Town of Isle La Motte, Vermont
HAZARD MITIGATION PLAN
2022

Photo Credit: Lake Champlain Basin Program, 2011

Approved Pending Adoption by FEMA:
Adopted by the Town of Isle La Motte Selectboard: Date: _____, 2022
FEMA Final Approval:

Resolution to Adopt the Isle La Motte Hazard Mitigation Plan

Whereas, natural and man-made disasters may occur at any time, we recognize that by lessening the impacts of these disasters we will save resources, property and lives in the Town of Isle La Motte, Vermont;

And whereas the creation of the Town of Isle La Motte Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, the Town of Isle La Motte is committed to the mitigation goals and measures as presented in this plan;

And whereas, the respective officials identified in the mitigation action plan are hereby directed to pursue implementation of the recommended actions assigned to them;

Therefore, the Town of Isle La Motte Select Board hereby adopts the 2022 Isle La Motte Hazard Mitigation Plan.

AUTHORIZING SIGNATURES

Date: _____

_____
Selectboard Chair

_____
Selectboard

_____
Selectboard

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ACKNOWLEDGEMENTS

Project Coordinator:

Shaun Coleman – Northwest Regional Planning Commission
Taylor Newton – Northwest Regional Planning Commission (former)

Project Participants:

Town of Isle La Motte Selectboard – Rustam Spaulding, Paul Zera and Catherine Graziano
Residents - Steve Stata, Selby Turner
Fire Chief – Bill Johnson
Northwest Regional Planning Commission – Shaun Coleman, Senior Planner

A full summary of those who participated during the process may be found in Attachment C. This plan should be considered a plan in work due to the continually changing environment in which these hazards present themselves. This plan must also be reviewed and adjusted as growth in population, industry, and overall community demographics change.

1. INTRODUCTION

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this plan is to provide an all-hazards local mitigation strategy that makes the Town of Isle La Motte more disaster resistant.

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

Hazard mitigation strategies and measures **alter199** the hazard by eliminating or reducing the frequency of occurrence, **avert** the hazard by redirecting the impact by means of a structure or land treatment, **adapt** to the hazard by modifying structures or standards or **avoid** the hazard by stopping or limiting development and could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying & modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying & 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
- Buyout & relocation of structures in harm's way
- Establish & enforce appropriate building codes
- Public information

2. PURPOSE

The purpose of this Hazard Mitigation Plan is to assist the Town of Isle La Motte in identifying all hazards facing the county and their community and identify strategies to begin reducing risks from identified hazards. Once adopted, the local mitigation plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property.

Adopting and maintaining the Hazard Mitigation Plan will provide the following benefits:

- Make certain funding sources are available to complete the identified mitigation initiatives that would not otherwise be available if the plan was not in place.
- Ease the receipt of post-disaster state and federal funding because the list of mitigation initiatives is already identified, including Vermont Emergency Relief Assistance Funding.
- Support effective pre- and post-disaster decision making efforts.

- Lessen the Town's vulnerability to disasters by identified initiatives ranked by importance.
- Connect hazard mitigation planning to community planning where possible.

3. COMMUNITY PROFILE

The Town of Isle La Motte is located in Grand Isle County (44.8770° N, 73.3387° W.) Isle La Motte is one of the Lake Champlain islands, sharing a border with Alburgh to the north and North Hero to the east. The town of Grand Isle is directly south of Isle La Motte. All of these communities, including the smaller Lake Champlain islands and South Hero, make up Grand Isle County. The total area of Isle La Motte is approximately 7.9 square miles. The population of the community is 494, according to the 2013-2017 American Community Survey.

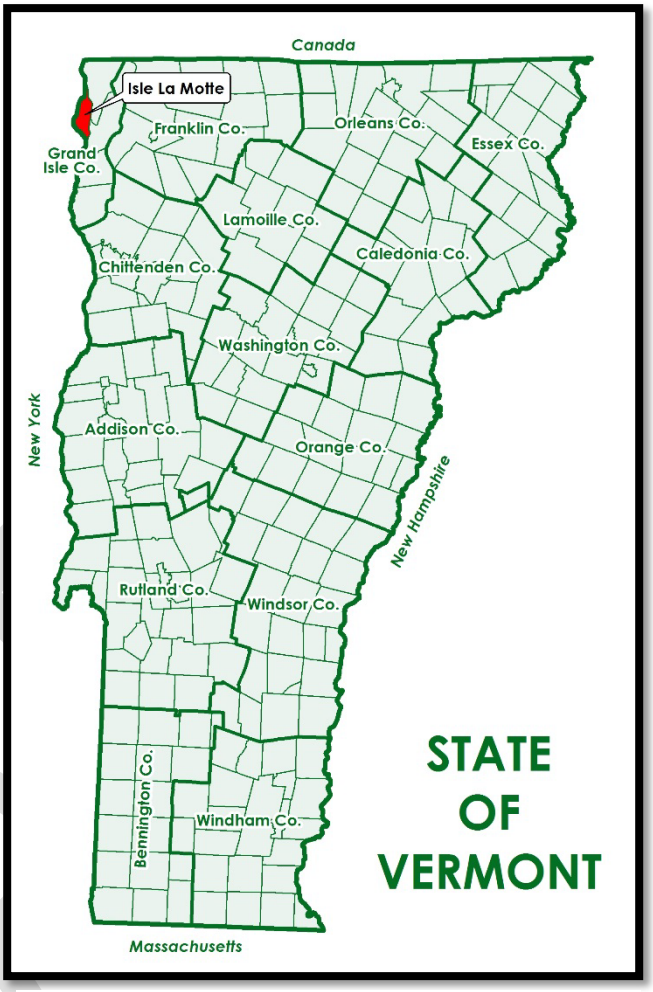


Figure 1 - Location Map

As an island in Lake Champlain, Isle La Motte is a special place. There are many features of the island that are unique and are essential to the Town's character. The scenic character of Isle La Motte could best be described as quiet open farmland surrounded by attractive waterfront areas with spectacular mountain views. The buildings are attractive and consistent with the overall impression of peaceful rural charm, a commodity much in demand by summer visitors. As a result of this demand, the population of Isle La Motte varies greatly with the season. Tourism and second home residences are attracted by the beauty of our lake and the pastoral setting and continue to be important in the growth of Isle La Motte.

For the most part, the Town's rural character and small New England village appeal is still healthy and strong. The community of Isle La Motte contains a significant collection of historic structures, as listed State Historic Register (one on the National and forty-two on the State), ranging from stores, cabins, and barns to farm complexes. In addition, Isle La Motte continues to show vitality not only in its economic growth, but in growth of the quality of Isle La Motte as a community. Community action, which involves the citizens of the town, produced that quality that townspeople wish to preserve as part of the growth process.

Isle La Motte is home to the Chazy Reef, a National Natural Landmark dedicated in 2009. It is also the site of the first European settlement in Vermont, Fort St. Anne.

<u>Existing Land Use</u>

As of 2017, there were a total of about 4900 acres of land in Isle La Motte divided into 887 parcels, averaging 5.5 acres. Only 179 acres of the land in Town is owned by a farm, but other land may be used for agricultural purposes. Much of the land is used for permanent, non-mobile home residences (35% percent of all acreage); an additional 11% of the land is used for seasonal homes. Thus, residences use just over 46% of the land in the Town.

Permanent Residences: Only 22% of the parcels are for full-time residential uses. About 7% of all parcels is for residential uses on lots greater than 6 acres in size. The average lot size of the 135 lots that are less than six acres is 1.76 acres.

Commercial Uses: There are 25 commercial parcels of land in the Town; however, this figure does not include businesses that are not reported on the Grand List, such as home businesses, or farms.

Forested Land: Isle La Motte has scattered areas of forested land, including mature forests, wetland forests, and young forests that are growing up from old farm fields or pastures. The Land Use/Land Cover Map shows forested areas (Figure 3.2). The large tracts of forest land shown on the map include small open non-forested areas and young forests that were once hay fields or pasture. Unlike most of Vermont, the Lake Champlain islands support growth characteristic of Central Woodlands, such as shagbark hickory, basswood, black walnut, and red and white cedar.

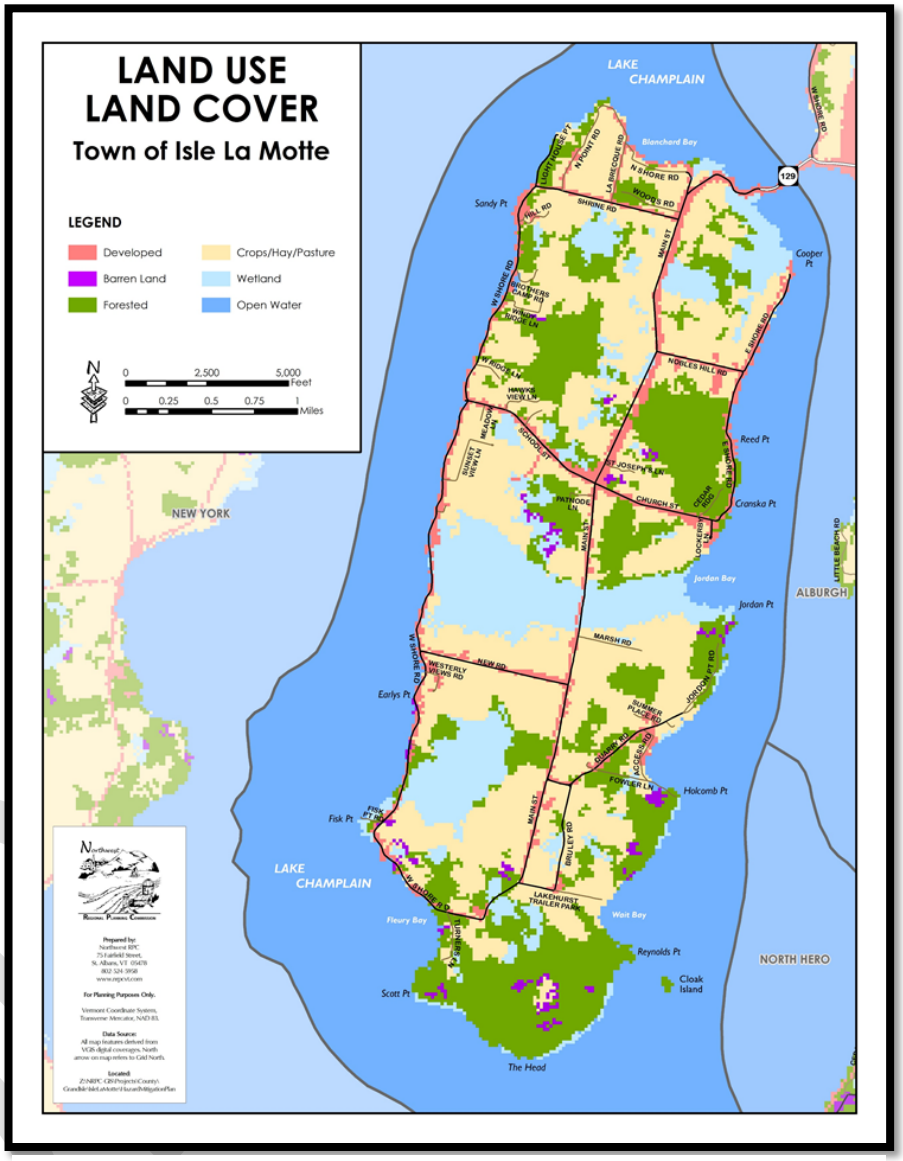


Figure 2 - Land Use/Land Cover

Lake Front: In 2017, about 293 of all parcels of land in Isle La Motte had some lake frontage.

<u>Future Land Use</u>

Isle La Motte does not have a Town Plan and does not have local zoning regulations. Therefore, it is difficult to forecast future land use on Isle La Motte since there are no local policies and limited regulation.

Isle La Motte has adopted an ordinance to ensure that the community can be enrolled in the National Flood Insurance Program and that development in the Special Flood Hazard Area is compliant with Federal minimum requirements.

Since Isle La Motte does not have local zoning, the State's Land Use law, Act 250, applies to any development on lots over 1 acre in size. Given the increased jurisdiction of Act 250 and Isle La Motte's remote location, it is anticipated that the there will be little to no substantive development in the town in the near future.

All conversions of seasonal homes to year-round homes requires a Wastewater and Potable Water Supply Permit from the Vermont Agency of Natural Resources. Since there is no public water or wastewater systems in Isle La Motte, it is not anticipated that there will be future commercial or industrial development in town.

Figure 3 - Topography Map

<u>Population</u>

The US Census American Community Survey estimated that the population of Isle La Motte was 494 in 2017. There were 469 total housing units in 2017, of which 179 are owner-occupied, 25 are renter-occupied, and 265 are vacant or seasonal. Most housing units were counted as single units (89%).

Isle La Motte's population historically has been steady. Between 1950 and 2000 the population increased slowly before dropping slightly in the 2010 Census (Figure 3.4). The population is estimated to remain less than 500 in the 20113-2017 American Community Survey.

The town sees population fluxes because the tourist season in the summer. However, the town is spread out and has less concentrated infrastructure to accommodate the influx of summer travelers. There is a second home population, because of proximity and access to the lake. They have a low full-time population but a relatively high summer seasonal population. This ties up resources and mutual aid is called in if there is an emergency. The Town is considered to have similar resources as towns of their size in the region.

Energy

Vermont Electric Cooperative, Inc. provides the electrical service to the Town and to one of the out islands - Providence Island. Other out islands use generators or do without electricity. Historically, windmills have provided electricity at summer camps and at farms.

