.25	3	2.5	2.75	3.75	**2.86**

Program. Consider regulations that will protect erosion-prone and floodwater storage areas from additional development and encroachment.								
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.	3.75	3.5	3	3	3.25	3	4	**3.36**
Attempt to achieve yearly updating of the Town's transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool.	3.25	3.25	2.5	3	2.75	3.25	3.5	**3.07**
Identify and replace undersized and failing culverts.	4.25	4	3.25	3.75	4	3.25	4.25	**3.89**
Ensure proper training and outreach regarding development in flood hazard areas, including forms of development exempt from local regulation, such as required agricultural practices.	3.5	3	2.5	3	3	3	3.5	**3.07**
Create coordination and accessibility to regional conservation groups concerning Connecticut River, Maidstone Lake, and decreasing stream velocity strategies	3.25	3	2.5	2.75	2.75	3	3.25	**2.93**
Implement River Corridor protection within town plan to qualify for ERAF	4	4	2.66	3	3.33	3.66	3.66	**3.47**
Work with partners in the basin to implement priority floodplain restoration projects	3.25	3	2.75	2.75	3	3	3.25	3
Evaluate priority culverts for AOP restoration potential and impact along with potential stream geomorphic benefits	3.5	3	2.25	2.75	2.75	2.75	3.5	**2.93**

Ice								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Clear and maintain town road ROWs to protect town infrastructure.	4	4	3.25	3.25	3.5	3.25	3.5	**3.54**
Encourage utility companies to clear and maintain utility corridors.	3.75	4	2.75	3.25	3.5	3.75	3.5	**3.5**
Promote awareness of a winter tire access program for low-income residents with used (but still usable!) winter tires.	3	3.25	2.5	2.75	2.75	3.25	3.25	**2.97**
Establish a winter tire access program for low-income residents with used (but still usable!) winter tires.	3.5	3.5	2.25	2.75	2.75	3	3.25	**2.61**
Wind								

Develop a periodic program to survey and clear tree limbs and maintain town road ROWs	4	4	3	3.25	3	3.25	3.5	**3.43**
Implement a road recovery response team after wind events to check and manage ROW's	4	3.75	2.25	3	3	3	3	**3.14**
Explore a backup power source for the Primary Local Emergency Shelter (Maidstone Town Hall) to deal with power outages	4.25	3.75	2.75	3.75	3.75	3.25	3.5	**3.57**
Upgrade lines and poles to improve wind loading and underground critical power lines.	4	4	2.25	3.25	3.5	2.75	3.25	**3.29**
Enhance strategies for debris management for severe windstorm events.	4.25	3.25	2.25	3.5	3	3	3.25	**3.21**
Snow								
Educate the public on keeping heating exhaust vents clear in the case of extreme snowfall.	4	3.75	2.5	3	3	3.25	3.75	**3.32**
Establish a network of volunteers to dig out residents who need help.	3.75	3.5	2.25	3	3	3.5	3.5	**3.21**
Explore assistance opportunities for owners of large structures prone to collapse from snow load.	4	3.5	2.25	3	3	3	3.75	**3.21**
Drought								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Explore and generate committee to develop Groundwater Mapping project to better inform the residents who use well or spring water supplies about the quality and condition of the water sources.	3.75	3.25	2	2.25	2.5	2.5	3.25	**2.79**
Encourage people to crowd source information in the Agency of Natural Resources Drinking Water Drought Reporter by linking to it from Town web site.	3	2.75	2.25	2.25	2.75	2.75	3	**2.68**
Cold								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Support efforts to distribute firewood to residents in need.	3.5	3.25	2.25	3.25	3	3	3.25	**3.07**
Establish a network of volunteers to dig out residents who need help.	3.5	3.5	2.25	3.25	3	3	3.25	**3.11**
Explore assistance opportunities for owners of large structures prone to collapse from snow load.	3.5	3.5	2.25	3.25	3	3.25	3.5	**3.18**
Make information available about low- and no-cost weatherization programs such as HEAT Squad and Northeast	4	4	2.5	3.25	3	3.75	4.25	**3.54**

Employment Training Organization (NETO).								
Make information available about lending programs that can improve the efficiency of older housing stock, such as Efficiency Vermont's "Heat Saver" loan, USDA Direct and Guaranteed Loan Programs, for single homes and multi-family homes. *	4.25	4	2.5	3	3	3.5	4	**3.46**
Complete energy audits on Town and community structures and weatherize them. Publicize results.*	4.25	4	2.75	3.25	3.5	3.75	4	**3.64**

Invasives								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Formalize road crew best practices for seasonal mowing. (Mechanical control methods reduce the spread of invasives along roadways.	3.75	3.25	2.75	3	3.5	3.25	3.25	**3.25**
Support education and outreach efforts regarding best practices for lake and pond users.	4.33	4	2.66	3	3	3.33	4	**3.47**
Conduct a survey of trees in public ROWs that may be impacted by Emerald Ash Borer.	3.25	2.75	2.5	2.5	2.75	2.75	3.25	**2.82**
Investigate implementation of boat/wakeboat permitting program on Maidstone Lake	3.25	3.25	2.5	2.5	3	2.75	3	**2.89**
Coordinate with Northwoods Stewardship Center for capacity and volunteerism regarding Greeter Program and Shoreline Monitoring Program	4	3.75	2.5	3.25	3.25	3.5	3.75	**3.43**
Educate lakeshore owners about Lake Wise program	4	3.75	2.75	3	3.25	3.25	4	**3.43**
Develop and promote and Lakeshore Septic Social to promote best practices in shoreline waste management and address nutrient loading	3.75	3.5	2.75	3	3.25	3.75	3.75	**3.46**
Consider Promotion of Mapping for Healthy Forests Program within community	3.75	3.5	2.25	2.75	3	3.25	3.25	**3.11**
Promote and pursue Maidstone Lake Reclassification	3.75	3.5	2.75	3.25	3.25	3.5	3.75	**3.39**
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.	3.75	3.5	2.25	3	3	3.25	3.25	**3.14**
Assess the capacity for hosting a local cooling shelter.	3.5	3.5	2.25	2.75	3	2.75	3.25	**3**

