

# KENNEBEC COUNTY HAZARD MITIGATION PLAN

## 2021 UPDATE



Searles Mill Road Chelsea, culvert washout, April 2007 KCEMA Photo

**Kennebec County Emergency Management Agency**  
77 Winthrop St  
Augusta, Maine 04330

# TABLE OF CONTENTS



Section 1 – Introduction	3
Section 2 – Plan Adoption	7
Section 3 – Planning Process	9
Section 4 – Risk Assessment	18
Section 5 – Mitigation Strategy	75
Section 6 – Plan Maintenance	106
Kennebec County Mitigation Maps	112
Kennebec County Extremely Hazardous Substance Sites	143
Miscellaneous Maps	144
Appendix	
A - Town Responses	148
B- 2020 Survey Results	179

## **SECTION 1 INTRODUCTION**

Understanding that the Local Mitigation Plan requirements in 44 CFR §201.6 of the Interim Final Rule applies to local jurisdictions, the County of Kennebec, State of Maine decided to complete a multi-jurisdictional mitigation plan to include and incorporate each of its member municipalities. This is due to the fact that the majority of these communities are too small to complete such an undertaking on their own. This county-wide mitigation planning effort encouraged agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broader public participation enabled the development of mitigation measures that are supported by these various stakeholders and reflects the need of the county-wide community.

The Kennebec County Hazard Mitigation Plan includes the following sections:

- Prerequisites
- Planning Process
- Risk Assessment
- Mitigation Strategy
- Plan Maintenance Procedures

### **Setting**

Kennebec County, located in Central Maine, in the State of Maine, displays the scenic beauty of the lush Maine forests and farmlands of the inland hills, yielding harvests both cultivated and wild.

The major water body in Kennebec County is the Kennebec River which rises from the headwaters of Moosehead Lake in Piscataquis County and flows south approximately 145 miles through five counties before joining the Androscoggin River in Merrymeeting Bay and emptying into the Atlantic Ocean. The Kennebec River Basin occupies approximately 5,900 square miles of southwestern Maine. The upper two thirds of the basin above Waterville are hilly and mountainous and the lower third has a more gentle topography. The river passes through 13 Kennebec County communities and has periodically caused major flooding in the southern communities of Augusta, Hallowell and Gardiner. Other communities along the river typically do not see the same type of flooding.

In recent years, ice jams have occurred more frequently in the Kennebec between Augusta and Gardiner. In January of 2018, heavy rains and a sudden drop in temperature caused a large ice jam formed in Augusta and broke free to be reformed in Hallowell. The sudden and large ice jam caused flooding in downtown Hallowell and resulted in damaged businesses and property.

### **Size**

The County consists of 123,642\* residents living in 62,020\* housing units. The County contains 951.18 square miles, 91.2% land surface (867.58 square miles) and 8.8% water. This results in a population density of 141 people per square mile. There are no U.S. Census designated

Metropolitan areas in the County. (\*Projected data based on 2020 Census)

## **County Government**

The County government contains the County Sheriff's Department and County Jail, County Clerk's Office, County Treasurer's Office, Registrar of Deeds, Probate Judge, Assistant District Attorney, and the Emergency Management Office. The municipalities are responsible for Tax Collection, Clerk's Office, Road Maintenance and Snow Removal, Refuse Collection, Land Use Planning, Code Enforcement, Animal Control, Fire Protection, and Cemetery Maintenance

## **Local Government**

There are twenty-five incorporated towns, one unorganized township and four incorporated cities; one which is the "shiretown" or county seat of Augusta. The following is a description of the different types of government and authorities in Kennebec County, based in part on the Maine Municipal Association's report "Local Government in Maine."

**Cities.** All cities in Maine have local charters granted by the Maine Legislature that provide for a representative form of government - meaning they have a city council that serves as the legislative body. The city council is elected by and answerable to the citizens. The office of mayor varies considerably from city to city, with only a few acting as chief executive officer. Some mayors are elected by the vote of the people, while others are elected by a vote of their fellow councilors. Kennebec County's cities include Augusta, Waterville, Gardiner and Hallowell. Cities are not defined by population. In fact, the City of Hallowell has a 2020 projected population of 2,381 (less than 1% increase from 2010), about the size of a large town. In general, city councils have the authority to enact ordinances.

**Towns.** Towns remain the cornerstone of local government. A Maine community becomes a town when it is incorporated by a special act of the legislature. At that time, it is given certain privileges and responsibilities. Under Home Rule, towns may take any action or change their form of government in any way not denied or precluded by state or federal law. The voters of the town constitute its legislative body. Day-to-day governance of towns has expanded from the original board of selectmen to include town managers, town councils, budget committees, municipal departments and various professional managers. In a small number of mostly larger towns, the council exerts legislative control without a town meeting. In others, a ballot vote is used to approve the budget rather than the open town meeting.

**Townships/Unorganized territory.** Maine is unique among eastern states in having half its land mass, or more than 10 million acres, in an Unorganized Territory. Most of it is in the northern and easternmost counties. There is no local, incorporated municipal government. Collectively, the Unorganized Territory has a population of 9,000 residents, which is 0.68 percent of the State's population.

Provision of services and property tax administration for the Unorganized Territory is shared among various State and County agencies. Law enforcement and public road maintenance is the County's responsibility. Taxes are paid to the State Property Tax Division. The State's Land Use Planning Commission (LUPC) establishes basic rules. Services are provided by the State,

## Kennebec County Hazard Mitigation Plan – 2021 Update

by counties and by contract with nearby municipalities and school districts. Unity Township is the only township in Kennebec County's portion of the Unorganized Territory. In the year 2020, it is estimated that there will be 41 people living in Unity Township.

### Major Employers

Four of the largest employers in the County are the State of Maine government, Maine General Medical Center, Hannaford Brothers, and Colby College of Waterville (<https://www.maine.gov/labor/cwri/publications/pdf/MaineCountyTop25Employers.pdf>).

### Household Income

According to the American Community Survey five year estimates, median household income in Kennebec County during the period 2016-2019 (\$52,922) was slightly less than that for Maine as a whole (\$55,970).

### Population

After the completion of the 2020 Census, the population is projected to raise less than 1% to a projected total of 123,642. As shown in the table below, the County's population grew by 5% from 1980 to 1990, only 1% from 1990 to 2000, and 4% from 2000 to 2010.

<b>Population of Kennebec County and Maine 1930-2020</b>		
<b>Year</b>	<b>Kennebec County</b>	<b>Maine</b>
1930	70,691	797,423
1940	77,231	847,226
1950	83,881	914,950
1960	89,150	970,689
1970	95,247	992,048
1980	109,889	1,124,660
1990	115,904	1,227,928
2000	117,114	1,274,923
2010	122,151	1,328,361
2020*	123,642	1,350,141
1970-80 change	15%	13%
1980-90 change	5%	9%
1990-00 change	1%	4%
2000-10 change	4%	4%
2010-20 change*	>1%	1.6%

Source: U.S. Census \*projected

The table on the next page, which is based on the projected estimates for the 2020 Census, shows that Kennebec County is composed of relatively small communities when compared to

## Kennebec County Hazard Mitigation Plan – 2021 Update

the rest of the country. Even the cities of Augusta, Waterville, Gardiner and Hallowell are quite small compared to national standards. Most Kennebec County towns do not have departments or staff resources that may be commonplace in larger communities like Portland or Boston. Very few Kennebec County municipalities have municipal planning staff or community development personnel. Kennebec County EMA is not aware of any community with fulltime GIS or hazard mitigation personnel.

<b>Municipal Population 2020*</b>						
<b>Town/City</b>	<b>Year Round Population</b>	<b>Median Age</b>	<b>Total Housing Units</b>	<b>Year Round Housing Units</b>	<b>Seasonal Housing units</b>	<b>Average Household Size</b>
Albion	2,118	40.7	917	838	79	2.65
Augusta	18,747	43.8	10,134	9,040	1,094	1.96
Belgrade	3,150	46.4	2,126	1,232	894	2.54
Benton	2,716	46.0	1,175	1,072	103	2.53
Chelsea	2,749	48.3	1,040	1,004	36	2.51
China	4,331	42.1	2,409	1,781	628	2.97
Clinton	3,368	47.4	1,750	1,471	279	2.29
Farmingdale	2,924	40.0	1,243	1,101	142	2.05
Fayette	1,171	51.2	816	480	336	2.25
Gardiner	5,674	40.4	2,631	2,401	230	2.31
Hallowell	2,384	37.2	1,279	1,104	175	2.10
Litchfield	3,678	48.8	1,977	1,521	456	2.37
Manchester	2,556	46.8	1,218	1,069	149	2.37
Monmouth	4,167	47.5	1,716	1,214	478	2.70
Mount Vernon	1,704	47.9	1,112	623	489	2.35
Oakland	6,336	49.7	3,303	2,692	611	2.33
Pittston	2,800	44.4	1,312	1,103	209	2.42
Randolph	1,711	44.2	968	858	110	2.24
Readfield	2,584	46.5	1,285	1,010	275	2.48
Rome	1,010	45.0	1,012	407	605	2.41
Sidney	4,527	39.6	1,944	1,655	289	2.62
Unity Township	41	39.5	19	19	0	2.53
Vassalboro	4,414	44.9	2,163	1,866	297	2.33
Vienna	577	47.4	411	207	204	2.33
Waterville	16,580	39.7	7,688	6,953	735	2.08
Wayne	1,160	50.2	803	473	330	2.33
West Gardiner	3,376	40.2	1,446	1,222	224	2.77
Windsor	2,617	43.5	1,166	1,052	114	2.46
Winslow	7,648	43.7	3,572	3,227	345	2.35
Winthrop	6,023	51.0	3,385	2,652	733	2.21
<b>TOTAL</b>	<b>123,642</b>	<b>44.8</b>	<b>62,020</b>	<b>51,347</b>	<b>10,649</b>	<b>2.39</b>

(\*Census data is projected as 2020 Data has not been fully released)

Introduction – 2021 Update

## SECTION 2 PLAN ADOPTION

### PLAN ADOPTION

**Requirement: §201.6(c)(5):** (The plan must include) documentation that the plan has been adopted by the governing body of the jurisdiction requesting approval (e.g. City Council, County Commissioner, Tribal Council). For multi-jurisdiction plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The Kennebec County Hazard Mitigation Plan is a multi-jurisdictional plan and has been prepared by a Hazard Mitigation Planning Team hosted by the Kennebec County Emergency Management Agency with representatives from the county and municipal governments. The Planning Team also met or spoke with state officials, local regional planning commission and other officials of each of the 29 municipalities to collect their comments and recommendations on the identification of hazards, assessment of vulnerabilities and risks, and the determination of mitigation goals and measures.