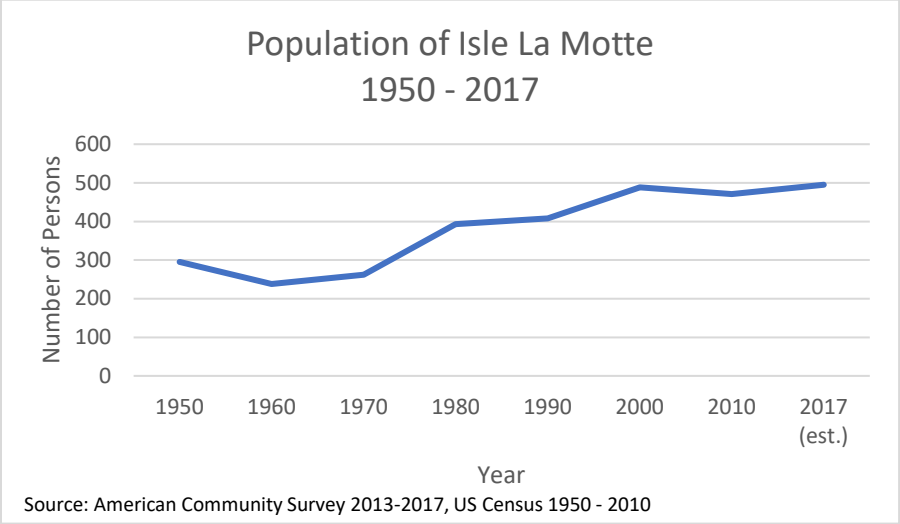


Figure 4 - Population

According to the 2013-2017 American Community Survey, fuel oil and kerosene are the most popular home heating fuels and were used by 84 homes. Wood the second most popular home heating fuel with 61 homes and Bottled, tank or LP gas is the third most popular home heating fuel with 48 units.

Emergency Services

As for health services, the town is served by the Isle La Motte Volunteer Fire Company, the Alburgh Volunteer Fire Department Ambulance Service, the Visiting Nurses Association, and Champlain Islanders Developing Essential Resources, Inc. (C.I.D.E.R.), a non-profit group whose mission is "to develop and foster resources that enable the people of Grand Isle County, Vermont to live in their community with dignity." The Grand Isle County Sheriff's Department and the Vermont State Police provide police services.

Isle La Motte has an Emergency Operations Plan (EOP) to help organize the town in case of an emergency. The EOP contains basic emergency preparedness essentials for responding to local emergencies. It includes critical phone numbers, contact persons, and critical facilities.

Water Supply and Sewage Disposal

There is no public water supply system in Isle La Motte. Each property must establish its own potable water supply in conformance with the State of Vermont Drinking Water and Groundwater Protection Division of the Agency of Natural Resources' rules. Properties in Isle La Motte are served by both well water and from drawing directly from Lake Champlain.

Wastewater is treated by on-site septic systems, which are also regulated by the State of Vermont Drinking Water and Groundwater Protection Division of the Agency of Natural Resources.

Transportation

The only means of transportation for the Town of Isle La Motte is by highway. Isle La Motte has one State Highway 129 that connects the island to Alburgh and US Route 2. U.S. Route 2 is the north-south route connecting the Grand Isle County to island and Town of Grand Isle in the south and to mainland Vermont and New York to the North. The 1990 Functional Classification of this approximately ten mile stretch of Route 2 is minor arterial. For geographical reasons it would be next to impossible to construct any parallel north-south highway to help alleviate the growing traffic congestion on Route 2 and for environmental reasons, highly undesirable. The Town maintains over 18 miles of class 2, 3, and 4 highways throughout the remainder of town (See Transportation Map Pg. 23).

The closest park and ride facility is located in Alburgh near the intersection of US Route 2 and Truck Route. Passengers can meet up with the Alburgh to Georgia Commuter bus in Alburgh Village for access to St. Albans and for connections to Chittenden County. The feasibility of a park and ride in Isle La Motte has been discussed, but is not an option at this time. There is currently no bus service that passes through the Islands. However, C.I.D.E.R (Champlain Islanders Developing Essential Resources) is a local organization that provides transportation services to seniors and people with disabilities in order to help them remain independent.

4. PLANNING PROCESS

Documentation of the Planning Process, Public Involvement and Input from Neighboring Communities

The Town of Isle La Motte held several planning meetings to discuss the development of a Hazard Mitigation Plan. All meetings were open to the public and some were held at regularly scheduled Selectboard meetings. Public in attendance at the meetings were encouraged to participate. All Selectboard meeting agendas were posted at 3 locations in the municipality in compliance with the requirements of Vermont Open Meeting Law. Hard copies of drafts discussed at meetings were available to the public in attendance at meetings and upon request.

The Town of Isle La Motte held their initial planning meeting to approve the Hazard Mitigation Plan project on August 7, 2019. A sample plan was reviewed before the project was approved, and criteria for FEMA funding was also discussed. The meeting was at a regularly scheduled Selectboard meeting. No public comments regarding the plan were received at this meeting. NRPC staff met with a member of the Selectboard and the Town Clerk on October 22, 2019 to review the intent of the plan, review and edit the risk assessment and add mitigation projects to the draft plan.

On December 4, 2019, the draft plan, adoption process, and mitigation actions were reviewed at the regularly scheduled Selectboard meeting on December 4, 2019. Public comment was solicited during the meeting. One comment was made regarding utilizing the elementary school as an emergency shelter. A few edits were suggested. The Selectboard agreed that the draft plan should be updated with the input from the meeting and released for public comment.

A draft of the plan was posted for public comment on the NRPC and Town websites between December 9, 2019 and January 10, 2020. Draft copies of the Plan were also sent to the town clerks of all neighboring communities on December 9, 2019. Comments were requested to be sent to NRPC by January 15, 2020. No comments were received.

The Covid-19 global pandemic caused disruptions across all sectors of society. The Isle La Motte Mitigation Plan was not submitted due to other priorities. On May 2, 2022, at an Isle La Motte Selectboard meeting, they agreed to revisit and update the draft Mitigation Plan. Public comment was taken at the meeting regarding the update and after discussion it was agreed that a generator for the community shelter at the school should be added and recommendations from the recent road erosion inventory be incorporated as mitigation actions.

A final draft of the plan was created and reviewed by the Selectboard, posted for public comment on the NRPC and Town websites between May 27, 2022 and June 15, 2022. Draft copies of the Plan were also sent to the town clerks of Alburgh Town, North Hero and Grand Isle on May 27, 2022. Hard copies were also made available for viewing by the public at the Town Office. The plan will also be presented for comment by the Grand Isle County Regional Emergency Committee at their June 6th meeting. Written and verbal comments were requested to be sent to NRPC Senior Planner Shaun Coleman by June 15, 2022.

Incorporation of Existing Plans, Studies, Reports and Technical Information

Mitigation plans from around the country, current State Mitigation Plans, FEMA planning standards, the FEMA Flood Mitigation Assistance Program requirements and the National Flood Insurance Program's Community Rating System were examined. Other materials examined consisted of community plans, including:

- State of Vermont Hazard Mitigation Plan 2018
- Town of Isle La Motte Flood Insurance Study, 1979
- Town of Isle La Motte Flood Insurance Rate Maps 1980
- Northwest Regional Planning Commission Regional Plan 2018

A complete list of references may be found in Attachment G.

5. RISK ASSESSMENT

Identifying Hazards, Profiling Hazards, Estimating Losses and Assessing Vulnerability

The NRPC staff and the Town of Isle La Motte collected data and compiled research on hazards including: severe winter storm /ice storm, flooding, thunderstorms (high winds, lightning, hail), loss of electrical service, structure fire, hazardous materials, drought, telecommunications systems failure, tornado, earthquake, major fire – wildland, civil disturbance, terrorism/WMD. Research materials came from local, state and federal agencies including FEMA, NOAA, NCDC and DOT. Research was also conducted by referencing historical local newspapers, texts, interviewing residents, and scientific documents. Internet references were widely utilized in historical research applications. Current mitigation activities, resources, programs, and potential action items from research materials and stakeholder interviews were also identified.

The information is based on interviews with local officials and the best available data sources found from federal, state, regional, and local agencies and departments. The risk and/or impact of several hazards were negligible and the state examination was considered sufficient in justifying the time spent on the analysis.

Data from Isle La Motte Planning Commission, Northwest Regional Planning Commission, Local Emergency Planning Committee and Isle La Motte Emergency Services were used to assist in the analysis of areas affected by various hazards. The results of the analysis are listed in Table 1 below. Community mitigation maps are included in Attachments D, E and F.

Hazard identification and risk assessment can be a highly complex, time consuming and very costly effort if sophisticated technical and engineering studies are undertaken. The Town of Isle La Motte does not have the resources to undertake hazard identification and risk assessment studies to this level of detail. The Town of Isle La Motte and the Northwest Regional Planning Commission used a module of Mitigation 20/20 software which included a hazard profile matrix (Table 5.1) that was used to develop a risk rating for each identified hazard. The matrix is intended to be completed by relying on hazard identification and risk evaluation information that is available as well as the knowledge and judgment of planning participants. Health and safety consequences, property damage, environmental damage and economic disruption are classified as consequences of occurrence of each hazard. The following is a description of the risk characteristics used to classify each hazard primarily based on Mitigation 20/20 program:

Frequency of Occurrence:

1. Rare: Unknown but likely to occur in the next 500 years
2. Unlikely: Unknown and unlikely to occur in the next 100 years

3. Possible: Likely to occur in the next 100 years
4. Likely: Likely to occur in the next 25 years
5. Highly Likely: Likely to occur once a year or more

Impact or % Community Impacted:

0. Negligible: < 10% of properties damaged.
1. Limited: 10% to < 25% of properties damages/Loss of essential facilities/services for up to 7 days/few (<1% of population) injuries possible.
2. Critical: 25% to 50% of properties damaged/Loss of essential facilities/services for > 7 days < 14 days/Major (< 10% of population) injuries/few deaths possible.
3. Catastrophic: > 50% of properties damaged/ loss of essential facilities/services for > 14 days/Severe (> 10% of population) injuries/multiple deaths possible.

Health & Safety Impacts:

0. No health and safety impact
1. Few injuries or illnesses
2. Few fatalities but many injuries or illnesses
3. Numerous fatalities

Property Damage:

0. No property damage
1. Few properties destroyed or damaged
2. Few destroyed but many damaged
3. Few damaged but many destroyed
4. Many properties destroyed and damaged

Environmental Damage:

0. Little or no environmental damage
1. Resources damaged with short term recovery practical
2. Resources damaged with long term recovery feasible
3. Resourced destroyed beyond recovery

Economic:

0. No economic disruption
1. Low direct and/or indirect costs
2. High direct and low indirect costs
3. Low direct and high indirect costs
4. High direct and high indirect costs

The risk estimation matrix (See Table 5.1) for the Town derives a "relative risk score" using a qualitative process in which to compile estimates of the likely **frequency** of occurrence, the **impact** to the community, and the likely **consequences** in terms of public safety, property damage, economic impacts and harm to environmental resources. The total is considered in this plan to constitute the relative risk score. The hazards with the highest

risk score are flooding, severe winter storms, and high winds/thunderstorm/lightning. It should be noted that the community's overall risk rating is low (209 out of a possible high of 1,200).

Vulnerability Scores

Vulnerability assessments build on the identification of hazards in the community and the risk that the hazards pose to the community. The vulnerability assessment process examines more specifically how the facilities and systems of the Town would be damaged or disrupted by the identified hazard.

The combination of the impact of the hazard and the frequency was used to determine the community vulnerability (risk score) as HIGH, MODERATE or LOW. The vulnerability classifications based on risk scores are as follows:

- 0-24 LOW
- 25-49 MODERATE
- 50-75 HIGH

For example, a flood event is *highly likely* (nearly 100% probability in the next year) in many communities within Grand Isle County but the degree of impact varies, so a *highly likely* flood with *critical* or *catastrophic* impact rates the community vulnerability as HIGH. A community with a *highly likely* or *likely* (at least one chance in the next 10 years) flood with a *limited* impact would receive a vulnerability rating of MODERATE. The vulnerability of a community having the occurrence of an event as *possible* or *unlikely* with *limited* or *negligible* impact would be LOW.

In order to determine estimated losses due to natural and man-made hazards in Isle La Motte, each hazard area was analyzed; results are shown below. Human losses were not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The median value of a home in Isle La Motte is $202,400 according to the 2013 to 2017 American Community Survey estimates.

A full summary of hazards and impacts is provided in Table 1.

Table 1 Summary of Hazards and Impacts for the Town of Isle La Motte

Hazard Type	Frequency Of Occurrence	Impact/Magnitude	Risk	Estimated Potential Losses (Dollars)	Vulnerability
Severe Winter Storm/Ice Storm	Highly Likely	Limited to Catastrophic	Moderate to High	n/a	Roads, bridges, commercial and residential structures, seasonal homes, public buildings, (Isle La Motte School, Library, cemeteries), school, church, and utilities.
Flooding	Highly Likely	Limited to Catastrophic	Moderate to High	$3,903,360	Loss of road access, power loss, telecommunications loss. Roads, bridges, commercial and residential structures, seasonal homes and utilities.