Make information available about DIY cooling strategies.	3.5	3.25	2.5	3	3	3	3.25	**3.07**
Encourage building retrofits to improve ventilation and cooling by raising awareness of Northeast Employment Training Organization and HEAT Squad. While these organizations are usually associated with low or no-cost weatherization, their staff also address ventilation and cooling.	3.75	3.5	2.25	3	3.25	3.25	3.5	**3.21**
Consider development of community Energy Committee for heat security information	3.75	3.5	2.25	2.75	3	3	3.25	**3.07**

Wildfire								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Promote firewise safety evacuation kit	4	3.5	2.5	3	3.25	2.5	3.5	**3.18**
Maintain and promote locations of existing dry hydrants	4.25	3.75	3	3.5	3.5	3.5	3.75	**3.61**
Post information about fire danger levels and the need for burn permits	4	3.75	3.25	3.25	3.75	3	3.5	**3.5**
Town develop firewise safety mgmt and build capacity for suppression	4	4	2.5	3	3.5	3.25	3.5	**3.39**

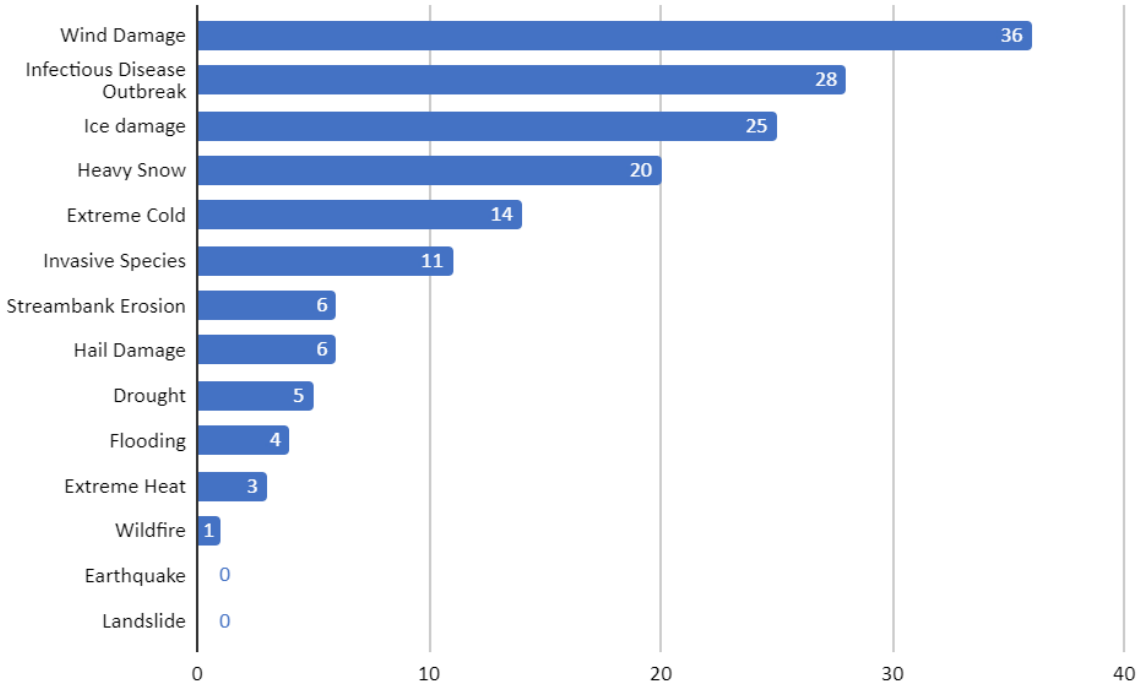
Hail								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Explore options for accessible crop insurance for small growers.	3.75	3.25	2.25	2.75	3	3.5	3.75	**3.18**

Infectious Disease Outbreak								
Mitigation action	**Social**	**Technical**	**Admin**	**Political**	**Legal**	**Economic**	**Environmental**	**Total**
Formalize resilience measures of a Neighbor 2 Neighbor (N2N) network into a post-COVID all-hazard response.	4	3.5	2.25	3.25	3	3	3.25	**3.18**
Establish a permanent location for the satellite food pantry. Identify equipment, storage, and capital needs.	4	3.5	2	2.75	3	2.75	3.25	**3.04**

Appendix B: Maidstone Hazard Mitigation Survey Summary

Maidstone Hazard Mitigation Survey (115 Responses total)

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: 86; Skipped 29)



Comments:

1. Covid
2. 1- we had to do embankment stabilization on our lake front. Maidstone should lower the lake level each fall. 2- culvert froze which resulted in a lot of water overflowing the road run off 3- ice took out our dock two years in a row. 5- winds come across the lake at high speeds and have blown our gas grill off the deck, and resulted in trees down 12- there are 2 or 3 types of plants growing near the lake road... Chinese weed (looks like squash leaves) and Horse Tail. Spreading next to the road and onto individual properties.
3. Drought effects the garden and fruit trees.
4. 1) Rain runoff from the road causing damage to my house. 2) lake ice shifting could cause property damage
5. Spring Water source dried up after 50 years Also many weeds taking over shoreline
6. Consistant break-ins on the North Road always with property damage, and theft- never resolved!
7. For invasives, of course the lake is top of mind. On land, I have an invasive plant with broad leaves that is very challenging to control. Also, the Asian lady beetles are a horrible menace

8. Power outage and sudden surge.

9. COVID

10. No to invasive unless black flies & mosquitos qualify. Infectious disease- Covid
11. Power loss.
12. Deterioration of Water quality in Maidstone Lake due to unchecked clear cutting of lots, significant increases in grass and fertilizers along the shoreline and changes to shorefront rocks and plants.