Municipalities that participated in the preparation of this plan include the following (Kennebec County participated on behalf of its portion of the Unorganized Territory):

Albion  
Augusta  
Belgrade  
Benton  
Chelsea  
China  
Clinton  
Farmingdale  
Fayette  
Gardiner  
Hallowell  
Litchfield  
Manchester  
Monmouth  
Mount Vernon  
Oakland  
Pittston  
Randolph  
Readfield  
Rome  
Sidney  
Unorganized Territory  
Vassalboro  
Vienna  
Waterville  
Wayne

## Kennebec County Hazard Mitigation Plan – 2021 Update

West Gardiner  
Windsor  
Winslow  
Winthrop

Copies of the adoption resolutions are on the following pages.



### SECTION 3 PLANNING PROCESS

<b>Planning Process</b>	
<b>Requirement §201.6(b)(1):</b> (The planning process shall include) an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.	
Element	A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? A3. Does the plan document how the public was involved in the planning process during the drafting stage?

Throughout this Plan, the terms “community” and “jurisdiction” are used interchangeably. Either word is understood to include participating municipalities or Unorganized Territory.

The Kennebec County Hazard Mitigation Plan - 2021 Update was a multi-jurisdictional collaborative effort. The Hazard Mitigation Planning Team sought participation through town mailings, surveys, meetings, field visits to potential project sites, postings on the Kennebec County EMA website, emails, social media, and phone calls.

Participants at various meetings discussed county wide and town specific hazards and the probability and vulnerability of certain hazards. Groups also reviewed mitigation projects from the 2016 plan, new projects that have been added for the 2021 update and discussed any additional projects that were not already identified.

Additional participation was solicited through phone and email correspondence and the Public Review and Comment session for any recommendations/comments.

The Planning Team provided expertise, data, and assistance in updating the plan. The Hazard Mitigation Planning Team consisted of the following:

<b>Kennebec County Planning Team</b>	
Sean Goodwin	Director, Kennebec County Emergency Management Agency
Art True	Deputy Director, Kennebec County EMA
Jason Decker	Operations, Kennebec County EMA
Theodore Marshall	Planner, Kennebec County EMA
Samuel Roy	Maine Emergency Management Agency (MEMA)

The jurisdictions in Kennebec County contributed to the preparation of this Plan in a variety of ways. While meeting attendance provides a solid measure of local interest and support, not all local officials have the time and resources to attend them. Meeting participation is also hampered by the fact that many local officials have full-time jobs in addition to their municipal responsibilities. Concurrently, restrictions on indoor gatherings from the COVID-19 Pandemic limited the county and local communities’ ability to hold regular in-person meetings. However, participation in the preparation of this Plan has been construed to include many venues

## Kennebec County Hazard Mitigation Plan - 2021 Update

including:

- Return of Kennebec County Mitigation Planning Municipal Survey (this survey was sent out in the fall of 2020 by the Kennebec County Emergency Management Agency);
- Participation in flooding/ice jam meetings for municipalities along the Kennebec that are vulnerable to flooding or ice jam damages;
- Individual Meetings – Kennebec County EMA and officials from specific jurisdictions;
- Attendance at Kennebec County EMA meetings at which the Plan was discussed; Submittal of information for projects included in Plan.

Summary

### Hazard Mitigation Outreach Efforts

**Hazard Mitigation Survey.** In the fall of 2020, Kennebec County EMA distributed a survey to its communities, asking about specific areas subject to flooding, winter and summer storms, and wildfire as well as “other” concerns they might have. In addition, the survey was also published on the social media account for the county to allow the general public to participate as well. Three engaged citizens (EC) participated in the survey as marked below. The following communities responded to the survey:

Albion	Readfield
Benton (EC)	Sidney (EC)
China	Vassalboro
Gardiner	Waterville
Monmouth	West Gardiner
Oakland (EC)	Winthrop

The responses from the survey were used in section four. The responses from the survey were used for individual municipalities to articulate the hazards that they face.

**Kick-Off Meeting.** Members of the Kennebec County Planning Team met in the fall of 2019 to discuss the plan. It was determined that the plan only needed some minor changes to update the plan. Using the feedback received from FEMA during the 2017 Mitigation Plan final review, efforts were focused in improving those areas noted. It was also determined that these changes could be done in house and no outside firm would be needed.

**EMA/Municipal Meetings.** Due to the COVID -19 Pandemic, it was very difficult to schedule or plan meetings with municipalities. Kennebec County reached out as needed to specific communities when specific information was needed. To communicate with the municipalities, the planning team would reach out the local Emergency Managers either via email or phone for them to provide the information needed. The local Emergency Managers served as liaisons between the planning team and the municipalities when able. If the information was not available, the Emergency Manager would provide a contact with-in the municipality who would have the most appropriate knowledge. These contacts would be, but not limited to, Town/City

## Kennebec County Hazard Mitigation Plan - 2021 Update

Managers, Selectman, Council members, public works directors, road commissioners, etc. In the event the Emergency Manger was not available, the planning team would contact the Town/City Managers to determine who the best point of contact would be. On multiple occasions the planning team offered to participate in municipality meetings to present the plan and offer more information. None of the municipalities requested Kennebec attendance and none of the members of the municipalities reached out for questions.

**Public Comment and Review Session** On January 21<sup>st</sup>, the Kennebec County Planning team published two versions of the mitigation plan; a version of the plan with all changes visible and a version of the plan with the changes hidden for easier reading. The plan was sent to the municipalities of Kennebec County for review and comment. Both versions were also placed on the Kennebec County EMA website for the general public to view as well. A link was placed on the Kennebec County EMAs Facebook page to hopefully garner interest. The public and municipal comment period started on the 21<sup>st</sup> of January and ended on the 4<sup>th</sup> of February. The Planning team received no comment from the general public and the towns of Oakland, West Gardiner, and China requested minor errors to be fixed within the plan.

The planning team gave the municipalities multiple opportunities after the public review phase to review and provide input to the plan. As stated in the EMA/Municipal Meeting section, the county continued to reach out to the to the Emergency Managers and Municipal officials via email and phone calls to encourage participation within the community. Many municipalities were happy to provide updated mitigation projects listed in section five but did not feel the need to offer any further input other than what was provided in the surveys.

Kennebec County Hazard Mitigation Plan - 2021 Update

**Status of Local Participation**

The following table documents how each jurisdiction participated in the preparation of this Plan.

<b>Summary of Local Participation</b>						
"X" indicates participation						
"RC" indicates Road Commissioner						
"DPW" indicates Department of Public Works						
<b>Jurisdiction</b>	<b>Return of 2020 Survey</b>	<b>Phone Calls</b>	<b>Individual Meetings</b>	<b>EMA Meetings</b>	<b>Projects in Plan</b>	<b>Emails re: Plan Update</b>
Albion	X	X			RC	X
Augusta		X			DPW	X
Belgrade		X	X		RC	X
Benton	X	X			RC	X
Chelsea		X		X	RC	X
China	X	X			RC	X
Clinton		X			RC	X
Farmingdale		X			RC	X
Fayette		X			RC	X
Gardiner	X	X	X	X	DPW	X
Hallowell		X	X	X	RC	X
Litchfield		X			RC	X
Manchester		X		X	RC	X
Monmouth	X	X			RC	X
Mount Vernon		X			RC	X
Oakland	X	X			RC	X
Pittston		X			RC	X
Randolph		X			RC	X
Readfield	X	X	X		RC	X
Rome		X			RC	X
Sidney	X	X			RC	X
UT (Unity Twp)		X			RC	X
Vassalboro	X	X			RC	X
Vienna		X			RC	X
Waterville	X	X			RC	X
Wayne		X			RC	X
West Gardiner	X	X		X	RC	X
Windsor		X	X		RC	X
Winslow		X			RC	X
Winthrop	X	X	X		RC	X

The following table identifies all jurisdictions that participated in the preparation of the 2005 Plan, the 2011 Plan, and the 2016 Plan.

Kennebec County Hazard Mitigation Plan - 2021 Update

<b>Summary of Participating Municipalities</b> "X" indicates participation; "-" indicates non-participation				
<b>Jurisdiction</b>	<b>2005 Plan</b>	<b>2011 Plan</b>	<b>2016 Plan</b>	<b>2021 Plan</b>
Albion	X	X	X	X
Augusta	X	X	X	X
Belgrade	X	X	X	X
Benton	X	X	X	X
Chelsea	X	X	X	X
China	X	X	X	X
Clinton	X	X	X	X
Farmingdale	X	X	X	X
Fayette	X	X	X	X
Gardiner	X	X	X	X
Hallowell	X	X	X	X
Litchfield	X	X	X	X
Manchester	X	X	X	X
Monmouth	X	X	X	X
Mount Vernon	X	X	X	X
Oakland	X	X	X	X
Pittston	X	X	X	X
Randolph	X	X	X	X
Readfield	X	X	X	X
Rome	X	X	X	X
Sidney	X	X	X	X
UT (Unity Township)	X	X	X	X
Vassalboro	X	X	X	X
Vienna	X	X	X	X
Waterville	X	X	X	X
Wayne	X	X	X	X
West Gardiner	X	X	X	X
Windsor	X	X	X	X
Winslow	X	X	X	X
Winthrop	X	X	X	X

The following table includes a list of the local Emergency Managers who were used as contacts during planning and review process. The local Emergency Managers also acted as liaisons to the municipalities.