Severe Thunderstorm (High Winds, Lightning, Hail)	Highly Likely	Limited	Moderate	n/a	Falling limbs and/or trees, power loss, church, school, telecommunications loss, structural damage, crop damage. Commercial and residential structures, seasonal homes, public buildings (Isle La Motte School), utilities.
Loss of Electrical Service	Likely	Limited to Critical	Moderate	n/a	Public building (Isle La Motte School), church, utilities, residential and seasonal homes, commercial structures, including commercial farms.
Structure Fire	Highly Likely	Limited	Low	$287,800	All structure types especially those lacking early detection systems.
Hazardous Materials	Possible	Limited	Low	n/a	Residential and seasonal homes, commercial structures, public buildings including Town Office/Isle La Motte School, Town Garage, Library Buildings, church, school, utilities, and the environment.
Drought	Possible	Limited to Catastrophic	Low	n/a	Commercial structures – farms, livestock, private wells, public structures (water reservoir, water pumping station and wastewater treatment plant), residential and seasonal homes and vulnerable populations.
Loss of Water & Sewer Service	Rare	Limited	Low	n/a	Public health, residential and seasonal homes, commercial structures, church, public structures (e.g., Town Office.)
Telecommunication Systems Failure	Likely	Limited	Low	n/a	Residential structures, seasonal homes, commercial, public buildings (e.g. Town Office) elementary school, utilities. Special needs populations.
Tornado	Possible	Limited	Low	$6,028,382	Falling limbs and/or trees, power loss, telecommunications loss. Structural damage to residential and seasonal homes, public buildings (Town Office, Town Garage) commercial structures and utilities.
Earthquake	Possible	Limited to Catastrophic	Low	$42,198,674	Infrastructure (roads, bridges), structural damage to residences, seasonal homes, commercial building, public buildings (Town Office, Town Garage), utilities.
Major Fire - Wildland	Possible	Limited	Low	n/a	Residential and seasonal homes, commercial structures, utility poles and lines, road closures, fires in rural areas lacking fire breaks.
Terrorism/WMD and Civil Disturbance*	Rare	Limited	Low	n/a	School, public building (Town Office, Town Garage).
Extreme Temperatures*	Possible	Limited	Low	n/a	Fauna, public health.
Hurricane*	Unlikely	Limited	Low	n/a	Local and state transportation networks. Residences, businesses, Town Office, Town Garage, and Elementary School.

Infectious Disease Outbreak*	Possible	Limited	Low	n/a	Fauna, public health.
Invasive Species*	Possible	Limited	Low	n/a	Agricultural crops, forests.
Rock Cuts*	Rare	Limited	Low	n/a	None.
Nuclear Power Plant Failure*	Rare	Limited to Catastrophic	Low	n/a	All flora and fauna. Public health, Agriculture.
Rockslide/Landslide*	Rare	Limited	Low	n/a	None.
*Has never occurred.					

All the hazards identified in the state hazard mitigation plan were considered. The Committee decided it is not feasible to study each in depth again as many of the hazards were considered unlikely or rare. The hazards not profiled in this plan update are considered to be unlikely or rare in the Town of Isle La Motte and therefore will not be profiled in this plan update. Those hazards that are not considered in the local plan may have been profiled in the State Hazard Mitigation Plan. The hazards not addressed in this plan update along with the justification for not including them are outlined in the following table.

Table 2 Justifications for Hazards Not Profiled

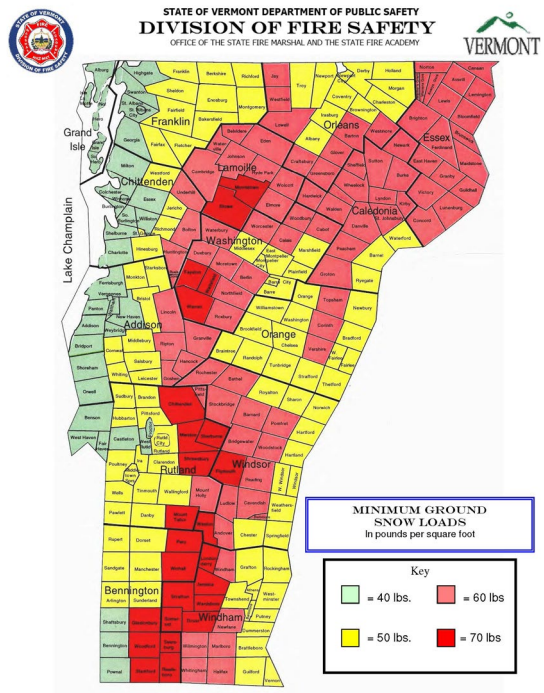
Hazard Not Profiled	Justification
Fluvial Erosion	There are no rivers in Town. There are only smaller intermittent and perennial streams that drain from springs and wetlands. This hazard is not a threat to the Town.
Loss of Electrical Service	Rarely occurs and typically a consequence of other hazards such as winter storm (ice storm). Utilities are privately owned and regulated by public safety board. Town has emergency power generator at Isle La Motte School.
Ice Jams	There are no rivers in Isle La Motte and therefore there is no hazard posed by ice jams.
Dam Inundation	There are no dams in Isle La Motte.
Structure Fire	There are on average 4 calls to the Fire Department related to structure fires in town each year. The Fire Department has set response procedures they follow structure fires. New construction follows state fire marshal codes.
Hazardous Materials	There are no large-scale hazmat storage sites or manufacturing facilities in town. Hazardous materials are mostly propane and gasoline. The Town Fire Departments follows set hazmat response protocols should a spill occur.
Drought	Has not occurred in memory. Dry conditions occur briefly in late summer if they occur at all.
Telecommunications Systems Failure	Typically accompanies another hazard such as power loss, winter storm (ice storm). Telecommunications infrastructure that serves town is privately held.
Tornado	Has never occurred in Town. Generally profiled under high winds.
Earthquake	A moderate scale earthquake has never occurred in Town. The Town does not lie near any fault zone. Refer to Vermont State Hazard Mitigation Plan for further information regarding earthquake risk.
Major Fire – Wildland	Large wildland fire complex has never occurred in Town. Small grass fire in spring and summer occur rarely and typically less than an acre in size. Town fire department has response procedures to handle hazard.
Terrorism / WMD and Civil Disturbance	Has never occurred in Town. Vermont State Police would be primary response agency for any terrorist type incident.
Extreme Temperatures	The Committee agreed that extreme temperatures a non-issue because they are brief in duration if they occur at all. Hot spells in summer and cold snaps in winter are just part of life in Isle La Motte and not a concern.
Hurricane	The Town is too far north from the Atlantic coast. Vermont does not have any coastline. Tropical storms are profiled under High Winds section.
Infectious Disease Outbreak	Has not occurred in Town. Considered rare.
Invasive Species	Considered rare. Town would rely on state to assist individuals and commercial ag producers in mitigation and response to invasive outbreak.
Rock Cuts	None in town.

Nuclear Power Plant Failure	Isle La Motte is approximately 190 miles northwest from the nearest nuclear power plant, which is the recently decommissioned VT Yankee Nuclear Power Plant owned by Entergy Nuclear Vermont Yankee, LLC.
Rockslide/Landslide	Do not occur in Town. No areas where rockslides are an issue.

The community has identified and chosen to focus mitigation action items on the following hazards: Severe Winter Storm/Ice Storm, Flooding, and Severe Thunderstorms (High Wind, Lightning, and Hail). These are the hazards that are most likely to occur in Isle La Motte Town and are the hazards the town has developed mitigation actions around.

Severe Winter Storm/Ice Storm

Minimum Snow Loads for Estimating Construction: Isle La Motte (50 lbs. /sq. ft.)



Description

Severe winter storms with snow, ice and freezing temperatures in various combinations are fairly commonplace in Isle La Motte. Such storms are accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Winter storms can cause roofs to collapse and limit access to areas and buildings around Town. Extreme cold often accompanies a severe winter storm or is left in its' wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. The last major winter storm affecting Isle La Motte occurred on December 20, 2013.

Impact and Geographic Area of the Hazard

Table 3 – Spring Snowfall in Burlington

Burlington, Vermont Top 10 Spring Snowfall Totals March - May					
Highest			Lowest		
Rank	Snowfall	Year(s)	Rank	Snowfall	Year(s)
1	52.7”	1933	1	0.1”	1945
2	47.8”	2001	2	1.0”	1903
3	45.7”	1971	3	2.0”	1910
4	41.2”	2016	4	2.7”	1927
5	37.7”	1974	5	3.1”	1934
6	36.4”	1916	6	3.2”	1991
7	36.1”	1997	7	3.9”	1946
8	34.4”	1994	8	4.0”	1905
9	34.3”	2017	9	4.1”	1915
10	33.9”	1983	10	4.2”	1921
Source: National Oceanic and Atmospheric Administration					

The primary impacts of a winter storms / ice storm typically include disruptions to transportation networks due to fallen limbs and trees, school closings and occasionally telecommunications and power outages. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards along roadways.

Winter storms / ice storms affect the entire Town and generally cause disruptions to public and private services. Construction standards for snow load (see map below) indicate that structures in Isle La Motte should be built to withstand loads of 40 pounds per square foot. At that point, design standards would be exceeded and the structure runs the risk of collapse. Given this standard, a snowstorm which dumped 40 inches of snow or 10 inches of ice would likely result in a few collapsed roofs, especially on structures which are not built to these standards.

Table 4 – Fall Snowfall in Burlington

Burlington, Vermont Top 10 Fall Snowfall Totals September - November					
Highest			Lowest		
Rank	Snowfall	Year(s)	Rank	Snowfall	Year(s)
1	24.0”	1900	1	0	2009/1948/1937/1915
2	23.0”	1921	2	0.1”	2004
3	21.9”	1906	3	0.2”	2015
4	20.4”	2002	4	0.4”	2010/1953/1930
5	19.5”	2018	5	0.5”	2003/1946/1941/1934/1918
6	19.4”	1910	6	0.7”	1999/1960/1894
7	19.2”	1971	7	0.8”	1982
8	18.8”	1968	8	0.9”	1988/1929
9	16.1”	1997	9	1.0”	1931
10	16.0”	1977	10	1.3”	1964
Source: National Oceanic and Atmospheric Administration					

The primary impacts of an ice storm typically include disruption to transportation networks due to fallen limbs and trees, school closings and occasionally telecommunications and power outages. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards along roadways.

Vulnerable populations, such as the elderly, those dependent on medical equipment and specialized health or physical care, are at risk to all types of winter storms. Also at risk are farms and livestock. Barns can collapse due to heavy snow and ice loads. Dairy cattle are susceptible to mastitis[1] if they are unable to be milked. Many larger dairy farms have stationary or portable PTO driven generators as back-up power for automated milking equipment. Also at risk are people who use electric heat in their homes when associated power outages occur.

[1] Mastitis is the inflammation of the mammary gland caused by microorganisms, usually bacteria that invade the udder, multiply and produce toxins that are harmful to the mammary gland.

Extent and Probability

The National Weather service defines a blizzard as "a storm which contains large amounts of snow or blowing snow, with winds in excess of 35 mph and visibilities of less than 1/4 mile for an extended period of time (at least 3 hours).

Winter storms / ice storms occur annually in Isle La Motte, typically in the form of a Nor'easter. Nor'easters occur most often in the winter and early spring, but also sometimes during the fall. These storms can leave inches of rain or several feet of snow on the region, and sometimes last for several days.

Table 5 – Winter Snowfall in Burlington

Burlington, Vermont
Top 10 Winter Snowfall Totals
December - February

Highest			Lowest		
Rank	Snowfall	Year(s)	Rank	Snowfall	Year(s)
1	103.4"	2007-08	1	18.4"	1912-13
2	97.9"	2010-11	2	20.4"	1979-80
3	96.9"	1970-71	3	21.9"	1928-29
4	90.1"	2009-10	4	23.6"	1936-37
5	81.7"	1965-66	5	24.0"	1898-99
6	80.7"	2003-04	6	25.0"	1904-05
7	80.0"	1957-58	7	25.6"	1940-41
8	79.4"	2008-09	8	26.3"	2011-12
9	78.6"	1946-47	9	27.0"	1900-01
10	75.7"	1969-70	10	27.4"	1960-61

Source: National Oceanic and Atmospheric Administration

Isle La Motte's recent history has not recorded any loss of life due to the extreme winter weather. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected. Impacts to future populations, residences, new buildings, critical facilities and infrastructure are anticipated to remain the same.

The Town is equipped to handle most winter emergencies, including maintaining road accessibility through various snow and tree debris removal equipment. The Town has access to private machinery, including bulldozers, plows, ATVs and snowmobiles, should they be needed in the event of an emergency. Heavy wet snows occurring during early fall and late spring and ice storms in the winter months are the cause of most power failures.

Past Occurrences:

According to the National Climate Data Center, there have been 45 winter storms events affecting Grand Isle County, Vermont including Isle La Motte between January 1, 1998 and 2019, totaling approximately $685.60 in property damages and no deaths in the region. Additionally, there was 1 severe ice storms in the region causing $250,000 in property damages and no deaths.