13. Falling trees during ice storms result in extensive power disruptions. Significant winter storms often are followed by arctic air masses. This is a dangerous combination.

14. I've had ice damage to our dock. My wife and I have had COVID. Our camp has had extreme heat and cold.

15. Road erosion from west side road into driveway.

16. Power loss

17. Due to drought lake levels were lower.

18. Don't restrict things due to some alleged hazards.

19. Recent storm resulted in down wires and trees. Electrical surge to camp resulted in approx $7000 damage to electronics.

20. Before 10 year. Fire

21. COVID 19

22. 90 MPH hurricane wind came across the lake and blew a large pine tree down onto my garage
23. High winds, power outages, ice damage along shoreline
24. ice damage along shoreline of Maidstone Lake. The State will not allow for Lake levee to be lower and therefore it is my belief we will have continued and increased shoreline impacts under certain iceout conditions.

25. Erosion of soil near lakefront Trees down due to heavy snow, wind -- one tree causing damaged roof

26. Ice damage to boat house. Trees snapped off and damaged neighbor's roof. Some damage to ours also. (power lines)

27. There's nothing you can do about the weather!

28. Power loss will make my camp freeze so there would be damage from frozen pipes. Also not getting propane delivery due to heavy snow.

29. Power loss

30. Power loss

31. power loss; frozen septic; uneasiness going out in public during outbreaks
32. Power loss
33. Caused by ice out on the lake, due to excess water in the Lake

34. Power loss

35. It is my opinion that the nutrients came down the stream that enters Maidstone Lake by our camp from the logging operation that was going on at the time. One could see the clearcut area from the Lake. The weed, Pondweek, is native to VT but grows when nourished. We had people come from the State and they informed us about Pondweek.

36. Glossy Buckthorn taking over wooded areas

37. Our house is on 1993 Westside Lake Road, heavy snow inhibits travel on our driveway, both in and out, due to snow and ice.

38. Power loss/time lost from work to clear fallen trees due to wind. Dock damage to ice.
39. Phone lines down after tree blew down. Not sure how to control the ice damage and snow!
40. Line from pole to house was damaged

41. Ice damage occured several years ago to our dock on the lake and wind damage causes power outaged occasionally.

42. Wind damage brought down large trees, causing damage to buildings. COVID-19 cost time from work, productivity in self-owned company. Increased cost for testing supplies, PPP, sick time paid. Hail damaged fruit-bearing plants for season.

43. Covid. Japanese Knotweed taking over in various local places. Not on our property yet, but it is in Town and very concerning.

44. Property taxes are too high for a camp on an island that gets little use.

45. None of these have affected us in the last 10 years.

46. Damage to dock and stairs

3. Do you have any suggestions on how to lessen the adverse impacts of these hazards/events?(Open-ended comments; Answered 36; Skipped 79)

1. Information on how to better protect your home and property specific to the top concerns of our citizens. Maybe expert presentations and information posted on the clerks website.

2. - Lower the Lake each fall - Better monitoring of the soils the town adds to the lake road. Spraying to control current infestations. - more tree trimming near the roads and power lines

3. No

4. 1) Improve water management on the road. Direct water flow away from flowing down driveways 2) strategically placed underwater pumps to reduce the risk of destructive ice movement.

5. Allow more homeowner control of shoreline. 30 years ago Keene Scott and my grandfather would drop a dump truck of sand in front of the camps it didn't have a negative effect on anything

6. Most are either global environmental. Others are at the whim of nature like ice damage to lake structures The most important area for local mitigation is making sure roads are cleared after wind damage and massive snow accumulation. I am confident our local resources will continue to provide essential mitigation as the have in the past

7. Better control of streams - meaning making streams more free flowing, ie removing infill, soil, trees, debris.

8. The trees on our road should be trimmed or removed because they are too close to the power lines. Power outages have the most impact on our property since we can't keep the house warm without power.

9. Not exactly.

10. Ensure that new landowners are required to follow the rules of the Vermont Agency of Natural Resources | Department of Environmental Conservation, Watershed Management Division, Lakes & Ponds Program. It is a great program but only personnel who volunteer to follow the guidelines/requirements are abiding. Many violations are occuring on the lake with no recourse.

11. Government can only do so much. Organized neighborhood emergency teams properly trained and equipped can provide assistance to the stranded especially seniors and those with medical and mobility issues.

12. Maintain riparian areas for flood mitigation.

13. Get immunized and wear a mask when applicable.

14. No.

15. No

16. Upgrade electrical service and WIFI

17. Keeping boats that have milfoil or other invasive weeds on them from being allowed to enter into the lake

18. Suggest that the town have a transportable trailer with emergency equipment that could rapidly be deployed to areas that needed it. In addition, suggest a volunteer organization be established and trained to handle appropriate problems.

19. No, act of God.

20. No

21. The state has been engaged by the MLA and they will not entertain this idea that something can be done -- they will not allow our lake to change from our "natural" leveee -- even though the levee was set unnaturally by a dam. That tells you all you need to know the state.

22. Would like to see water level lowered in winter. Have spent considerable money having large trees that pose a hazard taken down in recent years.

23. Trim trees along roadsides so they won't fall on powerlines if they break.
24. Underground electrical cables
25. education for the public on ways to lessen effects; ie. handwashing, personal space
26. Provide an updated and enhanced E.O.C for providing Town residents a place of refuge and emergency communications

27. Lower the Lake level in the fall.

28. Loggers need to be aware of it streams in area and try to keep rain runoff from entering. Weeds were bad for several years. Now there are still a few that appear.