**Kennebec County Local Emergency Managers**

Albion	Andrew Clark	Fire Chief
Augusta	David Groder	Fire Chief

Kennebec County Hazard Mitigation Plan - 2021 Update

Belgrade	Jeremy Damren	Town Emergency Manager (EM)
Chelsea	Shawn Ramage	Fire Chief
China	Rebecca Hapgood	Town Manager
Clinton	Travis Cousins	Town EM
Farmingdale	Dana Mealey	Fire Chief
Fayette	Martin Maxwell	Fire Chief
Gardiner	Rick Sieberg	Fire Chief
Hallowell	James Owens	Fire Chief
Litchfield	Bruce Slattery	Town EM
Manchester	Frank Wozniak	Fire Chief
Monmouth	Dan Roy	Fire Chief
Mount Vernon	Vacant	Selectmen interim
Oakland	David Coughlin	Fire Chief
Pittston	Josh Johnson	Fire Chief
Randolph	Ron Cunningham	Fire Chief
Readfield	Lee Mank	Fire Chief
Rome	Ed Pearl	Town EM
Sidney	Richard Jandreau	Fire Chief
Unity Township	Scott Ferguson	County Administrator
Vassalboro	Walker Thompson	Fire Chief
Vienna	Brian Church	Fire Chief
Waterville	Shawn Esler	Fire Chief
Wayne	Taylor Stevenson	Fire Chief
West Gardiner	Debra Couture	Town EM
Windsor	Arthur Strout	Fire Chief
Winslow	Ron Rodriguez	Fire Chief
Winthrop	Dan Brooks	Fire Chief

<b>Opportunity for Neighboring Communities, Regional Agencies</b>	
<b>Requirement §201.6(b)(2):</b> (The planning process shall include) an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process.	
Element	A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process?

## Kennebec County Hazard Mitigation Plan - 2021 Update

Since this is a multi-jurisdictional plan, all public meetings were with neighboring communities, either adjacent to each other or within the County. Refer to the Summary of Participating Agencies as referenced below. Opportunities for local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process were given in the form of town mailings, the Kennebec County EMA website, emails and phone calls. Many of the local officials involved in the 2021 update of the plan work in various agencies, businesses, academia and nonprofit organizations.

### Summary of Participating Agencies

<b>Agency</b>	<b>Contribution</b>
The National Weather Service	Gray Forecasting Office reviewed the hazard profiles and provided additional insight into the flooding hazard profile
NOAA National Centers for Environmental Information	Reviewed Storm Events Database to update historic weather events of note from the past 5 years
Department of Homeland Security	Homeland Infrastructure Foundation-Level Data used to identify the distribution of critical facilities in municipal risk assessment maps. <a href="https://hifld-geoplatform.opendata.arcgis.com/">https://hifld-geoplatform.opendata.arcgis.com/</a>
Northeast States Emergency Consortium (NESEC)	Consulted on extreme natural hazard events and developed reports of Hazus model disaster data. <a href="http://nsec.org/">http://nsec.org/</a>
Maine Emergency Management Agency (MEMA)	<p>Provided needed planning assistance, information and data, and clarifications on process and Hazard Mitigation Plan needs. They were consulted for input on areas prone to each hazard profiled and possible mitigation at the local and county level.</p> <p>Dam Safety Program assisted with the assessment of dam failure risk and record of incidents and failures.</p> <p>Consulted on information from 2020 Maine Hurricane Evacuation Study</p>
University of Maine and the Maine Climate Council Scientific and Technical Subcommittee	Provided data to inform the risk assessment.
Maine Forest Service	Regional Forest Ranger provided information for the Wildfire hazard profile

## Kennebec County Hazard Mitigation Plan - 2021 Update

Maine Department of Agriculture, Conservation & Forestry's National Flood Insurance Program Coordinator	Provided repetitive loss property information, guidance on best-available Flood Insurance Rate Map data, and further data and guidance.
Maine Office of GIS Senior Program Analyst	Spatial information for critical facilities and infrastructure for municipal risk assessment maps. <a href="https://www.maine.gov/geolib/catalog.html">https://www.maine.gov/geolib/catalog.html</a>
Office of the State Economist	Provided needed data and guidance on data collection and future state, county, and municipal population projections to assess potential development trends. <a href="https://www.maine.gov/dafs/economist/home">https://www.maine.gov/dafs/economist/home</a>
Kennebec County EMA and local EMA directors	Consulted for their input on areas prone to each hazard profiled and possible mitigation actions to be taken at both the county and local level.
Town select boards	Attended County EMA meetings on the plan update and assigned other town officials to participate in the plan development.
Local fire chiefs and their departments, code enforcement officers, and town managers	Provided the necessary information on needed mitigation actions such as costs, timelines, and priority, updates on previously identified projects, and local knowledge on areas susceptible to natural disasters.

The Kennebec Valley Council of Governments (KVCOG) is a municipal services corporation owned and operated by and for the benefit of its members. KVCOG's region includes Kennebec, Somerset and western Waldo counties with a population over 180,000. KVCOG is one of seven federally designated Economic Development Districts in Maine and a State designated Regional Planning and Development District. Services include Community Planning, Joint Purchasing, GIS & Mapping, Economic & Community Development, Environmental Planning, Grant Opportunities, and local business services. During the Review of the plan, the planning team worked directly with members of the KVCOG that also municipal employees within Kennebec County. While this iteration of the plan does not have a focus on community development, Kennebec County EMA will be looking to create a better working relationship with the KVCOG to provide more resources to guide the development of safer municipalities in Kennebec County.

Element	A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information?
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This Plan is the fourth iteration of the Kennebec County Hazard Mitigation Plan and expands upon previous Plan Updates by incorporating a broad array of plans, studies, reports, technical information, professional contacts, and other resources discovered since the last Plan Update. The review and incorporation process was based on objectives for the current Plan Update to utilize best-available information and provide a comprehensive assessment of hazards, vulnerabilities, capabilities, mitigation actions to reduce risk, and implementation strategies at



## Kennebec County Hazard Mitigation Plan - 2021 Update

local, county, state, and federal scales. Local, state, and federal authoritative data and reports are used throughout the Plan to support these objectives. Specific reports, plans, studies, reports, guidance, and technical information are referred to throughout the Plan.

In addition to the resources listed above, the following plans were reviewed in preparation for this Plan Update:

Kennebec County 2016 Hazard Mitigation Plan:

<http://kcema.org/assets/2016MitigationPlan.pdf>

State of Maine 2019 Hazard Mitigation Plan:

<https://www.maine.gov/mema/hazards/natural-hazard-mitigation>

Reference and brief review of KVCOG's Comprehensive Economic Development Strategy 2017-2022: <https://www.kvcog.org/images/PDFs/2017-2022-KVCOG-CEDS-FINAL.pdf>

City of Augusta Comprehensive Plan:

[https://www.augustamaine.gov/departments/development\\_services/comprehensive\\_plan.php](https://www.augustamaine.gov/departments/development_services/comprehensive_plan.php)

City of Hallowell Comprehensive Plan:

[https://hallowell.govoffice.com/index.asp?SEC=20DB666D-1191-493F-84BD-773246D680F3&Type=B\\_BASIC](https://hallowell.govoffice.com/index.asp?SEC=20DB666D-1191-493F-84BD-773246D680F3&Type=B_BASIC)

City of Gardiner Comprehensive Plan:

<https://www.gardinermaine.com/comprehensive-plan-review-implementation-committee/pages/comprehensive-plan-and-amendments-2014>

City of Waterville Comprehensive Plan:

<http://www.waterville-me.gov/planning/2014-comprehensive-plan/>

Town of Oakland Comprehensive Plan:

<https://www.oaklandmaine.us/comprehensive-plan/>

Town of Monmouth Comprehensive Plan:

<https://monmouthme.govoffice2.com/vertical/sites/%7B5A531869-23E9-4160-B9EE-E251D8379D47%7D/uploads/%7B5A8BE2DF-2DFC-4160-ACF7-69FAFDE9C366%7D.PDF>

## SECTION 4 RISK ASSESSMENT

### ***Risk Assessment***

*Requirement: §201.6(c)(2): (The plan must include) a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

### **Introduction**

The Code of Federal Regulations, 44 CFR §201 .6(c)(2) of the Rule outlines specific information that Kennebec County must consider when completing the risk assessment portion of this mitigation plan. Our local risk assessments provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. This plan includes detailed descriptions of all the potential hazards that could affect the jurisdiction along with an analysis of the jurisdiction's vulnerability to those identified hazards. Specific information about numbers and types of structures, potential dollar losses, and an overall description of land use trends in the jurisdiction are included in this analysis. Because this is a multi-jurisdictional plan, the risks that affect only certain regions of the County were assessed separately in the context of the affected region.

### **Climate**

No risk assessment of Kennebec County's flood and related hazards would be complete without first considering its climate and geography. Factors such as seasonal temperatures, annual precipitation, prevailing wind directions and geographical features can all profoundly affect both the occurrence and severity of flooding and related hazards.

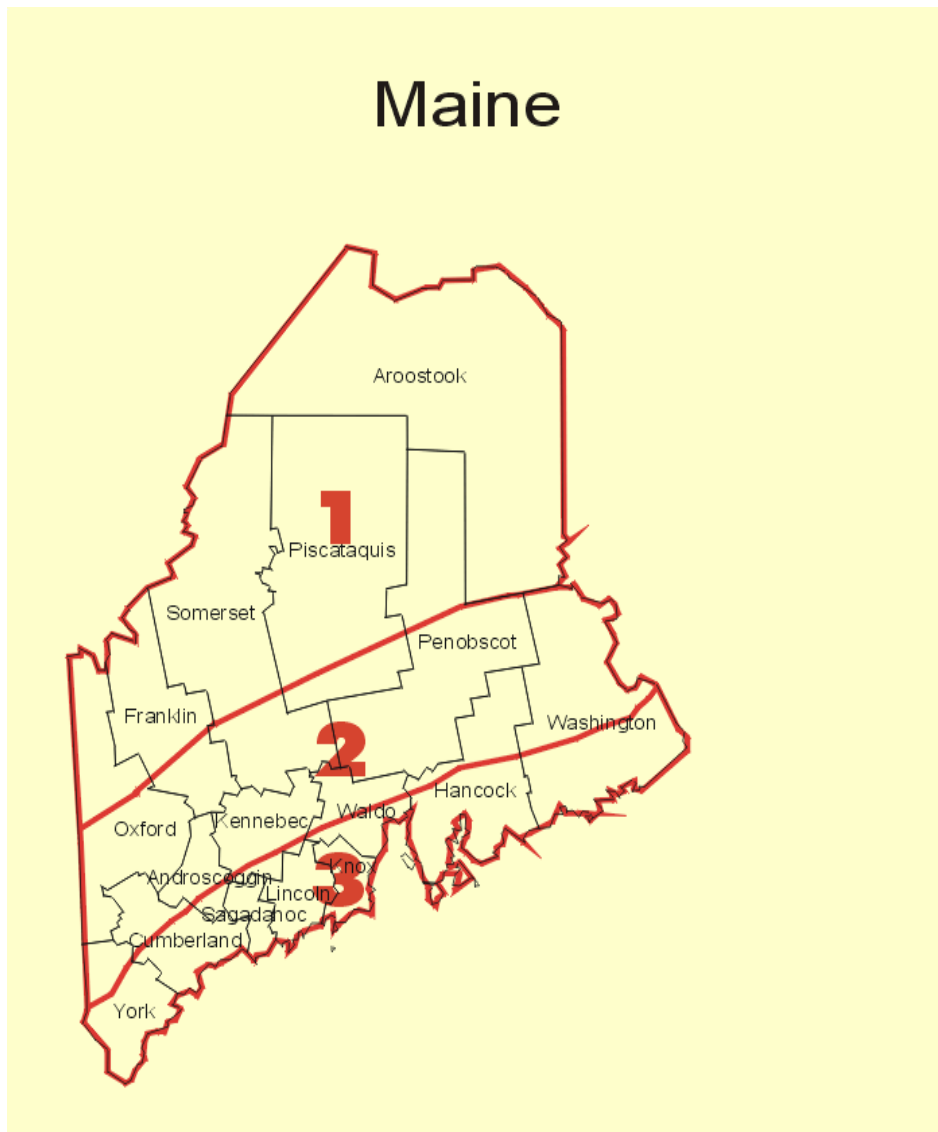
Kennebec County is located almost entirely in the Southern Interior climate division of Maine (see map). This division contains approximately 10,307 square miles and is only partially subject to marine influences.