Table 6 – Winter Storms/Ice Events in Isle La Motte

Date	Location	Severity Remarks / Description of Area Impacted
January 6, 1998	Addison, Chittenden, Franklin, Grand Isle, Orange, and Windsor	DR 1201. This storm is referred to as the Ice Storm of 1998. Snow turned to freezing rain. Ice accumulations were generally between 1 and 2 inches with locally greater accumulations over portions of Grand Isle County. The impact on the region was dramatic. Trees and power lines snapped due to the weight of the ice. Power outages lasted for several days. Damage to the utility companies ran in the millions. With no electricity, the agricultural community was unable to milk cows with loss of income and damage to cows. Travel was dramatically impacted and many roads and bridges closed due to ice and fallen trees. The National Guard assisted with cleanup operations after the storm. Falling tree limbs and other debris was a significant

		hazard during and following the storm. It is not known what the financial losses were to the Town as a result of the storm. There was $1,500,000 in damages in Grand Isle County. Public Assistance funding was $5,899,183.
November 11, 2019	Grand Isle County	A widespread 5 to 9 inches of snow fell across Grand Isle County. Numerous vehicle accidents with schools closed and delayed.
February 12, 2019	Grand Isle County	A widespread 5 to 10 inches of snow fell across Grand Isle county.
January 19, 2019	Grand Isle County	A widespread snowfall of 10 to 15 inches occurred across Grand Isle county. There was approximately $10,000 in personal property damages mostly due to motor vehicle accidents.
November 15, 2018	Grand Isle County	A widespread 9 to 13 inches of snow fell in Grand Isle County. Some specific totals include; 13 inches in North Hero, 12 inches in Grand Isle and 9 inches in South Hero.
February 7, 2018	Grand Isle County	A widespread 5 to 10 inches of snow fell across Grand Isle County. Snowfall rates of 1 to 2 inches per hour was observed at times. Damage estimates were approximately $10,000 primarily to personal property due to motor vehicle accidents.
January 12, 2018	Chittenden, Franklin and Grand Isle Counties	Rain changed to a prolonged period of sleet Friday night before changing to snow after midnight. Sleet accumulated around 1/2 inch with snowfall of 4 to 8 inches. A flash freeze made traveling very hazardous.
March 14, 2017	Addison, Chittenden, Franklin and Grand Isle Counties	Blizzard conditions impacted Grand Isle county starting around 4-5 pm on March 14th and ended around midnight with frequent gusts in excess of 40-45 mph reported. Snowfall reports ranged from 18 to 24 inches. There were only a few isolated power outages but roads were impassable and the Grand Isle to Cumberland Head Ferry was closed.
February 12, 2017	State-wide	During the afternoon of February 12th, snow began across Vermont between 10 and 1 pm and fell steadily through the evening hours before slowly tapering during the overnight hours. A widespread 6 to 12 inches of snow fell with some localized higher amounts fell across Vermont. Impacts were largely travel related and nearly all school districts cancelled classes for February 13th.
December 29, 2015	Grand Isle County	A combination of snow and sleet accumulated 2 to 5 inches across Grand Isle county along with some light freezing rain at times. There was approximately $10,000 in personal property damages mostly related to motor vehicle accidents.
December 20, 2013	Addison, Chittenden, Franklin, Grand Isle, Lamoille, Orleans and	Two rounds of freezing rain accumulated around an inch across Grand Isle causing numerous vehicle accidents as well as damage to trees and utility lines. There were brief power outages during this time. There was an estimate of $250,000 of property damages from the event.

	Caledonia Counties	
February 25, 2010	Central and Northern Vermont	Heavy wet snow fell across the State that resulted in snowfall accumulations of 6 to 30 inches. The weight of the heavy snow accounted for widespread power outages across the region that resulted in upwards of 50,000 customers state-wide without power.
January 2-3, 2010	Central and Northern Vermont	Near record snow fell across the county from a powerful Atlantic storm system. Northwest winds of 15 to 25 mph with higher gusts caused considerable blowing and drifting snow with 4 to 5 foot snow drifts reported. A record 33.1 inches of snow fell at Burlington International Airport in South Burlington.
February 19 – 21, 2009	Northern Vermont	A prolonged flow of cool, moist and unstable air created persistent snow showers across the northern Counties during the afternoon of February 20th and continued until the early morning hours of February 21st. There were significant snowfall amounts (more than 12 inches) observed 1at various ski resorts. From 3 to 8 inches of snowfall accumulated within Grand Isle County and across the Champlain Valley.
January 29, 2009	Grand Isle County	Snow overspread the State early in the morning and continued into the evening hours. Snowfall accumulations with this storm were generally 8 to 14 inches in the County. There were no reported damages.
February 14, 2007	New England	Known regionally as the "Valentine's Day Storm". A winter storm blanketed most of New England. In Vermont, snow fell heavy at times from late morning through early evening 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 snow, making roads nearly impassable. Temperatures in the single numbers combined with brisk winds created wind chill values of 10 degrees below zero or colder.
October 20, 2006	Grand Isle County	A low pressure system brought cold air to the northern portion of the state. Heavy, wet snow accumulation of 3-6 inches occurred in Georgia damaging many trees and causing power disruptions.
December 6 – 14, 2003	Statewide	In December 2003 Vermont received two significant east coast storms, which produced 2 top ten snowfalls in Burlington. On December 7th snow accumulations were generally between 12 and 20 inches across eastern and central Vermont, and between 18 and 30 inches in Champlain Valley and northern/central Mountains of Vermont. On December 14th a storm system organized along the coast and provided the North Country with another significant snowfall.

		Snow developed Sunday afternoon and became heavy Sunday night into Monday morning. Snowfall amounts ranged from 10 to 30 inches across the region.
March 6, 2001	Statewide	Early Monday, March 5th, 2001 a developing winter storm formed off the coast. Deep Atlantic moisture interacted with cold air supplied by surface high pressure across the northern Great Lakes, to produce favorable conditions for a historic and long duration late season snowfall across northern New York and Vermont. Snow overspread Vermont and northern New York, Monday morning (March 5th) and became steady by afternoon and continued through the night before tapering off by late Tuesday, March 6th, 2001. The snow was heavy at times which produce near zero visibilities and extremely hazardous driving. Snowfall rates associated with this epic storm were between 2 and 4 inches per hour, especially across central and southern Vermont. Many schools and businesses were closed, and numerous towns postponed their Town meeting day. Generally, between 15 and 30 inches of snow fell except between 8 and 18 inches of snow fell in southern St. Lawrence. This storm produced snowfall amounts similar to the Valentine's Day snowstorm of February 2007, both of which are in the top ten snowstorms in WFO BTV history.
February 13, 2000	Grand Isle County	A storm system over the Ohio Valley tracked across central New England during Monday, February 14th. Heavy snow fell across the area with accumulations generally between 7 and 14 inches.
January 6, 1998	Addison, Chittenden, Franklin, Grand Isle, Lamoille, Orleans and Caledonia Counties	DR 1201. This storm is referred to as the Ice Strom of 1998. Snow turned to freezing rain. Ice accumulations were generally between 1 and 2 inches with locally greater accumulations over portions of Grand Isle County. The impact on the region was dramatic. Trees and power lines snapped due to the weight of the ice. Power outages lasted for several days. Damage to the utility companies ran in the millions. With no electricity, the agricultural community was unable to milk cows with loss of income and damage to cows. Travel was dramatically impacted and many roads and bridges closed due to ice and fallen trees. The National Guard assisted with cleanup operations after the storm. Falling tree limbs and other debris was a significant hazard during and following the storm. It is not known what the financial losses were to the Town as a result of the storm. There were $1,500,000 in damages in Grand Isle County. Public Assistance funding was $5,899,183.
April 10, 1996	Statewide	A classic Nor'easter, this system spread snow across the region for nearly two days. The snow tapered off to flurries by late evening on the second day. The heaviest snow fell over and east of the Green

		Mountains with 7 to 14 inches. In the Champlain Valley 2 to 5 inches fell with heaviest amounts above the 700-foot level. The wet snow resulted in some power outages and minor automobile accidents across the state.
February 28, 1995	Grand Isle County	A low-pressure system which developed in the Ohio Valley resulted in a mixture of snow, sleet, and freezing rain across Vermont. Snow accumulations ranged from four to eight inches across much of Grand Isle County.
March 13-14, 1993	State-wide	One of the worst storms of the century. Known as the "Blizzard of 93", it was one of the most powerful storms (Nor'easters) on record. The system moved up the Eastern Seaboard on the 13th and 14th coming close to breaking pressure and snowfall records in many locations. Snowfall amounts ranged from 10 to 28 inches across the state. Due to the weight of the snow that accumulated over March, there were numerous damage reports of barns and building roofs being damaged or at risk of collapsing.
January 3, 1993	Northern Vermont	A combination of a cold surface and warm moist air aloft created freezing rain and freezing drizzle across the state. Road surfaces in Grand Isle County were covered in "black ice". "Black ice" is a thin transparent form of ice allowing the black asphalt surface of a road to be seen through the ice. "Black ice" conditions typically result in numerous traffic accidents as motorists are unaware that the road surface is covered in ice.

The Town has classified severe winter storms/ice storms to be highly likely each year. Every winter there is a winter event where Town residents will have to address snow and ice build-up on personal property and the Town's public works department will have to ensure the roads remain clear of snow and ice.

Flooding

Description:
Historically in Vermont, flooding has been the number one natural disaster in loss of life and property. Most flash flooding is caused by heavy rain from thunderstorms. Smaller creeks and streams are particularly vulnerable to flash flooding. Flooding in Isle La Motte also comes from inundation, particularly along the shoreline of Lake Champlain.

It should be noted that fluvial erosion-related flooding is not addressed in this plan because there are only a few small perennial and intermittent streams within Town and no rivers. The town may choose to address this hazard in the future.

The following is the definition of flood, according to FEMA:

Flood: A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more properties (at least 1 of which is the policyholder's property) from:
--Overflow of inland or tidal waters; or
--Unusual and rapid accumulation or runoff of surface waters from any source; or
--Mudflow; or
--Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floodplain Mapping

According to the most recent data available from the Vermont Agency of Natural Resources, the Town of Isle La Motte has 6 flood insurance policies in force with $1,930,000 in insurance in-force and $2,737 total premiums. These residential structures, built prior to the Town enacting flood hazard ordinances, are located in low density residential areas and in flood hazard areas.

A GIS based overlay analysis was conducted using Flood Insurance Rate Map (FIRM) data with the Vermont E-911 data of structure locations. The results found that there are approximately 58 structures located within the 100 year flood plain in Isle La Motte: 2 are commercial sites, 10 are single family residential, 2 are mobile homes, and 36 are camps. This represents 11% of E-911 surveyed structures within the community.

The assessed value of all property in Isle La Motte is $114,887,157. Assuming a range of town-wide damage of 1% to 5%, a damaging flood could result in $1,148,871.57 to $5,744,357.85 of total damage excluding building contents. Impacts to future populations, residences, new buildings, critical facilities and infrastructure are anticipated to remain the same.

Extent / Probability

Flash floods and rain storms occur annually. According to the National Climatic Data Center, there have been 2 recorded flash flood events and 3 flood events causing approximately $50,000 and $15,000 in damages and 0 deaths respectively in Grand Isle County between 1998 and 2017.

Flash floods typically occur during summer when a large thunderstorm or a series of rain storms result in high volumes of rain over a short period of time. Higher-elevation drainage areas and streams are particularly susceptible to flash floods. Flash floods are likely in Isle La Motte, and potential damage to major transportation corridors.

Parts of Isle La Motte, such as Jordan Bay and sections of VT Route 129, are and will continue to be the parts of Isle La Motte most at risk for flooding from Lake Champlain. VT Route 129 and other roads in these areas may need to be elevated in places at some time in the future to minimize flood damage.

During the 2011 flood, VT Route 129, the only road access to Isle La Motte, was severely threatened due to flooding and waves from Lake Champlain. The Vermont Agency of Transportation needed to remove debris from the road daily. A more severe flood could pose serious access problems for residents of Isle La Motte. Flooding on VT Route 129 is of particular concern because this is the only means of vehicular access to the Town of Isle La Motte from the mainland of Vermont or New York.

There are no lake gauges in Isle La Motte. The closest gauge at the Echo Center in Burlington and the highest recorded measurement was 103.27 feet, which was measured on May 6, 2011. The average height of the Lake is 95.5 feet.

Past Occurrences:

There has been a total of 5 floods in Isle La Motte between 1998 and 2017 that have exceeded the USGS Major Flood Stage elevation (101.5 feet Above Sea Level) on Lake Champlain. The Lake has exceeded 100 feet in elevation approximately 12 times during that same time frame.

Table 7 Flood Disaster Declarations & Events

Date	Location	Severity Remarks/Description of Area Impacted
Flood Disaster Declarations		
April 23 – May 9, 2011 *Declaration made on June 15, 2011*	State wide.	DR 1995. Lake Champlain's waters reached a height of 103.27 feet above sea level (ASL) as measured at the USGS gauge at the Echo Center in Burlington. Flooding was exacerbated by waves caused by high winds.
July 18 - 21, 2008 *Declaration made on August 15, 2008*	State wide. Counties of Caledonia, Grand Isle and Lamoille qualified for Individual Assistance and Public Assistance.	DR 1784. Severe weather and thunderstorms came through most of Northern Vermont from Friday afternoon through the weekend. Some of these storms were very severe and there was an unconfirmed report of a tornado touching down. Multiple local roads were closed in the area. Damages were $53.06 per capita in Grand Isle County.
June 17, 1998 – July 13, 1998 *Declaration made on June 30, 1998.*	Addison, Caledonia, Chittenden, Essex, Franklin, Lamoille, Orange, Orleans, Rutland, Washington and Windsor Counties for Individual Assistance and Public Assistance	FEMA-1228-DR. Severe storms and flooding throughout the state.
April 24, 1993	Addison, Chittenden, Franklin, and Grand Isle Counties for Individual Assistance and Public Assistance.	DR 990. The Town experienced received minimal damages from the rain event. There were $1,348,800 in public assistance funding made available to affected communities.
Flood Events		
2011	Grand Isle, Addison and Chittenden Counties	Lake Champlain's waters reached a height of 103.27 feet above sea level (ASL) as measured at the USGS gauge at the Echo Center in Burlington. Flooding was exacerbated by waves caused by high winds.
April 20- 30, 2007	Grand Isle, Addison and Chittenden Counties	A minor shoreline flooding occurred due to strong winds and wave action along the shoreline. Several summer camps and cottages experienced flooding and a few docks were damaged as well. The lake remained above flood stage through the end of April. There was $20,000 in damages reported between the Counties.
April 23 to May 9, 2001	Counties of Grand Isle, Addison, Chittenden, Franklin and Rutland.	Spring snow melt and associated runoff resulted in flooding along the shores of Lake Champlain. Lake levels reached the 100.99 foot level (flood stage is 100

		feet). There was approximately $21,000 in damages County-wide in April and approximately $17,000 in damages in May between the Counties.
July 1, 1998	Grand Isle County.	Heavy rain during the morning resulted in flooded roads in Isle La Motte. Several homes had flooded basements. There was approximately $50,000 in property damages.
April 1 - 13, 1998	Counties of Grand Isle, Addison, Chittenden, and Franklin.	Spring runoff and flood waters resulted in the Lake Champlain lake level to exceed the 101 foot level during this period. The maximum level reached this year was 101.82 feet on April 5. Flooding of lake shore areas became widespread with water closing some roads and flooding some private property. Due to the high lake level, water back flowed up the rivers that flow into the lake. Some residents were forced to sandbag to protect property. There was an estimated $40,000 in property damages across the four Counties.
November 9, 1996	Grand Isle County.	A strong cold front moved slowly across New York State resulting in periods of heavy rain. Isle La Motte reported a storm total rainfall of 4.46 inches. Culvert and field flooding was reported in throughout the County resulting in approximately $50,000 in damages.
May 12 - 24, 1996	Grand Isle, Chittenden and Franklin Counties.	Continued runoff into Lake Champlain resulted in the lake level rising above the 100 foot mark with minor lake shore flooding. The highest level recorded during this period in May of 1996 was 100.90 feet on May 16, 1996. $15,000 in property damages were reported.
May 2 – 8, 1996	Grand Isle, Chittenden and Franklin Counties.	Runoff from melting snow and rainfall resulted in the Lake Champlain Lake level reaching or exceeding 100 feet. There was some minor flooding along the lake shore during this period. There were approximately $15,000 in damages across the affected Counties.
January 19, 1996	Caledonia, Essex, Grand Isle, Lamoille, Orange, Orleans, Washington, Addison, Chittenden, Franklin, Rutland, and Windsor Counties.	A strong winter storm triggered flooding and high winds throughout the County. Power was lost temporarily. The flooding damaged many roads throughout Isle La Motte. Damage estimates were $2,800,000 for the area affected.
April 16, 1994	Grand Isle County	A flood event caused approximately $500,000 in property damages county-wide.
May 1, 1993	Grand Isle County	A low pressure system settled over the region producing heavy rains. Several local roads were inundated with flood waters due to blocked culverts. There was an estimated $500,000 in damages county-wide.