29. Spray herbicide to kill it

30. Bury power lines

31. Buried lines

32. No

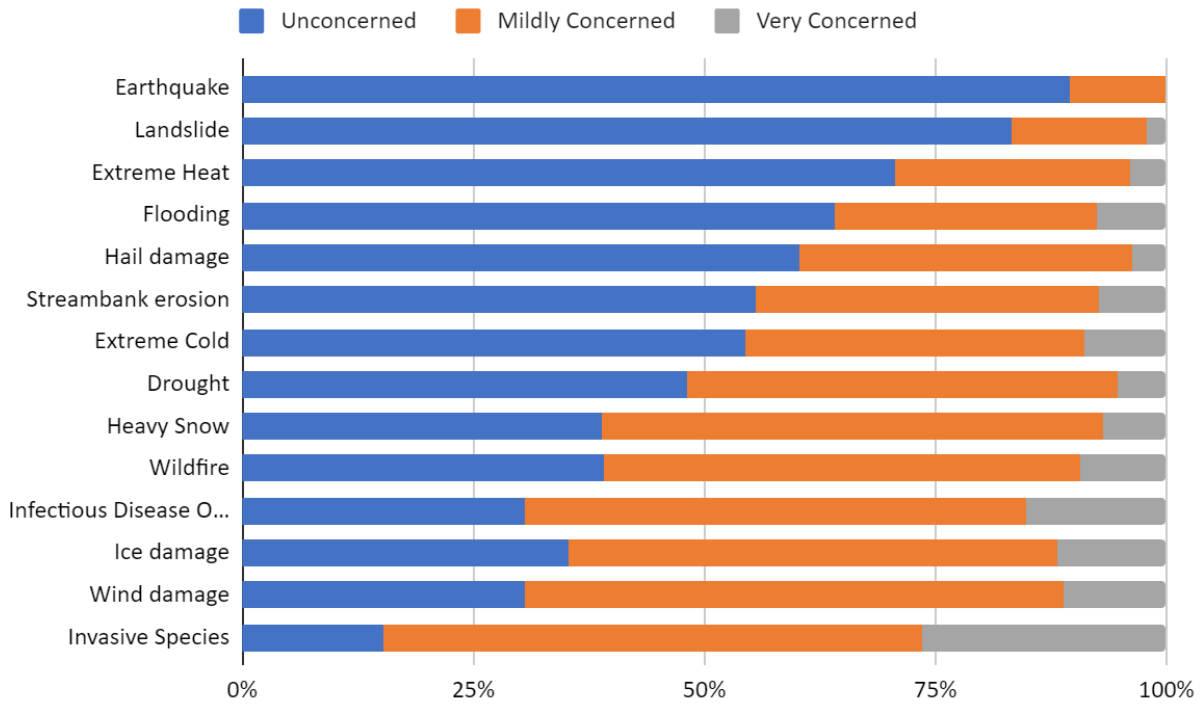
33. Mitigate global warming in whatever way possible to minimize severe weather. No idea how to lessen impacts of infectious diseases.

34. Work with the Extension Service to combat it before it goes too far. NH has a system to eliminate it so there's hope.

35. Provide us with phone numbers for emergency services.

36. We put in a new dock and stairs that could be lifted up. Not sure what other options there are.

4. Are you concerned about these hazards affecting you in the future? (Answered 25, Skipped 90)



Comments:

1. Possibly this is in place but a communication system for the elderly or folks who live alone before, during and after events. (I used to be a "hurricane buddy" for school districts in Florida. The buddy called to check on preparation before, safety during and needs after.)
2. Staying aware.
3. Establish a proactive plan to address growing concerns and risks.
4. Make sure that roads are plowed and sanded to make sure that they are easily navigated. Also pay attention to black ice on the main roads.
5. Need to be able to proactively cut extremely large trees next to our house regardless of distance of tree from lake, to prevent damage to property during high winds/ ice storms.
6. invasive species- continue monitoring program. Infectious disease- continue improving services for prevention & treatment.
7. Warming/Cooling centers could be set up, as could solar panels for our community. Our Maidstoners FB page is awesome as an info site for the community!
8. Work to limit clear-cutting of forests that contributes to promoting droughts (I realize that this is probably outside the scope of the LHMP)
9. No, hurricanes are a natural event.
10. Have no concerns at this time.
11. We are grateful for the program that monitors boats launching in our lake
12. Plow/sand roads. Trim or cut trees along power lines.
13. communication system to alert residents, forest management, remove down and dead trees, public education
14. Generator at Town Hall

15. The above issues refer to Maidstone Lake but not my piece of property there.

16. There is a program to check for invasive plants. The Maidstone Lake association runs the program at the boat landing and individuals check the shore line. So far the Lake is free of milfoil.

17. Emerald Ash Borer and other insects

18. I think we are all victims of the Westside environment. Home on the Lake Shore and roadway is significantly elevated.

19. Plan a secondary emergency evacuation route.

20. Monitoring

21. Emergency routes clarified, modified in the event of wildfire. Better notification of severe weather conditions.

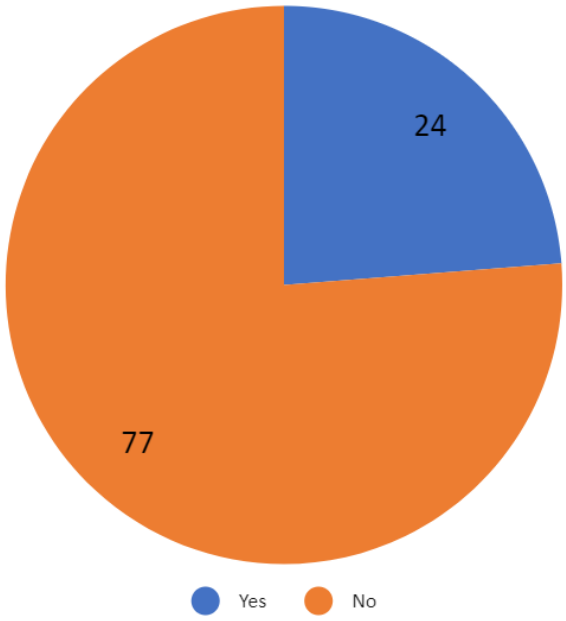
22. Hard to prepare for wind damage, wildfire, or hail damage. With # of trees in Maidstone, we are always at risk for these events. As for invasive species, keep up monitoring for milfoil, etc. Keeping it out of the lake is our only defense.