**Temperature:** Average annual temperature is about 45 degrees Fahrenheit. Temperatures average about 64 degrees Fahrenheit in July and August, and about 18 degrees Fahrenheit in January and February.

**Precipitation:** Kennebec County's average amount of precipitation, based on long-term records dating back to 1895, is 42.6 inches. This includes the conversion of all snowfall to a water-equivalent. Average monthly precipitation is between three and four inches, with November being the wettest month, and February being the driest month.

**Prevailing Winds:** Prevailing wind direction varies with both season and location. Local influences such as orientation of a valley also may play a key role in dictating prevalent wind direction at any one location. Most of the County is under northwest to west-northwest winds throughout much of the year and particularly during the winter. During the summer, southwest to southerly winds may become quite frequent.

### Climate Divisions of Maine



**Geography:** Overall, the terrain across much of Kennebec County is hilly. The present-day landscape is a direct result of glacial erosion and deposition from the large ice sheets that completely covered Maine as recently as about 14,000 years ago. A variety of glacial deposits cover the County, providing a rich variety in the overall landscape as well as abundant sand and gravel for construction material. Many of these deposits also are excellent sources of ground water (that is, aquifers) for household and industrial water supplies. In addition, glacial deposits and erosion are directly responsible for the lakes found in Kennebec County.

Extensive wetland areas that provide habitat for many ecosystems are also a result of past glaciations in combination with existing climatic conditions. Maine is the most forested state in

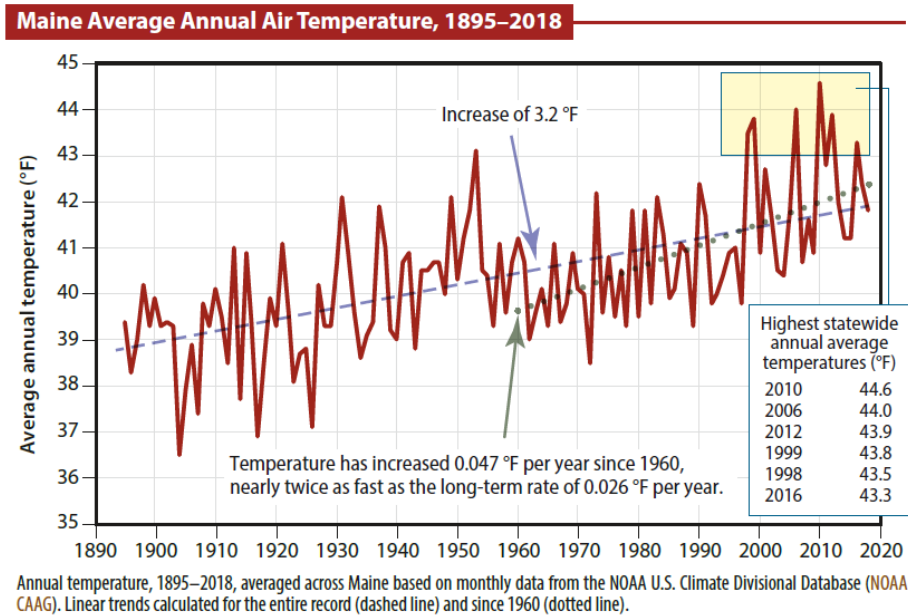
the United States with 90% of its land area in woodland. Historically, this has supported a considerable lumber and paper products industry. These forests also provide habitat for abundant wildlife, and together with the large number of lakes are a great resource for sports and recreation.

**Climate Variation**

The purpose of this part of the plan is not to debate climate change or its causes, but to provide an overview of how climate has changed over time, as documented in various scientific studies, and how that change may be impacting the occurrence and severity of natural hazards in Kennebec County. Projecting future climate change can be problematic because, as stated in the document “Maine’s Climate Future, 2020 Update,” by the University of Maine, “Climate projections are uncertain for several reasons: natural climate variability, incomplete descriptions of the climate system in computer models, and difficulty in predicting future greenhouse gas emissions (page 6).”

**Temperature Changes:** Excerpts from the report “Maine’s Climate Future, 2020 Update,” prepared by the University of Maine, include the following:

“Temperatures are increasing statewide. Average annual temperature has increased 3.2 degrees Fahrenheit (°F) in the last 124 years, and the rate of warming has increased most notably since 1960. The six warmest years on record have occurred since 1998. Indeed, the Northeast is warming faster than any other region in the U.S., and is projected to warm 5.4 °F (3 °C) when the rest of the world reaches 3.6 °F (2 °C) (Karmalkar and Bradley 2017).” (Page 3)



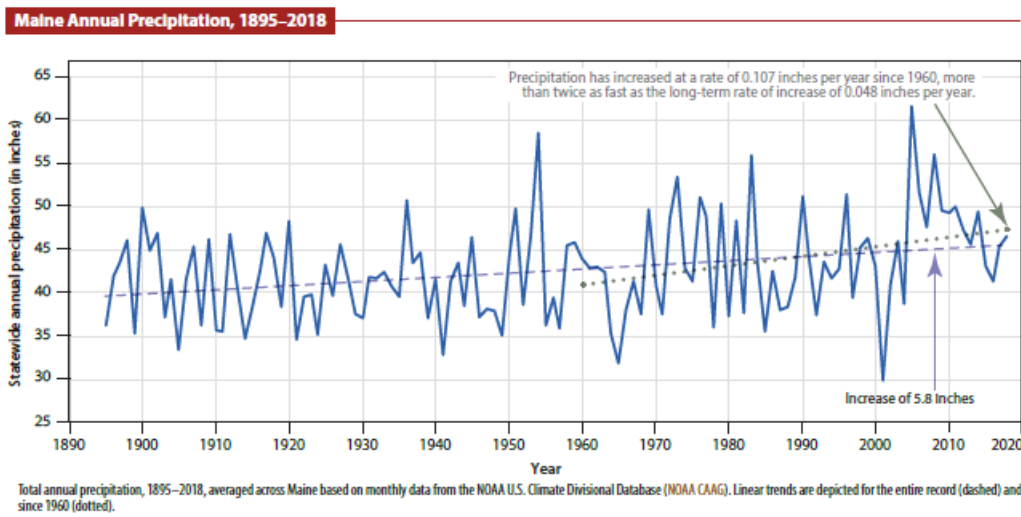
Graph taken from the “Maine’s Climate Future, 2020” Update (Page 3)

## Kennebec County Hazard Mitigation Plan – 2021 Update

According to “Maine’s Climate Future, 2020 Update,” the impacts of rising temperature in Maine include an increase in Lyme disease resulting from more suitable habitat for deer ticks and their hosts, and stresses on Maine’s plant and animal species. The report does not indicate that temperature increases affect the severity of the hazards identified in this plan.

**Precipitation Changes:** Excerpts from the report “Maine’s Climate Future, 2020 Update,” include the following:

“Average annual precipitation has increased 15 percent (5.8 inches) since 1895, and the increase has come in the form of more rain, and less snow. Since 1895, depth of annual snowfall has decreased 20 percent (2.3 inches). As with temperature, the rate of increase has accelerated in recent decades.” (page 5).



Graph from “Maine’s Climate Future, 2020 Update” (page 5)

“As elsewhere in Maine, precipitation in Farmington has increased, and most dramatically in the last two decades. A closer look at the Farmington data shows that most of the increased volume (30 percent over previous decades) was due to more 1-inch and 2-inch events, although large rain events of three or four inches have also become much more common relative to the past. Intensity of precipitation has increased, *and* it is raining more often. Farmington now experiences 10–15 more precipitation events in a year than during the previous century.” Page 6

“From north to south, inland to the coast, the most warming has occurred in the winter, with average minimum temperatures increasing 3.7 to 4.3 °F over the long-term. Warming winter temperatures mean that more precipitation is falling as rain instead of snow. Statewide average annual snowfall is estimated to have decreased by about 17 percent over the past century. A lesser downward trend of 3 percent is estimated since 1960, partially attributed to increased moisture availability associated with warmer air.” (Page 8)

“Since the mid-1990s, there has been considerable variability, with winters of low

Kennebec County Hazard Mitigation Plan – 2021 Update

snowfall (e.g., 2004 and 2010) and high snowfall (e.g., 2008 and 2019). In addition, there can be considerable local variability at specific stations when compared to the statewide trend shown here. Northern Maine in particular diverges from the broader trend: the Caribou station shows that January 2019 was the snowiest month on record (58.9”) and 2018–19 winter season as a whole was the third-snowiest on record since record keeping began in 1939 (NWS 2020a).” (Page 8)

<b>Description of Hazards</b>	
<b>Requirement §201.6(c)(2)(i):</b> (The plan shall include) a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	
Element	B1. Does the Plan include a description of the type, location and extent of all natural hazards that can affect each jurisdiction?
	B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction?