Severe Thunderstorms (High Winds, Lightning, Hail)

Description

Thunderstorms are caused by an updraft, which occurs when warm, moist air rises vertically into the atmosphere. The updraft creates a cumulus cloud, which will eventually be the thunderstorm cloud. Severe thunderstorm winds are brief in duration and bring gusts in excess of 50 mph. Severe thunderstorms are capable of producing high winds, large hail, lightning, flooding, rains, and tornadoes.

The National Weather Service (NWS) issues a wind advisory when winds are sustained at 31 to 39 mph for at least one hour or any gusts 46 to 57 mph. Winds of 58 mph or higher cause the NWS to issue a High Wind Warning. In Vermont, high winds are most often seen accompanying severe thunderstorms. In fact, straight-line winds are often responsible for most of the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds.

Impact and Geographic Area of the Hazard

The Town has experienced a variety of high winds from storm systems that typically develop west from the Great Lakes and travel east over the Adirondack Mountains in Northern New York. Typically, high winds accompany strong thunderstorms that often generate lightning and/or hail. Micro bursts with high wind speeds and high precipitation accumulations over brief periods often down trees, branches, and power lines and can overwhelm local drainage networks for brief periods. There are rare instances where lightning has caused structure fires (barns) and grass fires during dry periods.

High winds are a hazardous threat to the Town and most commonly accompany other storm events. Violent windstorms are possible in Isle La Motte. High winds associated with severe thunderstorms affect forested areas, utility lines and exposed property and are common along the Lake Shoreline corridor throughout Town.

Table 8 Beaufort Wind Chart (source: NOAA)				
Force	Wind (Knots)	WMO Classification	On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, Smoke rises vertically.
1	1-3	Light air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh breeze	Moderate waves 4-8 ft taking longer form, may whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests beginning to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs.
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, “considerable structural damage”
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility reduce	Widespread structural damage.
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	Widespread structural damage.

There are no loss estimates for lightning because it is extremely difficult to predict where the event will occur and the type of associated structural damage. Damages could come in the form of destroyed electrical appliances, structure fires, or wildland fires. Death or serious injury could occur to individuals exposed to lightning. Private properties in Isle La Motte have experienced lightning strikes. High elevations and areas around bodies of water such as lakes and ponds are more susceptible. Isle La Motte’s road crew is equipped with associated debris removal equipment.

Extent/Probability

There have been 31 thunderstorm events in the region since January 1, 1998 according to the National Climatic Data Center. Of those, all are classified as severe thunderstorms with wind speeds of 50 kts. or greater. Severe thunderstorms can cause power outages, property damage, transportation interruptions, affect businesses and can cause loss of life. Micro bursts with high wind speeds and high precipitation accumulations over brief periods often down trees and branches and power lines and can overwhelm local drainage networks for brief periods. Micro bursts have occurred almost annually in the past 10 years.

Table 9. Tornado and Storm Research Organization (TORRO) Hailstorm Intensity Scale

TORRO Scale	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m^2	Typical Damage Impacts
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5-15	>20	Slight general damage to plants, crops
H2	Significant	10-20	>100	Significant damage to fruit and crops, damage to glass and plastic structures, pain and wood scored
H3	Severe	20-30	>300	Widespread glass damage, vehicle bodywork damage
H4	Severe	25-40	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60	-	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75	-	Severe roof damage, risk of serious injuries
H8	Destructive	60-90	-	Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	-	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	-	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Lightning strikes in Grand Isle County average between 4-6 strikes per square mile each year based on data collected by NASA satellites between 1995 and 2002. Within the Town of Isle La Motte, these numbers would average 1-2 lightning strikes every 5 years. There is very little data on lightning strikes in Town.

Hailstorms usually occur in Vermont during the summer months and generally accompany passing thunderstorms. While local in nature, these storms are especially significant to area farmers, who can lose entire fields of crops in a single hailstorm. Large hail is also capable of property damage. There have been 49 recorded hail events in Franklin County between 1998 and 2018. Hail is considered a relatively infrequent occurrence. Those hail events that do occur tend to be highly localized and limited to a relatively small area and typically occur with thunderstorms.

It is extremely difficult to predict where the event will occur and the type of associated structural damage. The estimated damage from a severe thunderstorm event occurring to 10% of all structures in Town with 20% damage is $2,297,743.14. The estimated cost does not include building contents, land values or damages to utilities. There are no known deaths that have occurred in Town due to severe thunderstorms.

Past Occurrences

Private properties in Isle La Motte have experienced lightning strikes however, no data on lightning strikes in Town is kept. The Town's Highway and Fire Departments have appropriate debris removal equipment to clear trees and limbs from following thunderstorms.

Loss estimates for lightning are difficult to ascertain because it is extremely difficult to predict where the event will occur and the type of associated structural damage. Damages could come in the form of destroyed electrical appliances, structure fires, or wildland fires. Death or serious injury could occur to individuals exposed to lightning.

Table 10. Severe Thunderstorm Events

Date	Location	Severity Remarks / Description of Area Impacted
May 4, 2018	Counties of Grand Isle, Chittenden, Lamoille, Orange, and Orleans	Winds up to 60-80 mph occurred across the five affected counties. Strong winds and microbursts created power outages throughout the state. Several trees were knocked down in Grand Isle County. Hail showers were also reported among the counties. $44,096.31 was distributed to communities after the storm for damages.
October 29-30, 2017	Counties of Grand Isle, Addison, Chittenden, Essex, Franklin, Lamoille, Orange, Orleans, Washington and Windham	From October 29-30, a strong thunderstorm fueled by an ex-tropical storm brought damaging winds to Vermont, causing power outages and knocking trees down throughout the state. Winds reached over 70 mph at times and rain caused flooding. Estimated damages were $4,687,401.61 across all of the involved counties. Grand Isle County's countywide per capita impact was $10.18.
December 26, 2016	Grand Isle County	Sustained winds of 20 to 25 mph with numerous gusts in excess of 40 mph was observed across much of the Champlain Valley with sustained 25 to 35 mph with gusts in excess of 50 mph along the immediate lake shore of Lake Champlain. Numerous observations of 50-55 mph gusts occurred, largely between 2 pm and 10 pm. Several branches were downed by winds and there were resultant power outages affecting approximately 5000 customers. The Lake Champlain Ferry crossing between Grand Isle, VT and Cumberland Head (Plattsburgh), NY was closed due to the strong winds.
September 11, 2016	Statewide	A cold front moved across the region from Canada and was accompanied by high winds. Many trees were uprooted. NWS recorded windspeeds up to 60kts. Damage estimates were $50,000.
July 23, 2016	Chittenden Franklin, Grand Isle, Lamoille and Addison Counties	A significant cold front and strong mid-level disturbance caused numerous thunderstorms to develop in Quebec province Canada by late morning then travel and intensify across VT during the afternoon. Wind speeds were estimated at 50kts. Significant and widespread damage occurred with more than 20,000 utility outages.

October 29, 2012	Statewide	Superstorm Sandy brought high winds along the western slopes of the Green Mountain. Much of the state experience 50 knot wind speeds. Strong east winds of 25 to 35 mph, enhanced by downslope from the Green Mountains caused frequent wind gusts in excess of 45 mph with isolated wind gusts to 60 mph along western slope communities. Scattered tree limbs, branches and small trees were toppled by these winds, which accounted for scattered power outages as well. Damage estimates were $10,000.
May 9, 2012	Northern Vermont	A warm, humid and unstable air mass was draped across the region in the afternoon with an approaching cold front from Ontario, Canada. Numerous thunderstorms developed ahead of the cold front during the afternoon crossing New York into Vermont. There were numerous reports of hail greater than an inch in diameter. Wind speeds were estimated at 50kts according to NWS. Trees were downed around Town. There was an estimated $5,000 worth of damages.
July 21, 2010	Grand Isle County, Isle La Motte	During the afternoon and evening, scattered to numerous thunderstorms developed traveled across northern New York and through Vermont. Several storms strengthened into supercells that produced widespread wind damage to trees, power poles and structures. Several reports of quarter size diameter hail across Isle La Motte.
July 18, 2008	Grand Isle, Franklin and Lamoille Counties	On July 18th, 2008, a significant severe weather outbreak occurred across northern New York and central and northern Vermont. Thunderstorms first developed across the northern Adirondack Mountains in the afternoon, then traveled east into Chazy, New York, through Grand Isle County, Vermont, then down the Lamoille River Valley to Waterville, Vermont. A second cluster of storms developed across southern Ontario, Canada and tracked across portions of eastern Vermont. This particular severe weather outbreak produced over two dozen severe weather reports, with the primary damage being caused by strong and damaging straight line wind gusts. In Isle La Motte, damage was due to straight line thunderstorm winds of approximately 70 to 80 mph, based upon NWS radar analysis. The damage path was about 10 to 15 miles long. The damage started around 3:00 PM through Chazy, New York then moved over Lake Champlain, impacting some of the island communities before reaching the eastern shore of the lake. The hardest hit areas were around Chazy and the town of Isle La Motte, especially along portions of West Shore Road. The open waters of Lake Champlain allowed the winds to accelerate before coming ashore in Isle La Motte and caused damage to dozens of homes and downed hundreds of trees. The widespread severe thunderstorms resulted in over 20,000 customers losing power across northern New York and Vermont during the event.
August 16, 2007	Grand Isle County	A cold front tracked slowly across northern New York and Vermont. Numerous trees and powerlines down in Grand Isle County, which blocked and closed several roads including Route 2. Trees fell and trapped drivers in two vehicles with no injuries reported. Wind speeds were estimated at 70 kts. Wind damage in the form of trees piercing through roofs, crushed vehicles, docks and patios torn off to several camps along the west shore. Estimated damages were $250,000.

June & July, 2007	Isle La Motte	Hail storms produced widespread crop damage throughout Isle La Motte.
June 19, 2006	Grand Isle County	A cold front moved southeast from Canada and triggered late afternoon and evening thunderstorms. Dime size hail was reported in the County. Estimated property damages were $5,000.
February 17, 2006	Counties of Grand Isle, Chittenden, and Franklin.	On an arctic front entered the Champlain Valley of Vermont. Sustained winds of 30 to 40 mph with damaging wind gusts in excess of 60 mph moved across the region between late morning and midafternoon. There were widespread reports of trees and power lines down across. There was an estimated $150,000 in property damages within the affected area.
September 29, 2005	Counties of Grand Isle and Chittenden.	A storm system moved rapidly out of Quebec, Canada. The associated cold front moved across western Vermont and was accompanied by showers and thunderstorms. Damaging winds preceded and followed the front. Trees and power lines were blown down countywide across both Grand Isle and Chittenden counties, and thousands were without power for a time. Winds were generally estimated at sustained of 40 to 45 mph with gusts over 50 mph. Property damage estimates for the 3 Counties were $250,000.
October 16, 2005	Counties of Grand Isle, Addison, Chittenden, Franklin and Rutland.	Strong winds from Canada swept across Vermont. There were brief power disruptions, downed trees and associated damages to residential property throughout Town. Property damage estimate were approximately $35,000 for the 5 County area.
July 8, 2004	Grand Isle County	A low pressure system from Canada moved into the area and produced a series of strong thunderstorms. There were reports of nickel sized hail that fell across the County. There are no damage estimates from the event.
February 10, 2001	Grand Isle County	A strong storm system moved across Quebec, Canada. The associated cold front brought high winds across the County. Damage estimates were $10,000.
August 10, 2001	Isle La Motte	Early morning storms brought lightning to the area.
September 17, 1999	New England	Remnants of Tropical Storm Floyd moved across eastern New England. Strong winds combined with saturated soils from heavy rain resulted in trees and power lines blown down. A few boats were damaged along the shores of Lake Champlain. The strongest winds reported were 43 knots (50 mph) in Isle La Motte and on adjacent Lake Champlain. Rainfall across the county associated with the remnants of Floyd was 3 1/2 to 4 inches. Property damages was estimated to be $50,000 and crop damage estimates at $10,000.
June 22, 1998	Isle La Motte	A series of strong thunderstorms occurred over the Grand Isle County. One lightning strike struck a barn in the Town of North Hero causing $10,000 in damages.
February 15, 1995	Grand Isle and Franklin Counties.	A strong pressure gradient across the state resulted in wind gusts over 50 knots across parts of the Champlain Valley. Property damage estimates for were $50,000.