23. Any effort to help the town and townspeople move toward renewable energy sources would be good!

24. Natural bio-hazards getting into the lake due to farming, planting grassy areas and run offs from the roads, streams and culverts.

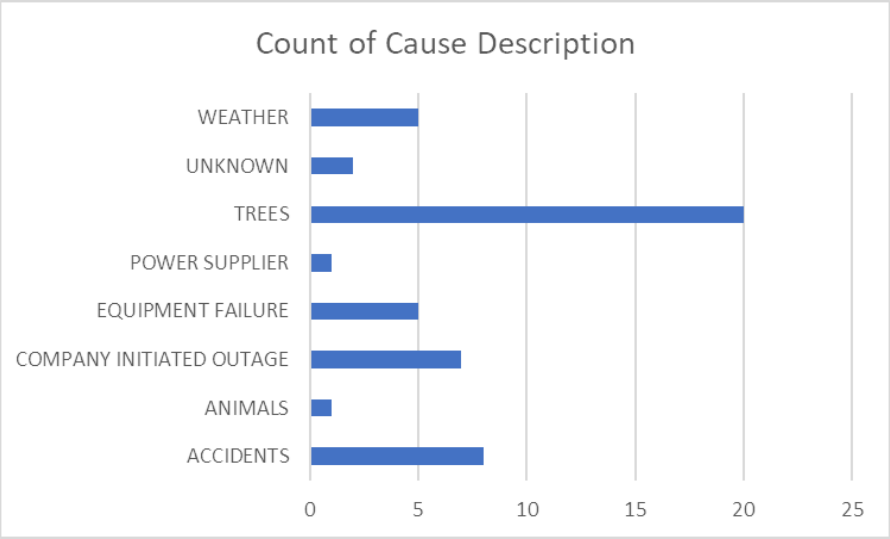
25. Would like to know where our emergency shelter is.

6. Do you know the location of your nearest emergency shelter or services? (Answered 101, Skipped 14)



Appendix C: VT Outage Data

Year	Sum of # Of Cons Out
2008	107
2009	1576
2010	142
2011	850
2012	290
2013	1162
2015	736
2016	27
2017	1030
2018	931
2019	1116
2020	876
2021	155
2022	2772
2023	192
Grand Total	11962



Appendix D: Conservation Group Summary Chart

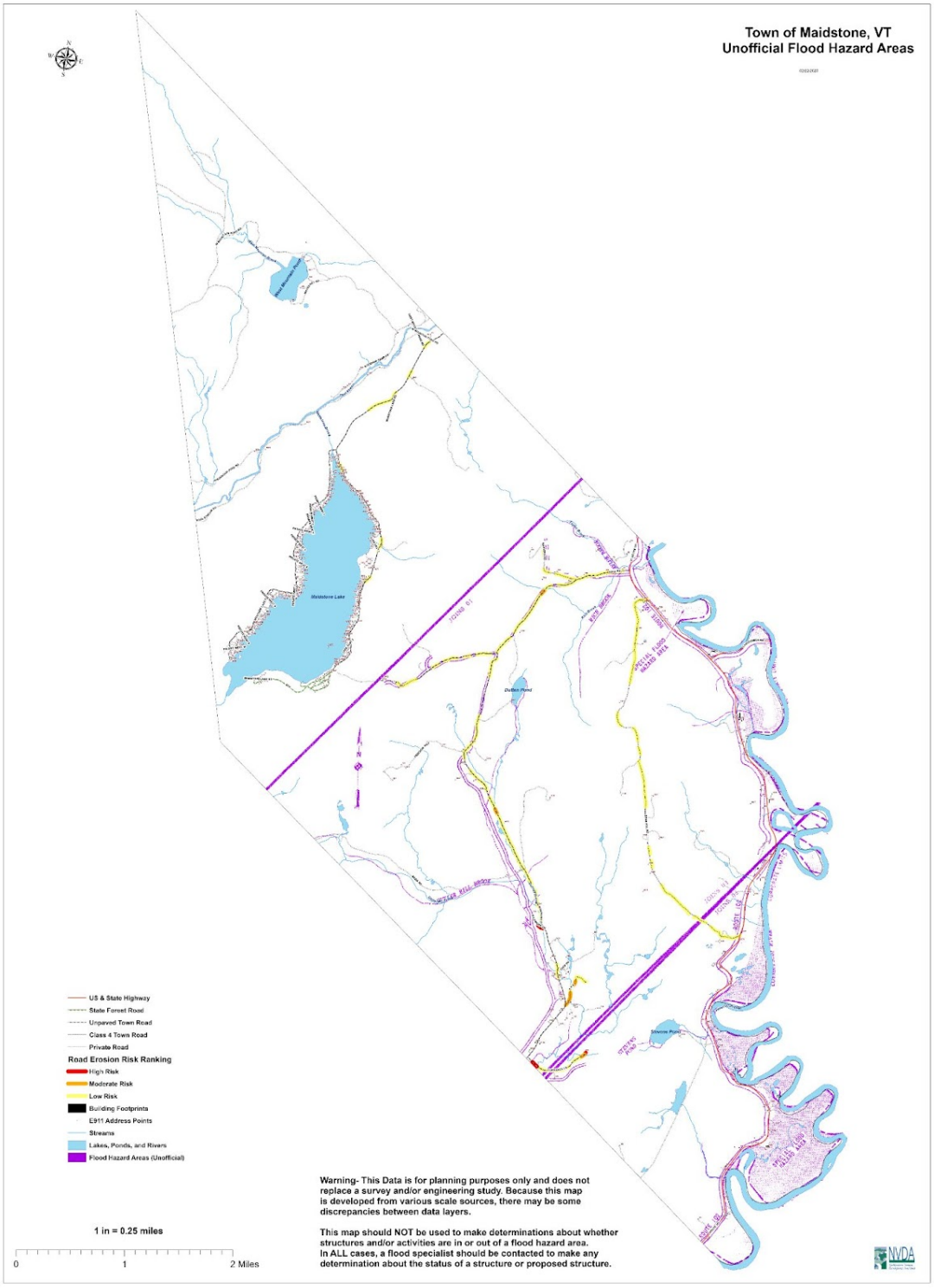
Group/Association	Initiative/Program	What do they do/ How can they help?	Weblink
Government Programs			
USDA & State of Vermont	Conservation Reserve Enhancement Program	Voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water.	Conservation Reserve Enhancement Program
Vermont Fish & Wildlife	Manages West Mountain WMA, Maidstone Lake State Park	WMA that spans north of Maidstone Lake and into Brunswick and Ferdinand. Biodiverse habitat. VF&W mainstains fishing access to Maidstone Lake. Owns Dam. Source of State funding, oversight, and coordination	Maidstone State Park
State of Vermont	Current Use Program	Property tax assessment enrollment program where private landowners can have their land appraised at its current use (farming or forestry) value as opposed to fair market value.	Current Use Program
Vermont Department of Forests	Forestry Actions Plans	Legal framework for forest conservation and sustainability. Resource and education capacity.	Forest Action Plans
Agency of Natural Resources	Lake Watershed Action Plans	Assessment and planning tool that is used to identify the greatest threats to a specific lake ecosystem. Technical guidance. Targeted needs and possible sources of funding. Adaptive capacity. Process can be considered for funding under CWIP	Lake Watershed Plans
	Forest Legacy Program	Federal Grant Program to protect forestlands. Source of funding. Fee simple, easements, or TDR	Forest Legacy Program