**Description of All Natural Hazards potentially affecting Kennebec County**

The following table identifies all of the natural hazards that could potentially affect Kennebec County. The list is based on FEMA’s list of natural hazards, although some of the natural hazards have been grouped together. For example, blizzards, ice storms, nor’easters and snow storms are grouped under winter storms, even though nor’easters can occur at other times of the year.

<b>Summary of All Natural Hazards potentially affecting Kennebec County</b>		
<b>Hazards Profiled in this Plan</b>		
<b>Natural Hazards</b>	<b>How Identified</b>	<b>Comments</b>
Flooding	Review of 2020 hazard mitigation returns from Kennebec County municipalities; review of Maine State Hazard Mitigation Plan 2018 Update; FIRM Maps, Input from residents Review of past disaster declarations,	There is a history of flooding in many parts of the county, particularly along the Kennebec and Sebasticook Rivers. Flooding is often associated with the effects of spring runoff and high rain events. Several repetitive loss properties and roadways are located in the County. The County contains one major river and a very large number of smaller rivers and streams.

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Summary of All Natural Hazards potentially affecting Kennebec County</b>		
<b>Hazards Profiled in this Plan</b>		
	Identification of repetitive losses, Committee and local knowledge,	
Severe Winter Storm Events	Review of past disaster declarations Input from residents, records from 1998 ice storm, State Hazard Mitigation Plan 2018 Update	Maine is frequently hit with blizzards, ice storms and “Northeasters”. In 1998, a major ice storm hit Maine, knocking out power in many locations for days. The impacts of such severe winter storms include extra costs for snow and debris removal.
Wildfire	Review of Maine Forest Service records Input from residents, Committee and local knowledge. Risk assessment	Much of the County is covered with forests. Wildfires have been numerous, though small, in the past. Wildfires can destroy land cover which, in turn, can cause erosion and sedimentation and exacerbate flooding.
Severe Summer Storms	Review of past disaster declarations, State Hazard Mitigation Plan 2018 Update	Summer storms accompanied by high winds often cause large scale power outages and road closures due to falling trees. Storms can also lead to road and culvert washouts.

<b>Hazards not Profiled in this Plan</b>		
<b>Natural Hazards</b>	<b>How Identified</b>	<b>Comments</b>
Avalanche	Review of USGS Maps	There are no mountains in the county that hold large amounts of snow which would create avalanches.
Blight/ Infestation	Review of State Entomological Office historical records, State Hazard Mitigation Plan 2018 Update, Committee knowledge	Though the County has some agricultural production, including forestry and farming, there are no historical records of major damage to these products that have caused serious economic conditions.
Dam Failure	Review of Historical Records Risk Assessment	Although there are a great many small dams, a failure of one of these dams will normally only cause only minor localized flooding. Dam failure is profiled under flooding.
Drought	Review of MEMA records State Hazard Mitigation Plan 2018 Update,	The County has seen an increase in frequency, duration, and severity of droughts. In 2016, 2020, and 2021, MEMA reconvened the Maine Drought Task Force as a result of prolonged below average precipitation. KCEMA is a member of the Task

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Hazards not Profiled in this Plan</b>		
<b>Natural Hazards</b>	<b>How Identified</b>	<b>Comments</b>
	Review of NOAA records	Force. Currently, drought has a low impact in the county and will not be profiled in this plan but will continue to be assessed and profiled if the need arises.
Earthquake	Review of Maine Geological Survey records, State Hazard Mitigation Plan 2013 Update	Although minor earthquakes (magnitude less than 4.0) are common in Maine, no significant damaging movement has occurred in 20,000 yrs.
Hurricanes	Review of past disaster declarations, review of library historical data Input from State Hazard Mitigation Plan 2018 Update	Hurricanes tend to downgrade to tropical storms by the time they strike inland counties, such as Kennebec County, and hence their effect is usually flooding and power outages.
Landslide	Review of Maine Geological Survey records State Hazard Mitigation Plan 2018 Update	Landslides are not common in Kennebec County. However, sometimes steep embankments can be subject to landslides, particularly along rivers and streams.
Subsidence	Review of Maine Geological Survey records	There have been no known cases of subsidence in Kennebec County.
Tornado & Severe Wind Storms	Review of NWS records	Although several F0 or F1 tornadoes may occur in the State of Maine each year, there have been no loss of life or major damages in many years. Neither have there been any recorded damages from microbursts in Kennebec County. Strong winds associated with severe winter and summer storm events are included in those hazard descriptions.
Pandemic	Review of the effects the 2020 COVID-19 pandemic had on Kennebec County, DR-4522-ME	While there has not been a widespread global pandemic in over a century, the COVID-19 pandemic has shown the challenges of trying to maintain operations with the obstacles a pandemic brings. Since the full effects of this pandemic are not understood yet, it will not be profiled in this plan but could be addressed in future plans if the need arises.

The Kennebec County Hazard Mitigation Planning Team identified four natural hazards that are addressed in the County Hazard Mitigation Plan: Flooding, Severe Winter Storms, Wildfire and severe summer storms. These hazards were identified through an extensive process that utilized input from the Hazard Mitigation Planning Team members, public input, researching past disaster declarations in the County, a review of current maps, and risk assessments completed by the Kennebec County Emergency Management Agency and the County Hazard Mitigation Planning Team.

The following table rates the natural hazards to be profiled.



Kennebec County Hazard Mitigation Plan – 2021 Update

Key to Rating

Severity of hazard

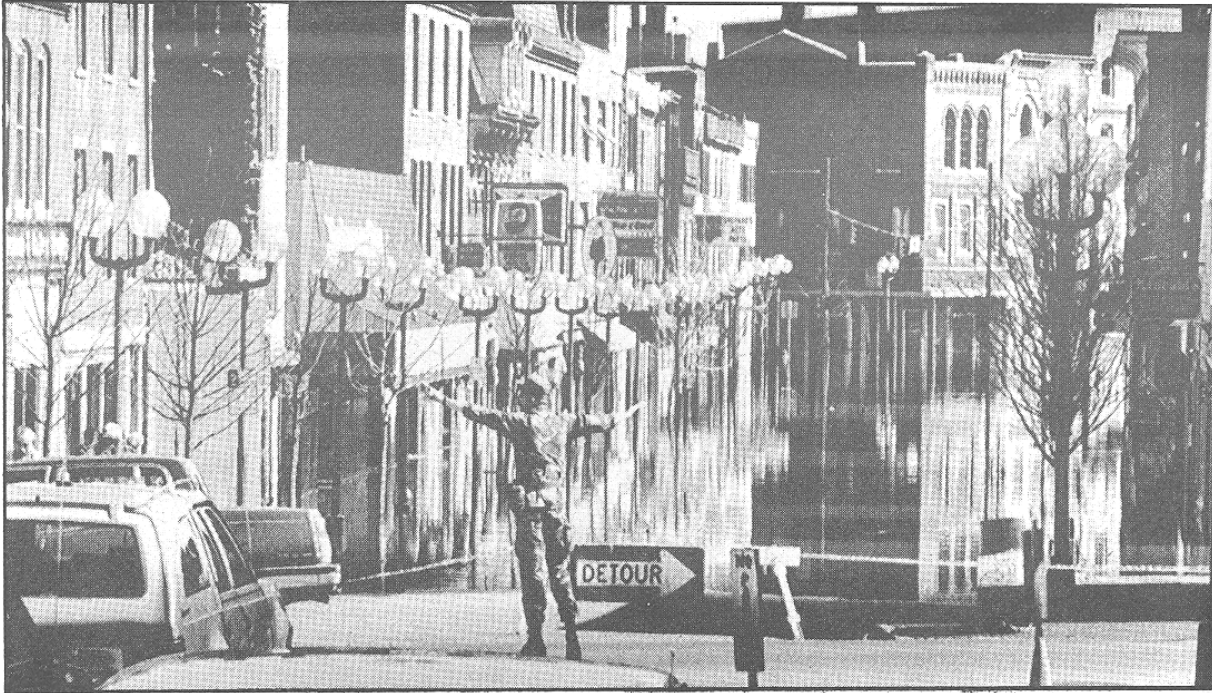
- 3 Severe: Multiple deaths, mass casualties, or millions of dollars in damages
- 2.5 High: Deaths or injuries; or \$100,000s in damages
- 2 Moderate: Single death or several injuries; or \$10,000s in damages
- 1.5 Low: Injuries; or \$1,000s in damages
- 1 Slight: No deaths, single injury; or \$100s in damages

Likelihood of Hazard

- A. Very Likely
- B. Possible
- C. Very unlikely

<b>Rating of Hazards by Hazard Mitigation Planning Team</b>				
<b>Type of Hazard</b>	<b>Potential Damages</b>	<b>Source of Information</b>	<b>Rating</b>	<b>Priority</b>
Flooding	Damages to structures in flood zones, bridges, culverts and roads	FEMA, MEMA State Plan Other plans	3A	1
Severe Winter Storm	Downed power lines, blocked roadways and heavy snow damage to roofs	FEMA, MEMA State Plan Other plans	2.5A	2
Wildfire	Timber lost, homes lost, businesses lost	Maine Forest Service/ State Plan Other plans	2B	3
Severe Summer Storms	Damages to structures in flood zones, damages to bridges, culverts and roads; downed power lines	FEMA, MEMA sources	1.5B	4

## FLOODING



National Guardsman at one end of Water Street in Gardiner, April, 1987. Associated Press

### Introduction

Kennebec County is subject to flooding. There are two major rivers located within the borders of Kennebec County. The Kennebec River is bordered by the municipalities of Augusta, Benton, Chelsea, Clinton, Farmingdale, Gardiner, Hallowell, Pittston, Randolph, Sidney, Vassalboro, Waterville, and Winslow. The Sebasticook River is bordered by the municipalities of Benton, Clinton, and Winslow. The Kennebec River has three large dams on the river at Waterville-Winslow and Benton. The Sebasticook River had two dams on it in Benton and Winslow, but Fort Halifax (the first dam on the Sebasticook) has been removed. Flooding from the Kennebec and Sebasticook rivers has occurred on many occasions in Kennebec County communities. In addition, there are other dams outside of Kennebec County that also pose a threat. The Wyman Dam located in Bingham poses the bigger threat to Kennebec County and KCEMA participates in preparedness efforts.