December 26, 1993	Statewide	A strong pressure gradient developed across the state in the wake of an arctic front resulting in high winds and damage in parts of every county. Trees and tree limbs were downed resulting in significant damage in some areas. Numerous power outages were reported across the state. Property damage estimates state-wide were $500,000.

6. ASSESSING VULNERABILITY

While Isle La Motte has identified severe winter storm/ice storm, flooding, and severe thunderstorms (High Wind, Lightning, and Hail) as its most common hazards, only flooding is covered in the following section. Flooding is the easiest hazard to assess specifically in terms of the vulnerability of both public and private property. Winter storm/ice storm and severe thunderstorms are much more unpredictable in terms of how they may impact property in Isle La Motte.

Structures in the SFHA

There are approximately 58 structures within FEMA-designated Special Flood Hazard Areas (SFHAs)[2]. Properties within SFHAs, that have a mortgage, are required to purchase flood insurance. Isle La Motte's participation in the National Flood Insurance Program (NFIP) gives residents and business owners access to discount flood insurance through the National Flood Insurance Program. Flood insurance can still be purchased privately, however it is more expensive. Development in SFHAs must meet additional construction standards as outlined in Isle La Motte's floodplain regulations.

Repetitive Loss Properties

According to the State Hazard Mitigation Officer, the Town of Isle La Motte has no repetitive loss properties. The definition of severe repetitive loss as applied to this program was established in the National Flood Insurance Act. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart. [3]

Critical Facilities

A critical facility is defined as a facility in either the public or private
sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the appropriate jurisdictions, or fulfills important public safety, emergency response, and/or disaster recovery functions.

The critical facilities identified in the Town of Isle La Motte Hazard Mitigation Plan, listed fully in Attachment A, include shelters; government offices; fire station, hazardous materials storage sites; and the school.

[2] Flood Hazard Summary Report for Isle La Motte, available on VT ANR's Floodready website <https://anrweb.vt.gov/DEC/FoFReports/>
[3] FEMA <http://www.fema.gov/severe-repetitive-loss-program>

Participation and Compliance with the National Flood Insurance Program (NFIP)

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

FEMA published a flood hazard study for the Town of Isle La Motte in 1979. Flood Insurance Rate Maps (FIRMs) were prepared by FEMA in 1980. Flood hazard areas were identified along the brooks and streams that run through the town, in the area known as the "Marsh" and along Lake Champlain. The FIRMs and Study are available for review on-line at FEMA.gov.

Adoption of an ordinance regulating the Flood Hazard District enables Isle La Motte to be eligible for FEMA's National Flood Insurance Program (NFIP), which permits residents within the Flood Hazard District to purchase flood insurance. The purpose of the district is to prevent increases in flooding caused by development in flood hazard area, to minimize future public and private losses due to floods, and to promote the public health, safety and general welfare. The Town is committed to enforcing floodplain regulations and ordinances to be eligible to participate in the NFIP program and protect the people and property of Isle La Motte by restricting development in flood prone areas. Isle La Motte is a member in good standing with the NFIP (CID 500224). The Town will continue to ensure future compliance with the NFIP by making sure that local regulations meet NFIP minimums and conducting enforcement as necessary.

The latest record indicates that there are 6 active NFIP policies in Isle La Motte. The policies have a total coverage value of $1,930,000. There have been 0 NFIP claims filed in Isle La Motte since 1978 totaling $0.

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

Market Values of Structures in Isle La Motte

Table 11 Market Value of Structures in Isle La Motte[1]		
Type	**Number**	**Value Including Land**
Residential Homes	196	$39,033,600
Seasonal Homes	78	$18,304,200
Mobile Homes – Unlanded	314	$3,433,100
Mobile Homes - Landed	30	$2,821,500
Farms	1	$230,500
Commercial	24	$8,786,200
Commercial Apts	1	$94,000
Other (Utilities, Woodland and Miscellaneous)	243	$42,098,757
Total Listed Value	887	$114,801,857

7. MITIGATION STRATEGY

The following hazard mitigation goals are adopted by Isle La Motte as a part of this plan:

General Goals

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

Existing Hazard Mitigation Programs, Projects and Activities

The following is a list of existing hazard mitigation programs, projects, and activities in Isle La Motte:

Flooding & Landslide

- The Town has flood zone regulations which designate a Flood Hazard District whose purpose is to minimize future public and private losses caused by development in flood hazard areas.
- The town participates in the National Flood Insurance Program (NFIP). Maintaining compliance with NFIP regulations both now and in the long term is a high priority activity.
- Flood Hazard Areas in Isle La Motte are identified on Flood Hazard Boundary Maps (FHBMs) and Flood Insurance Rate Maps (FIRMs) produced by FEMA (from 1980). The purpose of these districts, which are located along the flood plains of rivers and streams throughout the Town, is to prevent increases in flooding caused by excessive development of lands within flood hazard areas.

- Ditches located in areas susceptible to flooding are inspected and maintained on an annual basis. Ditches in general are inspected and cleaned
- Culverts are inspected at least once a year. Seasonal maintenance is developed based on an annual inspection.

Severe Winter Storms (Ice Storm)
- Town Highway Department has snow removal equipment.
- Shelter agreement between Isle La Motte School and American Red Cross are renewed on a semi-annual basis.
- Road crews have response equipment to deal with downed trees and branches.

Structure Fire and Wildland Fire
- Annual Insurance Service Office (ISO) inspection.
- Fire fighter personal protection equipment upgrades through Federal grant programs.
- Upgrades to fire-fighting offensive and defensive equipment through Federal grant programs.
- Fire fighter training through Vermont Fire Academy.
- Member of Grand Isle County Mutual Aid Association.
- NIMS/ICS Training for members to meet state NIMS strategy.

Loss of Electrical Service
- Isle La Motte School has a stationary generator and transfer switch for use as a community shelter.
- On-going regularly scheduled road maintenance programs includes cutting vegetation away from utility lines.

On-Going Mitigation and Preparedness Activities
- Town is interested in State and Federal funding for mitigation projects and activities.
- Town applies for state grants (Local Roads, Bridge and Culvert) to address road construction/improvement projects.
- Regularly scheduled maintenance programs ongoing (culvert survey & replacement, ditching along roadways, cutting vegetation to allow visibility at intersections).
- Traffic calming and alternate transportation project.
- Town has mapped critical facilities and infrastructure.
- Continue to identify and equip, as appropriate community shelters.
- Community participates in the Vermont Enhanced 911 System.

Identified Hazard Mitigation Actions, Programs, and Activities

The following list documents the questions (criteria) considered by the town of Isle La Motte when established as a priority for future hazard mitigation projects. Each of the following criteria was rated according to a numeric score of "1" (indicating Poor), "2" (indicating Average) and "3" (indicating Good). The highest possible score is 36. The full scoring matrix used is located as an appendix.

1) Does the action reduce damage?
2) Does the action contribute to community objectives?
3) Does the action meet existing regulations?
4) Does the action protect historic structures or structures critical to Town operations?
5) Can the action be implemented quickly?
6) Is the action socially acceptable?
7) Is the action technically feasible?

8) Is the action administratively possible?
9) Is the action politically acceptable?
10) Is the action legal?
11) Does the action offer reasonable benefits compared to its cost of implementation?
12) Is the action environmentally sound?

Mitigation actions are listed in terms of mitigating threat or risk to public health and safety, reduction of hazard to community assets, adherence to Town plan and local ordinances, cost, and feasibility. Actions are classified as either short - term or long - term activities. Short –term action items are activities which the municipality may be capable of implementing within one to two years. Long-term action items may require new or additional resources, funding or authorities. Ongoing action items occur at least once per year. A matrix of the priority scoring results is in Attachment B.

The following identified programs, projects and activities are future mitigation strategies for the Town of Isle La Motte. These mitigation strategies have been chosen by the town as the most appropriate policies and programs to lessen the impacts of potential hazards.

Cost-Benefit Analysis

Each project will incorporate a full benefit-cost analysis (BCA) following FEMA's BCA methodology and latest software to ensure cost effectiveness and maximize savings.

There was a rough cost/benefit analysis done for each project listed in the table. The below cost and benefits tables address the priorities for the mitigation strategies that are stated in the Mitigation Actions Table.

Cost Estimates

High	=>$100,000
Medium	= $25,000 – 100,000
Low	=< $25,000

Benefit Estimates

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

Time Frame

Short term	6 months to one year
Medium term	1 – 3 years
Long term	4+ years

Implementation of the mitigation actions is summarized in the below table, as far as who, when and how they will be carried out. Further details about some actions can be found following the mitigation actions table, in text.

Table 12. Mitigation Projects

Priority /Score	Mitigation Action / Hazard Addressed	Responsibility/ Oversight	Funding Source	Timeframe	Cost / Benefit	Status

High 33	Bank Stabilization along West Shore Road (16 sites) / Flooding	Selectboard	VT Better Roads Grant / Town Budget	Start April 2023; complete by August 2026	High /High	Apply for grant. Hire engineering firm. Site assessment, Engineering/design. Permitting needed.
High 33	Drainage improvements West Shore Road (north of School St intersection) / Flooding and erosion	Selectboard	VT Better Roads Grant / Grants in Aid / State Mitigation Grants	Start May 2023 complete by August 2023	Low / High	Apply for grant(s). Site assessment. Stream alteration permit may be needed. Construction.
High 33	Drainage improvements West Shore Road (800 feet north of Fisk Point Road intersection) / Flooding and erosion	Selectboard	VT Better Roads Grant / Grants in Aid / State Mitigation Grants	Start May 2023 complete by August 2023	Low / High	Apply for grant(s). Site assessment. Hydro study. Stream alteration permit. Construction.
High 33	Bank Stabilization along East Shore Road (14 sites) / Flooding and erosion	Selectboard	VT Better Roads Grant / Town Budget	Start spring 2022; complete by October 2025	High / High	Apply for grant. Hire engineering firm. Site assessment, engineering/design. Permitting needed.
High 33	Drainage improvements East Shore Road (0.5 mile north of Nobles Hill Road intersection) / Flooding and erosion	Selectboard	VT Better Roads Grant / Grants in Aid / State Mitigation Grants	Start May 2023 complete by August 2023	Low / High	Apply for grant(s). Site assessment. Construction.
High 30	Generator at Elementary School / All Hazards	Selectboard	Town Budget/ Grant	Summer 2023	Low/ Medium	Town will explore grant opportunities to purchase a generator for the School.
High 30	Incident Command Systems Training / All Hazards	Selectboard	Town Budget	Spring 2022	Low / High	The Selectboard will participate in ICS training.
High 29	Generator at Fire Station / All Hazards	Selectboard	Town Budget/ Grant	Summer 2022	Low/ Medium	Town will explore grant opportunities to purchase a generator for the Fire Station.
High 29	Support Power Utility Efforts to Protect Utility Corridors (tree / branch removal. Severe Winter Storm (Ice Storm), Severe Thunderstorm (High Wind, Lightning, and Hail)	Selectboard	Utility	On-going	Low / High	Support power utility standards of in identifying utility corridors in need of tree pruning.

<u>Summary of Mitigation Projects</u> – The following is a summary of each mitigation project identified by Isle La Motte:

Bank Stabilization along West Shore Road (north of School St.) – This action will reduce a long-term vulnerability of West Shore Road from flooding and related erosion. West Shore Road is located directly next to Lake Champlain along the west side of Isle La Motte. Many sections of this road have historically flooded and been at risk of erosion. There are 16 segments each 100 meters in length that were identified as needing some drainage improvements to reduce flooding and erosion risks. The Town has completed 3 seawall projects along the road in past 7 years to combat erosion of the bank and protect the road from flooding.

The proposed project is to further protect West Shore Road from the threats posed by flooding by implementing further bank stabilization project in key locations to ensure the road is protected and passable during a flood event. This includes adding rip rap or a wall near the State boat ramp at Stoney Point Access Area.

Drainage improvements West Shore Road (north of School St intersection) – This action will reduce a vulnerability of West Shore Road from flooding and related erosion. The site, which is just north of the intersection with school street, was assessed in 2020 under the Municipal Roads General Permit (MRGP) program. The existing 60' long metal culvert is deteriorating and should be replaced consistent with the VAOT's MRGP road standards. The culvert outlet needs to stabilized and the approaching ditch lined with stone.

Drainage improvements West Shore Road (800 feet north of Fisk Point Road intersection) – This action will reduce a vulnerability of West Shore Road near Fisk Point from flooding and related erosion. The site was assessed in 2020 under the Municipal Roads General Permit (MRGP) program. The existing metal culvert on this gravel road is deteriorated at the bottom causing local flooding and erosion around the site. The culvert should be upgraded consistent with the VAOT's MRGP road standards.

Bank Stabilization along East Shore Road – This action will reduce a long-term vulnerability of East Shore Road from flooding and related erosion. East Shore Road runs parallel to Lake Champlain along the east side of Isle La Motte. Many sections of this road have historically flooded and been at risk of erosion. The road was assessed as part of the town's road erosion inventory under the State's Municipal Roads General Permit program. There are 14 segments each 100 meters in length that were identified as needing drainage improvements to reduce flooding and erosion risks. The Town has completed several projects along the road in recent years to combat road shoulder erosion and protect the road from flooding during events.