	Basin 16 Tactical Basin Program- Upper Connecticut River Direct Drainages	Coordinate strategies to protect watershed, fisheries, and floodplains. Nitrogen loading. Water Quality. Resource guidance. Data gathering.	Basin 16
Vermont Natural Resources Council (VNRC)	Forest Protection, Clean Water, Climate Action, etc.	Can assist in resource capacity, guidance, private property advocacy. Can assist in capacity for Current Use, Transfer of Development Rights (TDR), etc.	VNRC
Statewide Associations			
Vermont Land Trust	Environmental Conservation	Woodlands protection, climate change mitigation. Invasive species reduction. Land restoration, adaptive capacity, land management assistance/guidance	Vermont Land Trust
Vermont Woodlands Association	Tree Farm Program	The goals of the Tree Farm Program are disseminating information about the benefits of proper forest management and establishing good forest management practices on as many acres as possible	VT Tree Farm Program
	Legacy Planning	Capacity building, educational outreach for Current Use, coordinated multi-lot management	VT Woodlands Association
Northeast Wilderness Trust	Wild Carbon Program	Wild Carbon offset credits are generated only on recently protected wildlands that are permanently conserved with a legally binding Forever-Wild Conservation Easement.	Wild Carbon
			NE Wilderness Trust
Regional Groups			
The Nature Conservancy	Family Forest Carbon Program	Program intended to support land and private forest owners to optimize their land for carbon sequestration.	Family Forest Carbon

	Maidstone Bends Preserve: Preserved lands in NH and some in Maidstone	91-acre Andritz property/Potter Farm. 46 more acres in Vermont. 164 acres total of floodplain forest protected. Over 72 species or birds. Improves drinking water, provides essential habitat	Maidstone Bends Preserve
Essex County Natural Resource Conservation District	NRCC Clean Water Design, Rural Fire Protection, Roadside Signs of Conservation Practices, etc.	Local non-profit that does state and federal coordination and organization. Funding through NRCC. Land owner resource.	Essex County NRCD
Connecticut River Conservancy	Committed to maintaining and preserving the water quality of the Connecticut River watershed	Tree planting for healthy riverbanks, protection of biodiversity, preparing for floods, reducing invasive species, etc.	CT River Conservancy
Northwoods Stewardship Center	Forest Stewardship, Education, trail maintenance	Non-profit grassroots organization that does youth employment and education. Assistance in trail building, lake restoration	Northwoods Stewardship Center
Grassroots Organizations			
Trout Unlimited Vermont - Connecticut River Valley Council	Dedicated to coldwater fisheries and watersheds throughout Vermont	Coordination of resources. Active involvement . Stream assessment, tree plantings, regulatory review	Trout Unlimited-CT River
Vermont Family Forests	Forest Ecosystem Conservation	Assistance in forest management, ecological research, education and adaptive capacity. Consultation	VT Family Forests
Vermont Center for Ecostudies	Bird monitoring, Threatened and Endangered Species Protection	Science center for conservation. Resource and adaptive capacity. Data gathering.	VT Center for Ecostudies