**General Definition of Flooding in Kennebec County.** Flooding is a temporary inundation of normally dry land as a result of: 1) the overflow of inland waters; and/or 2) the unusual and rapid accumulation or runoff of surface waters from any source. Note: the nature of Kennebec County's geology and hydrology is such that flooding is usually fast rising but of short duration.

**Types of Flooding in Kennebec County.** There are several different types of potential flooding in Kennebec County:

- **Beaver Dam Flooding:** Flooding resulting from back-up and overflow of water resulting from beaver dams.

- **Dam failure:** The sudden release of water resulting from structural collapse or improper operation of the impounding structure. Dam failure can cause rapid downstream flooding, loss of life, damage to property, and the forced evacuation of people.
- **Flash flood:** A flood event occurring with little or no warning where water levels rise rapidly due to heavy rains, ice jam release, or rapid snow melt.
- **Ice jam:** An accumulation of floating ice fragments that blocks the normal flow of a river. During a thaw or rainstorm, the rapid increase in discharge from snow melt and/or rainfall can rapidly lift and break up a thick ice cover and carry it downstream as an ice run. Ice runs can jam in river bends or against the sheet ice covering flatter reaches. The resulting ice jams can block flow so thoroughly that serious flooding may result within an hour of their formation. Failure of an ice jam suddenly releases water downstream. Damages from ice jam flooding usually exceed those of clear water flooding because of higher than predicted flood elevations, rapid increase in water levels upstream and downstream, and physical damage caused by ice chunks. Moving ice masses can shear off trees and destroy buildings and bridges above the level of the flood waters.
- **Lacustrine:** (Lake Flooding). Lacustrine flooding occurs when the outlet for the lake cannot discharge the flood waters fast enough to maintain the normal pool elevation of the lake. During a base flood event, normal increases in water surface elevations on most Maine lakes and ponds range from 1 to 5 feet. However, in Maine there are some examples where the base flood event will reverse the flow of the outlet stream. In such instances, river and base flood elevations can rise more than 15 feet above normal pool. While this can impact individual dwellings built near the water's edge, there are no records of major damages so this type of flood will not be further addressed in the Plan.
- **Riverine/riparian:** Periodic overbank flow of rivers and streams, usually the result of spring runoff, but can also be caused by major rain storms.
- **Urban:** Overflow of storm sewer systems, usually due to poor drainage, following heavy rain or rapid snow melt. The combined sanitary and storm water systems that some urban areas installed years ago can cause flooding of sanitary sewerage when riparian floods occur. Runoff is increased due to a large amount of impervious surfaces such as roof tops, sidewalks and paved streets.

### **Nature of the Hazard from Dam Failure**

Maine dams were constructed incrementally over a period of 300 years. Businesses harnessed the abundant fast flowing rivers and rocky rapids for the development of energy and transportation. Many dams throughout the country are now aged, and in Maine the majority of these structures are nearly 100 years old and beyond the normal design life of civil engineering works. Many are low head dams constructed using local materials of stone, timber and earth. Dam failure is not a frequent occurrence, but it can and does occur.

Regarding the possibility of flooding from dam failure, MRSA Title 37-B, Chapter 24, also known as Maine's Dam Safety Law, classifies dams into three hazard potential ratings: high, significant and low. Each rating carries different responsibilities for the dam owners and situational awareness on the part of downstream residents and businesses. Dam owners with "high" or "significant" potential hazard ratings must produce an emergency action plan (EAP) and forward it to MEMA for compliance with the law. The primary purpose of the EAP is to alert and warn potentially affected residents and businesses in the listed "call down area" when

Kennebec County Hazard Mitigation Plan – 2021 Update

there is a threat of failure or actual breach. Copies are kept by the owner, relevant local, county and state agencies and must be updated every two years. See definition excerpts from the law in the table below:

<b>Hazard Ratings Excerpts from Dam Safety Law Definition</b>	
<b>High</b>	“...will probably cause loss of human life;”
<b>Significant</b>	“...no probable loss of human life but can cause major economic loss...”
<b>Low</b>	“...no probable loss of human life and low economic...losses”

The majority of the Kennebec County dams are located at the outlets of a vast number of lakes and ponds and are small in size. These dams are in very good condition and procedures are in place for effective flood management. There are 4 High Hazard, 7 Significant and 44 Low Hazard dams located within Kennebec County. The following table provides a summary of the High Hazard and Significant Hazard dams in Kennebec County.

<b>Kennebec County High Hazard and Significant Hazard Dams</b>				
<b>MEMA ID/H/S</b>	<b>Dam Name</b>	<b>City/Town</b>	<b>Dam Owner</b>	<b>Water Body</b>
<b>High hazard Dams</b>				
346	New Mills	Gardiner	Four Town Watershed	Cobbossecontee Stream
363	American Tissue	Gardiner	KEI Power Management & UAH-Hydro Kennebec LTD	Cobbossecontee Stream
463.2	Hydro-Kennebec	Winslow	Madison Paper Industries & UAH-Hydro Kennebec LTD	Kennebec River
529	Snow Pond	Oakland	Maine Renewables, LLC (div. Synergics)	Messalonskee Stream
<b>Significant Hazard Dams</b>				
88	Dinsmore	China	Stephen & Christine Coombs	Branch Mills Pond
92	Cobbossecontee Outlet	Manchester	Manchester	Cobbossecontee Stream
95	Carleton Pond	Winthrop	Augusta Water District	Carleton Pond
96	Conchnewagon	Monmouth	Monmouth	Mud Mills Stream
294	Parker Pond	Mt. Vernon	Parker Pond Association	Parker Pond
426	Rice Rips	Waterville	Maine Renewables, LLC (div. Synergics)	Messalonskee Stream
452	Augusta East Landfill	Augusta	Augusta Tissue LLC	n/a

Source: Maine Emergency Management Agency

## Kennebec County Hazard Mitigation Plan – 2021 Update

With respect to the high hazard dams shown in the table, Gardiner, Winslow and Oakland would be most at risk from a dam breach since release of impoundments of those dams could cause loss of life. In terms of the significant hazard dams shown in the table, China, Winthrop, Monmouth, Manchester, West Gardiner, Mount Vernon, Waterville, Augusta, and the communities downstream could expect infrastructure damages, especially to roads and bridges if their dams were to breach. There has been one dam failure in Kennebec County in recent years. In 1997, Apple Valley Dam in Monmouth breached, causing about \$350,000 in damages. It was not rebuilt. In 2014, a mill building connected to the Branch Pond Dam in China was condemned as a public safety hazard and the Maine Dam Safety Program ordered removal of the structure. The dam remains in suitable condition and is owned by the Atlantic Salmon Federation. Branch Pond Dam is located near the border of Kennebec and Waldo counties; in the unlikely event of dam failure, communities from both counties may be impacted.

From 2019 to 2021, there have been several High Reservoir Level warnings for FERC-licensed hydroelectric dams in Kennebec County. These warnings signify a high flow threshold is met, triggered from runoff or rain events, but impacts are limited to potential flooding in low-lying areas downstream.

**Nature of Flood Hazard other than Dam Failure.** Severe flooding can cause loss of life, property damage, disruption of communications, transportation, electric service and community services, crop and livestock damage, health issues from contaminated water supplies, and loss and interruption of business. Ironically, firefighting efforts can be compromised if fire fighters and equipment are responding to a flood emergency.

Generous precipitation (about 44 inches a year) contributes to the flood potential. The low pressure system over the Eastern Seaboard and the tendency of some storms to follow one another in rapid succession provide heavy, combined moisture. Water abundance is one of the State's most valuable natural resources and its primary hazard.

Records of past flood events indicate that the April 1, 1987 flood along the Kennebec River was one of the most significant in Maine history. Flood damage along the Kennebec River and in the Kennebec Basin was the greatest for any flood (including that of March, 1936) for which data are available. In Augusta, flooding of first floor buildings in the downtown was extensive; in Hallowell, many stores in the downtown had several feet of water in them, and in Gardiner, businesses on both sides of Cobbossee Stream suffered flood damages when the high waters of the Kennebec caused water in Cobbossee Stream to back up and overtop its banks. The flood of 1987 took place in free-flowing conditions. Had there been ice jams, backwater from these jams could have made the flooding far worse.

According to MEMA's Flood Management/River Basin report, in April, 1987, runoff caused by a high volume of rainfall following several days of warm temperatures and melting snowpack caused a new flood of record for the Kennebec River from the mouth of the Carrabassett tributary to the mouth of the Kennebec River.

The Land and Water Resources Center at the University of Maine prepared a special report on the flood of 1987, excerpts of which are included in the paragraphs below:

## Kennebec County Hazard Mitigation Plan – 2021 Update

The Kennebec River near Augusta normally flows with a surface elevation just above sea level. With heavy rains over central and western Maine, the Kennebec began to rise early Tuesday, March 31, 1987. That afternoon, at 3:00 pm, the river reached flood stage at 13 feet. By 7:00 pm, it was over Augusta's Front Street, which has an elevation of 15 feet. Flood waters continued to rise the next day (Wednesday, April 1) and finally crested early Thursday morning at 34 feet, the highest recorded level for this century.

Why was the flood so damaging? ...the damages were greatly magnified by:

- the extensive development that has taken place in the state's river floodplains;
- the porridge of uprooted trees, flotsam, sewage and oil that swept through residential and business areas;
- the lack of preparedness on the part of Maine people, especially owners of property in floodplains; and
- shortcomings in the warning system and failure of people to take seriously warnings that were issued at the outset of the flood.

Flow records – Kennebec River near Augusta: 220,000 cubic feet per second (compared to 160,000 cubic feet per second in 1936).

Rainfall accumulations were generally 4 to 6 inches in central Maine (with totals over 7 inches at some locations). What Maine had, then, was 4 to 6 inches of rain combined with another 6 inches or more of melted snow – all of this on frozen ground with limited capacity to absorb water.

During the day of Wednesday, April 1, as rivers continued to rise, torrents of water swept over low-lying neighborhoods, business areas and highways. Some 400 small businesses were flooded – most of these in submerged business areas in Rumford, Winslow, Hallowell, Gardiner, and small municipalities like Farmington Falls. Many roads throughout the flooded areas were severely eroded or partly washed out.

There was severe damage to sewage treatment plants at Augusta, Waterville, and Anson/Madison. A small number of public buildings (including a fire station and two libraries) were damaged, and the fort building at the Fort Halifax State Historic Site was washed away. Public water systems were disrupted in two communities, where public water lines across rivers were washed out. Many private wells were flooded and contaminated by floodwaters.