Drainage improvements East Shore Road (0.5 mile north of Nobles Hill Road intersection) – This action will reduce a vulnerability of East Shore Road from flooding and related erosion. The site, was assessed in 2020 under the Municipal Roads General Permit (MRGP) program. The existing 18" culvert is deteriorating and should be replaced consistent with the VAOT's MRGP standards. The culvert outlet, which directly discharges into lake, is eroding the lakeshore. Outlet area needs to be stabilized to reduce erosion. Drainage to outlet needs stabilized as well to reduce water velocity and to decrease sediment from entering lake.

Generator at Elementary School - This action will reduce a long-term vulnerability for the Elementary School which is identified as community shelter when power outages occur. It will ensure that the Town will have a facility to serve the sheltering needs of the public during an emergency where loss of electricity occurs. Single phase diesel generators typically cost under $10,000.

Incident Command Systems Training – Selectboard members will annually attend an incident command systems training in the state or through FEMA. Attending this training will ensure that the Selectboard is familiar with incident command systems and will be able to utilize the system in the event of a disaster. ICS trainings are typically free of charge and available in person or on-line at various times of the year.

Generator at Fire Station - This action will reduce a long-term vulnerability for the Fire Station when power outages occur. It will ensure that the Fire Station will be able to continue all needed functions in the event of a loss of electricity. Single phase diesel generators typically cost under $10,000.

Support Power Utility Efforts to Protect Utility Corridors – This action will reduce a long-term vulnerability for the Town. The utility lines are privately owned; however, the Town will support the power company's utility line and corridor tree pruning program in order to protect power lines. Trees or branches that are a concern to impact utility lines will be reported to the power company. The power company has improved upon their line corridor tree pruning program to reduce the impacts of ice storms and falling trees/branches in recent years.

Existing Planning and Regulatory Capabilities

Isle La Motte is a rural town with a low population. The Town staff includes a part-time Town Clerk/Treasurer and an Assistant Town Clerk/Treasurer, and a part-time floodplain manager. This is no Town Highway Department staff. Instead, the Town contracts all highway work. The full-time staff size is similar to other towns in northern Vermont of similar size. They have a volunteer Selectboard and Planning Commission.

The town has no local police department. Vermont State Police and the Grand Isle County Sheriffs' Department cover all areas of law enforcement from traffic violations to major crimes. The town currently contracts with the County Sheriff for additional coverage and help with enforcement of local traffic ordinances.

Isle La Motte has a Volunteer Fire Department is staffed by well-trained and devoted volunteers. The Department responds to fire, rescue, and marine calls in Isle La Motte and offers aid to neighboring towns' fire departments as needed. In addition, Alburgh Fire Department and Rescue provides emergency medical services for Isle La Motte. The main funding of the operations of these organizations is through public contributions. The fire department is housed at 2241 Main Street. Alburgh Fire Department Rescue operates out of its station in Alburgh Village with two fully equipped ambulances and with volunteer crew members.

One of the strains on the town's emergency personnel is that Isle La Motte draws a lot of recreational visitors during the summer for lake recreation activities and bicycle tours, during the fall for the colorful foliage season and apple harvest, and during the winter for ice fishing. Weekend traffic through Isle La Motte increases greatly during the summer season from May to September and in the fall during September and October. The town's capabilities are limited for such an increase in traffic. During peak summer season, emergency resources could be tied up dealing with motor vehicle accidents and boating incidents, so Isle La Motte relies on mutual aid at times.

How this Plan will Improve Existing Capabilities

The following policies, programs and activities related to hazard mitigation are currently in place and/or being implemented in the Town of Isle La Motte. In cooperation with NRPC, the Town Emergency Management Coordinator (a member of the Selectboard) analyzed these programs for their effectiveness and noted improvements needed. Isle La Motte uses all of the plans listed below to help plan for current and future activities with the town. For example: the Local Emergency Operation Plan has a contact list that is used for response purposes in the case of a hazard event, and is updated every year after Town Meeting. Town Road and Bridge Standards are followed by the town and they do an annual culvert and bridge inventory that is mapped by the NRPC. The town is compliant with the NFIP.

As Isle La Motte goes through the update process for the planning mechanisms outlined in the table below, the Town will look to the Hazard Mitigation Plan's Table of Actions and Risk and Vulnerability Assessments to help guide land use district decisions, and guide goals and policies for those districts. The Local Emergency Operations Plan contact list should be updated after Town Meeting each year, including updates to vulnerable geographic

locations, as well as locations of vulnerable populations. Updates to each of the planning mechanisms outlined in the table below are handled by the responsible party identified in the table. There is no timeframe for updating the below referenced plans and regulations to better incorporate hazard mitigation, however, as each document is updated the hazard mitigation plan will be reviewed for incorporation.

The following authorities, policies, programs, and resources related to hazard mitigation are currently in place and/or being implemented in the Town of Isle La Motte in addition to the NFIP. These programs reduce the effects of hazards to existing, new, and future buildings, infrastructure, and critical facilities by preventing their location in identified hazard areas and ensuring that infrastructure and buildings are designed to minimize damage from hazard events. The Town has analyzed these programs for their effectiveness and noted any improvements that may be needed. Other mitigation/emergency planning related documents and their status are outlined in the below table:

Table 13 Town Policies and Plans

Existing Protection	Description	Effectiveness/Enforcement/ Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
NFIP Ordinance	Restrictions on development in potential hazardous areas such as steep slopes, floodplains. Also regulates land development in FEMA flood areas.	Adopted 1980.	None found
Fire Mutual Aid	Assistance from county fire, rescue, municipal and public works departments.	Grand Isle County Mutual Aid Agreement, 2006.	Does not include ambulance rates.
School Emergency Response	Responses by various types of emergency incidents at school.	Vermont School Crisis Guide.	Needs updating.

Through current plans, policies and mitigation actions, Isle La Motte is working to decrease damages from severe winter storms (ice storms), floods and structure fires. Other less hazardous risks are also being addressed.

<u>Flooding and Development Regulations</u>

The Town of Isle La Motte has adopted a floodplain ordinance in order to protect the health, safety, and welfare of its residents and to allow the community to participate in the National Flood Insurance Program (NFIP). In 1980, the Town established an ordinance for special flood hazard areas. The purpose of this bylaw is:

- Minimize and prevent the loss of life and property, the disruption of commerce, the impairment of the tax base, and the extraordinary public expenditures and demands on public services that result from flooding and other flood related hazards; and
- Ensure that the design and construction of development in flood and other hazard areas are accomplished in a manner that minimizes or eliminates the potential for flood and loss or damage to life and property; and
- Manage all flood hazard areas designated pursuant to 10 V.S.A. § 753; and
- Make the state, municipalities, and individuals eligible for federal flood insurance and other federal disaster recovery and hazard mitigation funds as may be available.

The Town floodplain manager is responsible for monitoring compliance with the NFIP.

8. PLAN IMPLEMENTATION, MONITORING & EVALUATION

Monitoring and Updating the Plan – Yearly Review

Once the plan is approved and adopted, the Selectboard in Isle La Motte, along with interested and appointed volunteers and stakeholders, will continue to work with staff at the Northwest Regional Commission to monitor, evaluate, and update the plan throughout the next 5-year cycle. The plan will be reviewed annually at the May Selectboard meeting along with the review of the town's Local Emergency Operations Plan (LEOP), once it is created. During the annual review, the Selectboard will evaluate the plan effectiveness at achieving its stated purpose and goals. This meeting will allow town officials and the public to discuss the town's progress in implementing mitigation actions and determine if the town is interested in applying for grant funding for projects that can help mitigate future hazardous events; e.g., bridge and culvert replacements, road replacements and grading, as well as buying out any repetitive loss structures that may be in the Special Flood Hazard Area, and revise the plan as needed. Northwest Regional Commission's staff will assist the Isle La Motte Selectboard with this review, as requested by the Town. Progress on actions will be kept track using a table the NRPC will provide to the Selectboard to update. There will be no changes to the plan, unless deemed necessary by the Town. If so, the post disaster review procedure will be followed.

Plan Maintenance (5 Year Update and Evaluation Process)

The Hazard Mitigation Plan is dynamic and should not be static. To ensure that the plan remains current and relevant, it is important that it be updated periodically. The plan should be updated every five years in accordance with the following procedure:

1. The Isle La Motte Selectboard will appoint a team to convene a meeting of the hazard mitigation planning committee. The team will include a Isle La Motte Emergency Management Director who will chair the meeting. Others members should include local officials such as Selectboard members, Fire Chief, Floodplain Manager, Road Commissioner, Health Officer and interested stakeholders. The Emergency Management Director will work with the Northwest Regional Planning Commission staff and be the point person for the Town.

2. The NRPC staff will guide the Committee through the update process. This update process will include several publicly warned meetings. At these meetings, the Committee will use the existing plan and update as appropriately guided by the NRPC staff to address:
    a. Update of hazard events and data gathered since the last plan update.
    b. Changes in community and government processes, which are hazard-related and have occurred since the last review
    c. Changes in community growth and development trends and their effect on vulnerability.
    d. Progress in implementation of plan initiatives and projects
    e. Incorporation of new mitigation initiatives and projects.
    f. Effectiveness of previously implemented initiatives and projects.
    g. Evaluation of the plan for its effectiveness at achieving its state purpose and goals.
    h. Evaluation of unanticipated challenges or opportunities that may have occurred between the date of adoption and the date of the report, and their effect on capabilities of the town.
    i. Evaluation of hazard-related public policies, initiatives and projects.
    j. How mitigation strategy has been incorporated into other planning mechanisms.

k. Review and discussion of the effectiveness of public and private sector coordination and cooperation.

3. From the information gathered at these meetings, along with data collected independently during research for the update, the NRPC staff will prepare and update a draft in conformance with the FEMA *Local Hazard Mitigation Plan Review Tool* document.

4. The Selectboard will review the draft report. Consensus reached on changes to the draft. Emphasis in plan updates will be put on critically looking at how the plan can become more effective at achieving its stated purpose and goals.

5. The changes will be incorporated into the Plan by NRPC staff.

6. The Selectboard will notify the public that the draft is available for public comment and review. The Town will advertise and make available the draft plan for comments both electronically and in hard copy. The draft plan will be distributed electronically to neighboring municipalities.

7. Public comments will be incorporated by NRPC staff. The final draft will be provided to the plan development participants and town staff for final review and comment with review comments provided to the Emergency Management Director and incorporated into the plan.

8. The NRPC staff will finalize the plan, with any remaining comments from the plan participants and town staff incorporated, and then submitted electronically to DEMHS State Hazard Mitigation Officer (SHMO) who will then submit to FEMA Region 1.

9. The Plan will be reviewed by the DEMHS SHMO and FEMA Region 1.

10. SHMO and FEMA comments will be addressed in the Plan by NRPC staff.

11. The Plan will be resubmitted as needed until the plan is approved pending adoption by FEMA Region 1. Once the plan is approved by FEMA, it will be ready for adoption.

12. The Selectboard will adopt the plan and distribute to interested parties.

13. The final adopted plan will be submitted by NRPC staff to DEMHS and FEMA.

14. FEMA will issue final approval of the adopted plan.

<u>Continued Public Involvement</u>

The Isle La Motte Selectboard is dedicated to involving the public directly in the continual review and updates of the Hazard Mitigation Plan. Copies of the plan will be kept at the Town Office. The existence and location of these copies will be publicized in the media (newspaper, web sites, Town Annual Report, etc.) In addition, any proposed changes will be publicized in the media.

<u>Programs, Initiatives and Projects Review</u>

Although the plan should be reviewed in its entirety every five years as described above, the Town may review and update its programs, initiatives and projects more often directly with the State Hazard Mitigation Officer (SHMO) based on changing local needs and priorities.

The Town of Isle La Motte should incorporate elements of this plan, such as identified projects, into capital planning initiatives and annual budget reviews during Town Meeting.

Post-Disaster Review/Update Procedure

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

1. Within six months of a declared emergency event, the town will initiate a post disaster review and assessment. Members of the State Hazard Mitigation Committee will be notified that the assessment process has commenced.

2. This post disaster review and assessment will document the facts of the event and assess whether existing Hazard Mitigation projects effectively lowered community vulnerability/damages. New mitigation projects will be discussed, as needed.

3. A draft After Action Report of the review and assessment will be distributed to the hazard mitigation committee.

4. A meeting of the committee will be convened by the Selectboard to make a determination of whether the plan needs to be amended. If the committee determines that NO modification of the plan is needed, then the report is distributed to local communities.

5. If the committee determines that modification of the plan IS needed, then the committee drafts an amended plan based on the recommendations and forwards to the Selectboard for public input.

6. The Selectboard adopts the amended plan after receiving approval-pending-adoption notification from FEMA.

Attachment A

Critical Facilities, Hazmat Storage Facilities, and Vulnerable Sites
Town of Isle La Motte

Facility Name or Facility Designation	Facility Owner	Function	Street or Location
U.S. Post Office	US Postal Service	Critical Facility - Government	School Street
Isle La Motte Town Office	Town of Isle La Motte	Critical Facility - Government	Main Street
Isle La Motte Elementary School - Closed	Town of Isle La Motte / Supervisory Union	Critical Facility – Former shelter.	School Street
Isle La Motte Fire Department	Town of Isle La Motte	Critical Facility/ Hazmat Storage Facility	Main Street
St. Anne's Shrine	Roman Catholic Diocese of Burlington	Vulnerable Site – Place of worship. Public gathering site.	Shrine Road
Isle La Motte Country Store		Hazmat Storage Facility	School Street
Route 129 Causeway	State of Vermont	Vulnerable Site – Only land route off island.	Route 129 between Isle La Motte-Alburgh

Attachment B

Town of Isle La Motte Priority Matrix

Criteria score: "1" (indicating Poor), "2" (indicating Average) and "3" (indicating Good).