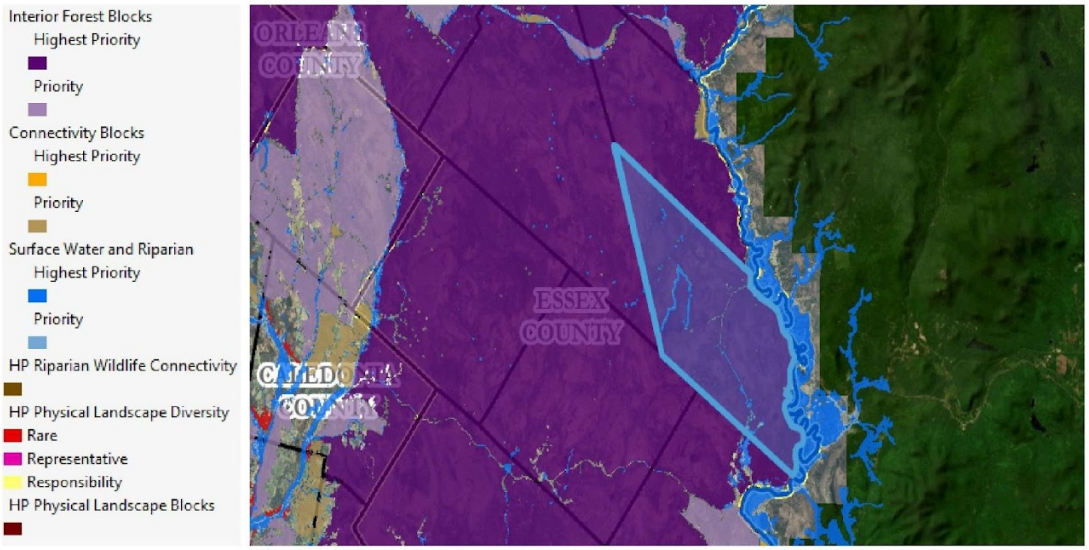
Native Fish Coalition	Protect, preserve, and restore wild native fish populations through stewardship of the fish and their habitats	Can assist in restoring populations of brook and lake trout, salmon, cusk, whitefish, pike, pickerel, in Maidstone Lake and other surface lakes. Resource assistance, adaptive capacity. Education. Advocacy	Native Fish Coalition
Case Studies			
The Nature Conservancy	Gray Mist Farm, NH	Case Study for any farms along the west side of the Connecticut River seeking conservation outcomes, support, and restoration	Gray Mist Farm
Vermont Land Trust	Johnson Farm WMA - conserved operating farm	Excellent case study for agriculture land management along the Connecticut River	Johnson Farm WMA

APPENDIX E: MAPS



VERMONT

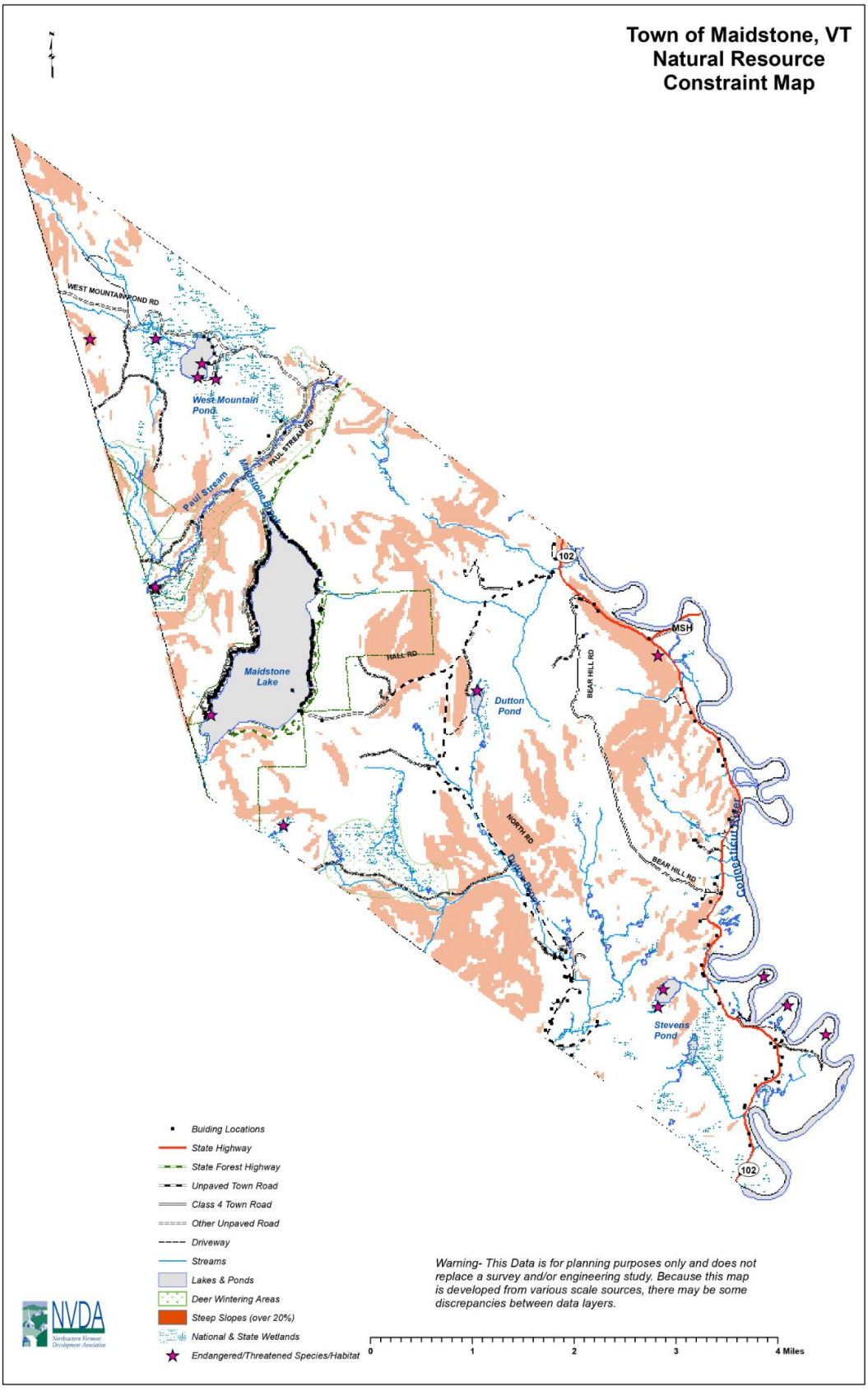
BioFinder
Landscape Scale Report



PRIORITY	ACRES	COMPONENT
Highest Priority	18488.13	Highest Priority Interior Forest Blocks
Highest Priority	18488.13	Highest Priority Connectivity Blocks
Priority	0.87	Priority Connectivity Blocks
Highest Priority	4804.14	Highest Priority Surface Water and Riparian Areas
Priority	3.6	Priority Surface Water and Riparian Areas
Highest Priority	4694.66	Riparian Wildlife Connectivity
Highest Priority	18959.55	Physical Landscape Diversity