### **Location of Flooding Hazard.**

The communities of Augusta, Benton, Chelsea, Clinton, Farmingdale, Gardiner, Hallowell, Pittston, Randolph, Sidney, Vassalboro, Waterville, and Winslow are located along the Kennebec River.

Kennebec County's susceptibility to flooding, especially riverine flooding, is further exacerbated by its wide-ranging weather conditions. Many major flooding events occur during the spring months of April and March when the winter snow is melting due to rising temperatures and rain.

## Kennebec County Hazard Mitigation Plan – 2021 Update

Flooding in the winter months can be exacerbated by heavy rain and freezing temperatures leading to ice jams, which is discussed in the Severe Winter Storms section. Floods can also be caused by the heavy rains of hurricanes that arrive as tropical storms.

The County EMA has reviewed the County's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) to compile a profile of the flooding hazard in the County. The EMA staff completed research on flooding history in the County and indicated this data on the GIS base maps. The Municipal Base Maps show the areas susceptible to potential flooding. This provides a clear picture of areas and structures most vulnerable to flooding.

In the fall of 2020, Kennebec EMA conducted a visual assessment to determine the number of structures located within flood zones. Utilizing the Maine Flood Hazard Map; it was determined that there are approximately 1,894 structures located in a type of flood zone or floodway. The Kennebec River was noted to have the most structures with approximately 361 structures followed by Cobbossecontee Lake with 210. Great Pond (155) and China Lake (132) are the other two bodies of water within Kennebec with more than one hundred structures in a flood zone. The majority of structures were found to be in Flood Zone A or AE meaning that there is a one percent chance annual flood change, or these structures could be affected in a 100-year flood.

### Location of Municipal Flood-Prone Areas.

The following is a summary of areas that are subject to flooding and/or that have had repeated flood damages in specific jurisdictions, as identified in returns from the Kennebec County Hazard Mitigation Survey in 2020 and follow up surveys in 2021.

- **Albion-** We have no specific areas in the town susceptible to flooding. We have many culverts where localized flooding may occur depending on ice and other conditions.
- **Greater Augusta Utility District-** WWTP (Wastewater Treatment Plant) is vulnerable to significant flooding 10 to 2 year events; pump station 3 on Front Street (Augusta) is subject to risk under one to two year events.
- **Augusta-** Front St., Waterfront Park and East Side Boat Landing. Bangor St and Sewall St.
- **Belgrade-** Belgrade has five lakes within it: Great Pond, Long Pond, Messalonskee Lake, and McGrath Pond-Salmon Lake. Each has streams flowing into and from them, the most significant being Belgrade Stream, which connects Long Pond and Messalonskee. Properties along those lakes and streams are susceptible to flooding, depending upon the amount, rate and duration of rainfall.
- **Benton-** Some parts of Pleasant Street and Comment Street - Kennebec River. Intersection of Albion Rd & East Benton Rd. Unity Rd on the town line with Unity
- **Chelsea:** Butternut Park end of Ferry Rd and the area around 570 Windsor Rd
- **China:** Branch Mills Dam
- **Clinton-** Water St, Pleasant St (near the river), Main St (near the river), River Rd
- **Fayette(2015):** Hales Brook crossing on Richmond Mills Road, Mosher Pond inlet on Campground Road.
- **Gardiner:** Downtown area

## Kennebec County Hazard Mitigation Plan – 2021 Update

- **Hallowell:** Kennebec River **Manchester(2015):** Sometimes on the Pond Road by the mall and Elliott Avenue.
- **Monmouth:** Most of the flooding our town experiences is a result of water runoff damage on the edges of roadways or overrun/plugged culverts. The plugged culverts can result from beavers, debris pile-up or just excessive water buildup. The Sanborn, Waugan and Annabessacook Roads have historically been an issue with minor flooding of the roadways. As far as water runoff, Welch, Berry, Waugan, Academy, Blue, Norris Hill, Oak Hill Roads and Oak Hill Acres have had erosion damage.
- **Oakland-** Minor street flooding, Messalonskee Stream at Water St, usually minor
- **Readfield(2015):** The town has no large rivers or streams; damage from flooding is culverts and ditches. **Vassalboro:** No Known flooding hazard areas
- **Waterville:** Water Street, Front Street, Areas Boarding the Kennebec and Messalonskee Stream
- **Wayne:** Seasonally, every spring, after the winter snow melts in the mountains the Androscoggin River floods. This spring flood causes the Dead River to reverse flow filling up the Androscoggin Lake Basin. Several lakefront properties are susceptible to high water events on Androscoggin Road. During high water events one neighborhood' (West Acres) cannot access the Town Road. The Town owns two dams: 1) Village Dam, holding back Pocasset; 2) North Wayne Dam, holding back Lovejoy Pond.
- **Winslow-** The area susceptible to damage from flooding is the south end of Lithgow Street when the Kennebec reaches flood stage.

**Windsor(2015):** Weeks Mills Road bridge, Shuman Road bridge/culvert, Choate Road bridge, Greeley Road culvert, Sampson Road bridge, Reed Road culvert, Maxcy's Mill Road bridge, Griffin Road, Cooper's Mill Road, Hunts Meadow road, Wingood Road, Tyler Road, Routes 105 and 32.

### **Extent of the Hazard**

Flood damage in Kennebec County is also caused by winter runoff from heavy rain events that melt the snow pack quickly. The runoff quickly overwhelms the wetlands, ponds, lakes, streams and rivers and spreads to the neighboring surface areas. The soil is still in a state of frozen permafrost, which eliminates any soil infiltration. There are nearly 84 square miles of water bodies in the County. This flooding undercuts or overtops adjacent roads. Typically, this road damage is not major, though it can absorb the municipal road maintenance budget for an entire year and does happen in several of the municipalities every year

The following is a summary of the extent of flooding, based on data obtained from the National Weather Service in Gray:

The extent of flooding in Kennebec County is best represented by historic flood crests monitored by the U.S. Geological Survey and reported under different flood categories by the National Weather Service in Gray, Maine. A flood crest is the maximum height reached by floodwaters before eventually receding. The National Weather Service defines flood extent using different flood stage categories, indicating the degree to which waters overflow the natural river banks and begin flooding surrounding areas. The gage station at Sidney is well suited for monitoring flood extent because it is located just downriver of Waterville and



## Kennebec County Hazard Mitigation Plan – 2021 Update

Winslow, and just upriver of Augusta, Hallowell, and Gardiner, all fairly densely populated jurisdictions with a history of flooding<sup>1</sup>.

### Kennebec River at North Sidney:

#### Flood Crests

- Action Stage: 15 feet
- Flood Stage: 17 feet
  - Minor lowland flooding begins
- Moderate Flood Stage: 25 feet
- Major Flood Stage: 30 feet
  - 29 feet – Portions of Lithgow Street in Winslow floods
  - 34 feet – Portions of Lithgow Street in Winslow flood to a depth of 3 to 5 feet
  - 39 feet – Widespread flooding occurs in Waterville and Winslow. Water street in Waterville floods. In Winslow route 201, 100, and 137 flood.

#### Historic Crests

- 39.31 feet on 04/02/1987
- 26.60 feet on 06/01/1984
- 26.40 feet on 04/28/1979
- 25.69 feet on 04/26/1983
- 25.56 feet on 01/28/1986

#### Recent Crests

- 21.25 feet on 04/16/2014
- 18.79 feet on 06/04/2012
- 20.85 feet on 12/14/2010
- 22.08 feet on 04/30/2008
- 22.29 feet on 04/04/2005

The gage station at Augusta is located in the downtown area where historic flooding has occurred. The gage is placed in a tidal portion of the Kennebec River and therefore also records tidal effects that are not encountered at North Sidney<sup>2</sup>.

### Kennebec River at Augusta:

#### Flood Crests

- Action Stage: 10 feet
- Flood Stage: 12 feet
  - 12 feet – Water begins to flood parking lots on Front Street in Augusta.
  - 15 feet – Much of the parking lot on Front Street in Augusta floods.
  - 17 feet – Water reaches the back of some buildings on Water Street in Augusta

<sup>1</sup> North Sidney gage station: <https://water.weather.gov/ahps2/hydrograph.php?wfo=gyx&gage=sidm1>

<sup>2</sup> Augusta gage station: <https://water.weather.gov/ahps2/hydrograph.php?wfo=gyx&gage=astm1>

## Kennebec County Hazard Mitigation Plan – 2021 Update

- Moderate Flood Stage: 25 feet
- Major Flood Stage: 30 feet
  - 34 feet – This is the approximate level of the 100 year flood. Devastating flooding occurs. Water rises up to the low steel on the Calumet Bridge.

### Historic Crests

- 34.00 feet on 04/02/1987
- 30.70 feet on 03/20/1936
- 19.58 feet on 01/13/2018
- 18.83 feet on 04/04/2005
- 18.80 feet on 04/19/2007

### Recent Crests

- 14.10 feet on 12/02/2020
- 14.16 feet on 04/21/2019
- 19.58 feet on 01/13/2018 (Hallowell)
- 13.46 feet on 04/12/2017
- 14.35 feet on 02/17/2016
- 18.83 feet on 04/04/2005
- 18.80 feet on 04/19/2007
- 18.50 feet on 04/29/2005
- 18.42 feet on 04/30/2008
- 13.80 feet on 04/17/2007
- 13.70 feet on 04/18/2007
- 14.80 feet on 10/30/2006

According to the National Weather Service website, the impacts of various water crests include:

- 12 feet: Water into parking lot on Front Street in Augusta
- 13 feet: Water covering dock at Town Landing in Hallowell
- 14 feet: Water 2 feet deep in parking lot on Front Street in Augusta; water to edge of Front Street in Hallowell
- 15 feet: Water covering Front Street in Hallowell
- 17 feet: Water to the back of some buildings on Water Street in Augusta

### **Previous Occurrences**

The following table contains a summary of floods that have occurred in Kennebec County, as reflected primarily in Presidential Disaster Declarations.