		Criteria											Total Score
		1	2	3	4	5	6	7	8	9	10	11	
Mitigation Action	Bank Stabilization along West Shore Road (16 sites)	3	3	3	3	3	3	3	3	3	3	3	**33**
	Drainage improvements West Shore Road (north of School St intersection)	3	3	3	3	3	3	3	3	3	3	3	**33**
	Drainage improvements West Shore Road (800 feet north of Fisk Point Road intersection)	3	3	3	3	3	3	3	3	3	3	3	**33**
	Bank Stabilization along East Shore Road (14 sites)	3	3	3	3	3	3	3	3	3	3	3	**33**
	Drainage improvements East Shore Road (0.5 mile north of Nobles Hill Road intersection)	3	3	3	3	3	3	3	3	3	3	3	**33**
	Generator at Elementary School	2	3	2	3	2	3	3	3	3	3	3	**30**
	Incident Command Systems Training	1	3	3	1	3	3	3	3	3	3	3	**29**
	Generator at Fire Station	3	3	3	1	1	2	3	2	3	3	2	**26**
	Support Power Utility Efforts to Protect Utility Corridors (tree / branch removal												

1. Does the action reduce damage?
2. Does the action contribute to community objectives?
3. Does the action meet existing regulations?
4. Does the action protect historic structures or structures critical to Town operations?
5. Can the action be implemented quickly?
6. Is the action socially acceptable?
7. Is the action technically feasible?
8. Is the action administratively possible?
9. Is the action politically acceptable?
10. Is the action legal?
11. Does the action offer reasonable benefits compared to its cost of implementation?
12. Is the action environmentally sound?

Attachment C

Public Government Participation

Information in the Hazard Mitigation Plan is based on research from a variety of sources. It encompassed research using a historical perspective and future projections for the vulnerability assessment. The research methods and various contributions to the plan included but were not limited to:

- Town of Isle La Motte Select Board
- Northwest Regional Planning Commission
- Grand Isle County Mutual Aid Association
- Grand Isle County Sheriff's Department
- Vermont Agency of Natural Resources
- Vermont Department of Transportation District 8
- Vermont Emergency Management
- Vermont Fire Academy
- Northeast States Emergency Consortium
- Federal Emergency Management Agency
- National Oceanic Atmospheric Administration
- Vermont Geological Survey

Attachment D

Town of Isle La Motte Base Map

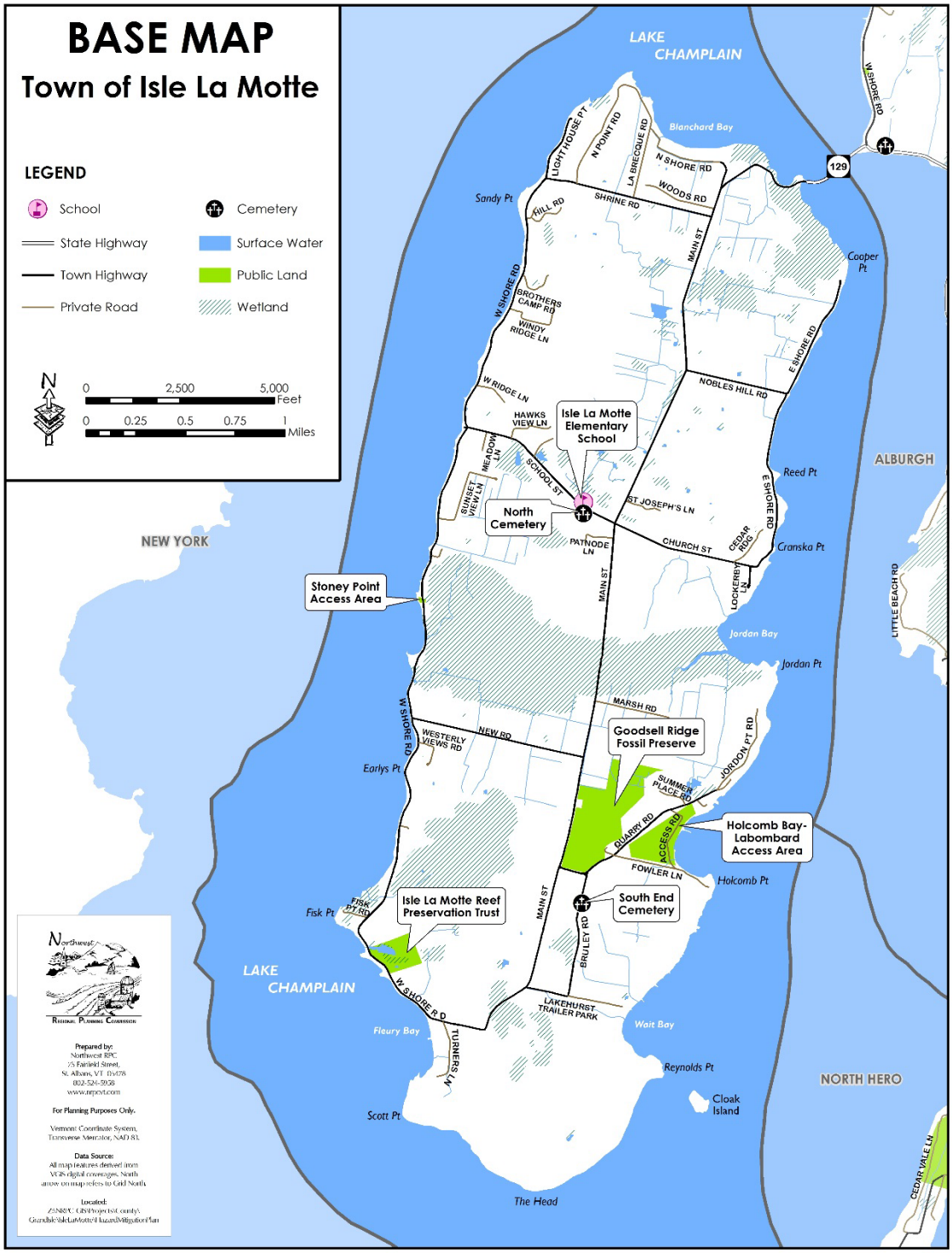


Figure 6 - Base Map

Attachment E

Isle La Motte Critical Areas Map

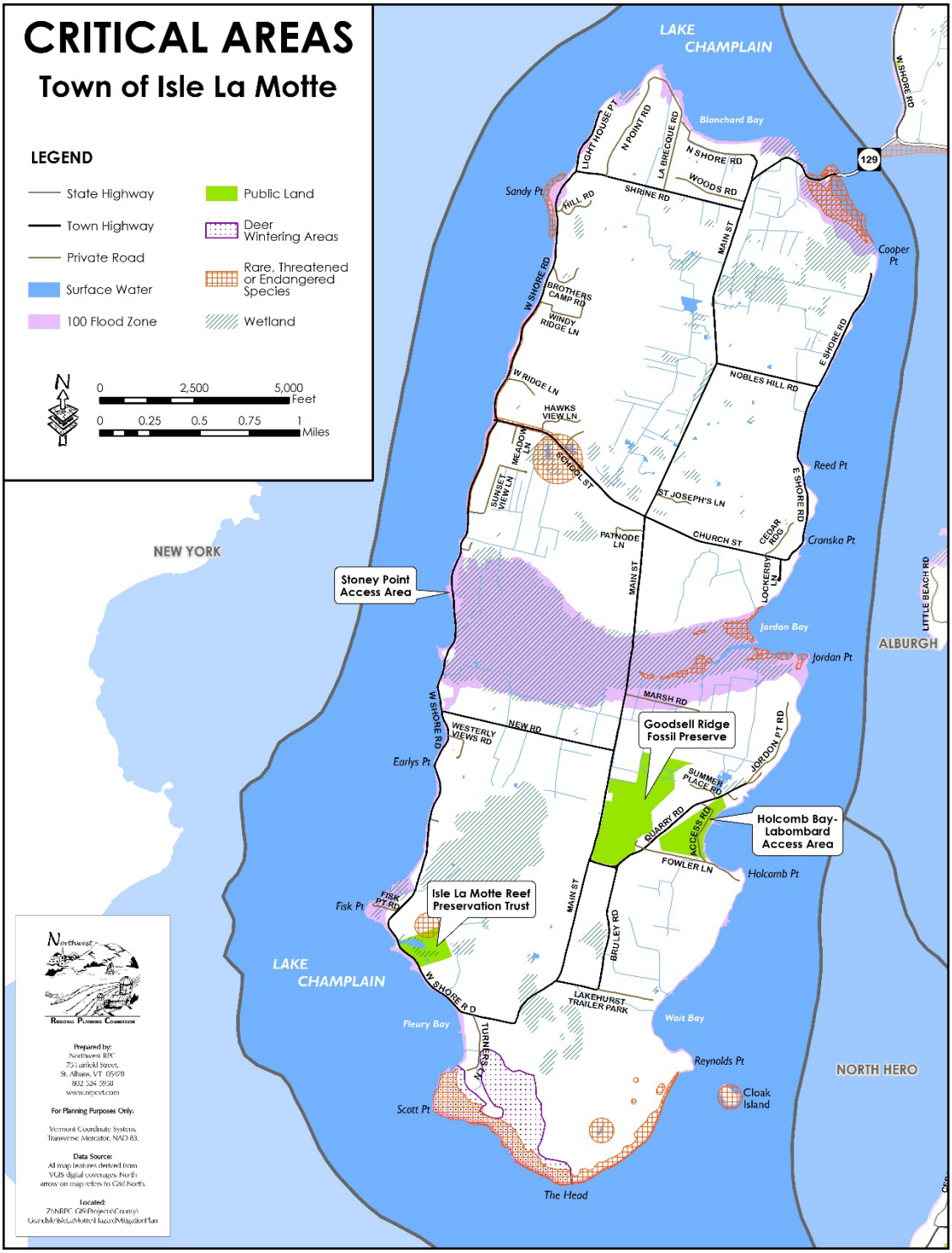


Figure 7 - Critical Areas

Attachment F
Isle La Motte Relief Map

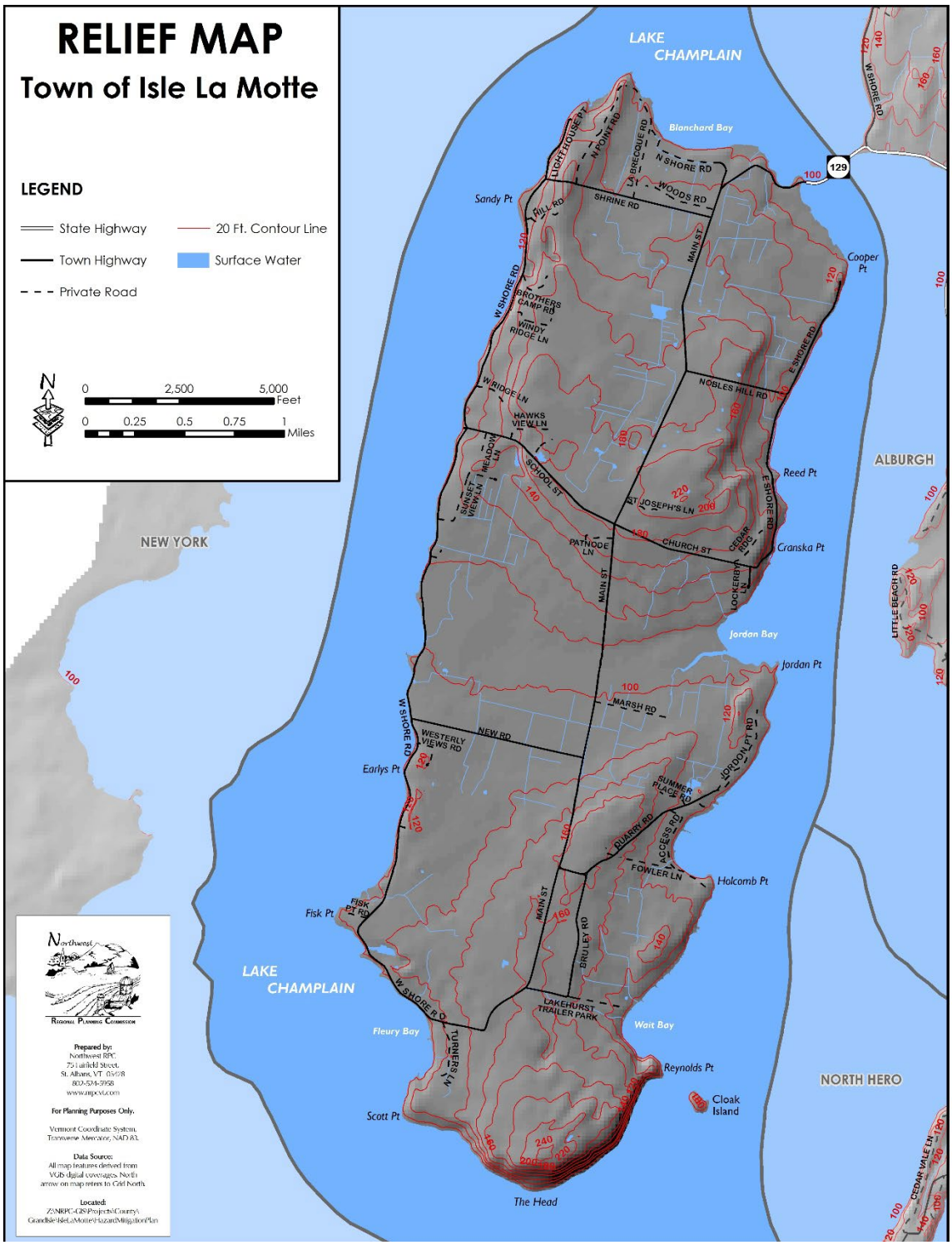


Figure 8 - Relief Map

Attachment G
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