Vermont Agency of Natural Resources
2/10/2023 2:36:55 PM

Shows the acreages of overlapping landscape scale components that are part of Vermont Conservation Design


Town of Maidstone, VT
Natural Resource
Constraint Map
WEST MOUNTAIN POND RD
West Mountain Pond
PAUL STREAM RD
Paul Stream
Maidstone Brook
Maidstone Lake
HALL RD
Dutton Pond
102
MSH
BEAR HILL RD
NORTH RD
Outlet Brook
Connecticut River
Stevens Pond
Buiding Locations
State Highway
State Forest Highway
Unpaved Town Road
Class 4 Town Road
Other Unpaved Road
Driveway
Streams
Lakes & Ponds
Deer Wintering Areas
Steep Slopes (over 20%)
National & State Wetlands
Endangered/Threatened Species/Habitat
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.
0
1
2
3
4 Miles
NVDA
Northeastern Vermont Development Association

Appendix F: 5-Year American Community Survey Data (2017-2021)

Housing

SE:A10024. Housing Units by Household Size		
Occupied Housing Units:	108	
1-Person Household	21	19.40%
2-Person Household	77	71.30%
3-Person Household	0	0%
4-Person Household	9	8.30%
5-Person Household	1	0.90%

SE:A10044. Occupancy Status		
Housing Units:	334	
Occupied	108	32.30%
Vacant	226	67.70%

SE:A10055. Occupied Housing Units by Year Structure Built		
Occupied Housing Units:	108	
Built 2020 or Later	0	0%
Built 2010 to 2019	5	4.60%
Built 2000 to 2009	27	25.00%
Built 1990 to 1999	12	11.10%
Built 1980 to 1989	16	14.80%
Built 1970 to 1979	4	3.70%
Built 1960 to 1969	7	6.50%
Built 1950 to 1959	7	6.50%
Built 1940 to 1949	5	4.60%
Built 1939 or Earlier	25	23.20%

SE:A10035. House Value for All Owner-Occupied Housing Units		
Owner-Occupied Housing Units:	107	
Less than $20,000	0	0%
$20,000 to $49,999	1	0.90%
$50,000 to $99,999	7	6.50%
$100,000 to $149,999	7	6.50%
$150,000 to $299,999	27	25.20%
$300,000 to $499,999	49	45.80%
$500,000 to $749,999	6	5.60%
$750,000 to $999,999	10	9.40%
$1,000,000 or More	0	0%

SE:A10036. Median House Value for All Owner-Occupied Housing Units	
Median Value	$382,100

Income

SE:A14006. Median Household Income (In 2021 Inflation Adjusted Dollars)	
Median Household Income (In 2021 Inflation Adjusted Dollars)	$65,500

SE:A10015. Households with Retirement Income		
Households:	108	
With Retirement Income	45	41.70%
No Retirement Income	63	58.30%

SE:A10017. Households with Social Security Income		
Households:	108	
With Social Security Income	79	73.20%
No Social Security Income	29	26.90%

SE:A10019. Households with Wage or Salary Income		
Households:	108	
With Wage or Salary Income	30	27.80%
No Wage or Salary Income	78	72.20%

SE:A14001. Household Income (In 2021 Inflation Adjusted Dollars)		
Households:	108	
Less than $10,000	0	0%
$10,000 to $14,999	1	0.90%
$15,000 to $19,999	3	2.80%
$20,000 to $24,999	17	15.70%
$25,000 to $29,999	7	6.50%
$30,000 to $34,999	2	1.90%
$35,000 to $39,999	3	2.80%
$40,000 to $44,999	11	10.20%
$45,000 to $49,999	9	8.30%
$50,000 to $59,999	0	0%
$60,000 to $74,999	10	9.30%
$75,000 to $99,999	18	16.70%
$100,000 to $124,999	12	11.10%
$125,000 to $149,999	5	4.60%
$150,000 to $199,999	0	0%
$200,000 or More	10	9.30%

SE:B10040. Residents Paying More Than 30% or at least 50% of Income on	-	-
Selected Home Ownership Expenses	-	-

Owner-Occupied Housing Units:	107	
Homeowners Who are Paying at Least 30% of Income for	29	27.10%
Ownership Costs		
Homeowners Who are Paying at Least 50% of Income for	19	17.80%
Ownership Costs		

Population

SE:A00002. Population Density (Per Sq. Mile)	
Total Population	212
Population Density (Per Sq. Mile)	6.9
Area (Land)	30.69

SE:A01001. Age		
Under 5 Years	6	2.80%
5 to 9 Years	6	2.80%
10 to 14 Years	2	0.90%
15 to 17 Years	3	1.40%
18 to 24 Years	2	0.90%
25 to 34 Years	0	0%
35 to 44 Years	13	6.10%
45 to 54 Years	23	10.90%
55 to 64 Years	43	20.30%
65 to 74 Years	63	29.70%
75 to 84 Years	49	23.10%
85 Years and Over	2	0.90%

Employment

SE:A17002. Employment Status for Total Population 16 Years and Over		
Population 16 Years and Over:	198	
In Labor Force:	71	35.90%
In Armed Forces	0	0%
Civilian:	71	35.90%
Employed	69	34.90%
Unemployed	2	1.00%
Not in Labor Force	127	64.10%