<b>Historical Summary of Major Flood Events in Kennebec County Since 1987</b>			
<b>Year</b>	<b>Month</b>	<b>General Description</b>	<b>Presidential Disaster Declaration #</b>

## Kennebec County Hazard Mitigation Plan – 2021 Update

1987	Apr 1	Major damage to homes, businesses, public buildings, sanitation facilities, erosion	FEMA 788
1992	Mar 27	Heavy rains, ice jams, road & culvert damage	FEMA 940
1993	Apr	Heavy rains, snow melt, road & culvert damage	FEMA 988
1998	June 13- Jul 1	Heavy rains damaged public roads and drainage systems	FEMA 1232
1999	Sep 17-18	Heavy rains from remnants of Hurricane Floyd lead to runoff exceeding flood stage on the Kennebec River.	None
2000	Mar 28, Apr 6	Flooding from heavy rains, spring run-off, ice jams	FEMA 1326
2001	Mar 5-31	Flooding from severe winter storms, record snowfall, high winds, heavy rains & run-off, ice jams	FEMA 1371
2004	Dec 10-31	Severe storms, flooding, snow melt & ice jams	FEMA 1508
2005	Mar 29- May 3	Severe storms, flooding, snow melt & ice jams	FEMA 1591
2007	Apr 15-23	Severe storms and flooding (Patriot's Day Storm)	FEMA 1693
2010	Jan 26-28	2 inches of heavy rainfall on melting snow caused an ice jam on the Kennebec River in Augusta and Hallowell	None
2013	Aug 28	2-4 inches of locally heavy rainfall in a short period of time led to many streets flooding in Waterville.	None
2014	Aug 13-14	Flash flooding washed out several roads across Kennebec county	None

Source: FEMA Declared Disasters website<sup>3</sup>, NWS Storm Events Database<sup>4</sup>, and MEMA records

NOTE: Kennebec County has not been in any flood declarations since 2007.

**Flood Losses in Dollars by Municipality.** Flood losses in Kennebec County have been extensive. The following table contains a summary of flood losses by Town for various Federal Disaster Declarations since 1987. The table includes only public assistance losses and does not include individual and business losses which can be substantial.

<b>Flood Losses in Dollars by Town and Federal Disaster Declaration Since 1987</b>								
	<b>#788 1987</b>	<b>#940 1992</b>	<b>#988 1993</b>	<b>#1232 1998</b>	<b>#1326 2000</b>	<b>#1508 2003</b>	<b>#1591 2005</b>	<b>#1693 2007</b>
Albion	\$2,632	3,243	0	0	0	0	0	13,175
Augusta	331,811	20,467	68,619	9,387	6,978	7,072	94,5980	0
Belgrade	9,429	6,019	11,779	0	0	0	0	1,271
Benton	18,001	604	493	0	0	0	0	0
Chelsea	7,751	4,465	1,758	0	0	7,619	280,189	464,238
China	14,044	863	0	9,848	6,908	0	42,835	0
Clinton	9,321	2,055	0	0	0	0	0	0
Farmingdale	11,202	6,948	5,275	33,989	0	0	0	0
Fayette	9,038	7,993	999	35,547	41,378	56,753	296,434	357,008
Gardiner	28,931	74,202	12,096	7,651	0	0	12,751	20,368

<sup>3</sup> FEMA Declared Disasters: <https://www.fema.gov/disaster/declarations>

<sup>4</sup> NWS Storm Events Database: <https://www.ncdc.noaa.gov/stormevents/>

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Flood Losses in Dollars by Town and Federal Disaster Declaration Since 1987</b>								
	<b>#788 1987</b>	<b>#940 1992</b>	<b>#988 1993</b>	<b>#1232 1998</b>	<b>#1326 2000</b>	<b>#1508 2003</b>	<b>#1591 2005</b>	<b>#1693 2007</b>
Hallowell	31,791	16,576	1,842	2,360	0	1,261	3,412	29,488
Litchfield	2,783	4,201	0	36,680	0	25,711	14,993	0
Manchester	3,196	4,318	0	9,859	0	49,911	86,227	111,234
Monmouth	4,692	8,170	0	4,925	0	24,606	42,508	22,827
Mt Vernon	5,285	13,817	3,143	43,549	33,642	28,223	65,610	154,539
Oakland	6,358	3,178	0	0	0	0	0	0
Pittston	0	3,391	1,735	19,336	2,485	12,446	15,079	0
Randolph	8,055	0	12,476	0	0	0	0	0
Readfield	4,860	7,543	0	27,806	0	30,774	224,803	119,886
Rome	1,298	4,134	0	0	2,521	0	17,653	28,762
Sidney	5,115	619	0	0	0	14,615	39,286	0
Vassalboro	12,654	14,238	3,639	0	0	5,481	20,072	0
Vienna	18,673	35,571	18,922	0	10,807	36,984	143,874	164,328
Waterville	29,245	4,011	0	0	0	0	0	0
Wayne	12,010	3,088	0	0	0	14,064	11,322	115,502
W. Gardiner	0	0	0	0	0	0	0	0
Windsor	5,507	7,245	0	0	0	0	66,990	4,576
Winslow	390,064	4,749	0	249,407	0	0	10,914	0
Winthrop	4,147	10,792	1,971	8,905	0	19,949	100,586	13,847
<b>Total</b>	<b>\$987,893</b>	<b>272,500</b>	<b>144,747</b>	<b>499,249</b>	<b>104,719</b>	<b>335,469</b>	<b>2,441,518</b>	<b>1,621,049</b>

**Probability of Occurrence**

Floods are described in local flood hazard studies in terms of their extent, including the horizontal area affected, and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different extents of flooding. The most widely adopted design and regulatory standard for floods in the United States is the 1-percent annual chance flood and this is the standard formally adopted by FEMA. The 1-percent annual flood, also known as the base flood, has a 1 percent chance of happening in any particular year. It is also referred to as the “100-year flood.” The probability of flooding of homes, commercial and governmental buildings and critical facilities located in flood-prone areas is 1% in any given year.

**SEVERE WINTER STORMS**

**Introduction**

Kennebec County is subject to severe winter storms in the form of major snowfall events and severe ice storms. The county experienced a severe ice storm in January 1998, which affected every town in the county. The entire County is also susceptible to “Northeaster” storms, especially from the very high winds that are involved in such a storm.

## Kennebec County Hazard Mitigation Plan – 2021 Update

The Gulf Stream follows a path up the eastern seaboard bringing major storms with it to the Gulf of Maine. Air streams containing much colder air flow down from Canada and collide with the Gulf Stream over the New England region. There have been five Federally-declared winter storm disaster events in the last 17 years. The worst storm in the past decade occurred in January 1998 and caused \$4.9 million in damage throughout the entire County. This storm, which nearly destroyed the electrical transmission system in the State of Maine, caused major damage to the forests, covered many roadways with debris and ice, and caused some limited building damages. However, most winter storms in the County are major snow storms which over-task the highway snow removal operations and cause localized power outages.

Severe winter weather conditions are characterized by low temperatures, strong winds, and often large quantities of snow.

### Types of Winter Storms in Kennebec County

- **Blizzard.** Sustained winds of 40 miles per hour (mph) or more or gusting up to at least 50 mph with heavy falling or blowing snow, persisting for one hour or more, temperatures of ten degrees Fahrenheit or colder and potentially life- threatening traveling conditions.
- **Heavy Snow Storm.** A snowfall of fifteen inches or more within 12 to 24 hours with sustained winds of less than 40 miles per hour which disrupts or slows transportation systems and public safety departments' response capability.
- **Ice Storms.** Rain which freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires, and similar objects and to produce widespread power outage.
- **Nor'easter.** Nor'easters are extra-tropical coastal storms that can produce tremendous amounts of precipitation and strong winds that can cause coastal flooding damage. When the precipitation is in the form of snow, sleet or freezing rain, it can damage overhead utility lines and become a highway driving hazard.
- **Sleet Storm.** Frozen rain drops (ice pellets) which bounce when hitting the ground or other objects. Does not stick to objects, but in accumulated depths of two inches or more, produces hazardous driving conditions.

### Location of Hazard

The entire County is subject to severe storms every winter, but there have been a number of storms that have been worse than others.

**Location of Severe Municipal Winter Storm Impact Areas.** The following is a summary of areas that are susceptible to severe winter storms, as identified in returns from the Kennebec County Hazard Mitigation Survey in 2020 and follow up surveys in 2021..

- **Albion:** Most damage from severe storms occurs because of trees coming down onto power lines and into roadways. We have many areas where trees are heavy along the roadways.

## Kennebec County Hazard Mitigation Plan – 2021 Update

- **Greater Augusta Utility District:** Design basis threat for GAUD is an ice storm where nearly all power is out and it is difficult to reach remote areas due to ice. Since 1998 we have mitigated a lot of sites but not all sites have generators but all sites are pre-wired and ready to accept portable wheeled generators (e.g. large double axle diesel generators, 100 kW etc)
- **Augusta:** Kennebec River runs through the City so both sides of the river are susceptible to ice jams with the impact being more severe on the west side where the buildings are affected. Whole City is impacted with big winter storms.
- **Belgrade:** Ice jams are most likely to occur at Belgrade's three dams in its village, on Salmon Lake and on the Belgrade Stream along Wings Mills Road. Some hills, particularly on the Knowle, Minot Hill, West and Horse Point roads.
- **Benton:** All land area Kennebec River and Sabasticook River
- **Chelsea:** Town wide but including Butternut Park and possibility of the Intervale Rd along the Kennebec River
- **China-** None known at this time
- **Clinton-** All streets in town
- **Hallowell:** Kennebec River
- **Monmouth:** The only major ice dam issue is on Jug Stream which flows from Anabessacook Lake into Cobbossee Lake at the East Monmouth dam. Drifting snow is very problematic on the following roadways: Routes 132 (Main Street) and 135, Cobbossee, Ridge and Norris Hill Roads. Downed trees and power lines from snow/ice storms are always an issue, which is widespread.
- **Oakland:** Winter Storms, down wires
- **Sidney:** West River Rd. severe drifting due to several open fields.
- **Waterville-** The City of Waterville borders the Kennebec River, which is known to be susceptible to ice jams. None have caused catastrophic failure at this time.
- **Wayne:** Our whole community is susceptible to severe winter storms. Heavy snow/ ice storms take down trees frequently causing long duration power outages.
- **Winslow:** Some of the hilly streets such as Halifax Street and Clinton Avenue become difficult to maintain during heavy snow. China Road west of Reynolds Road becomes an issue during heavy snow due to MDOT's difficulty keeping up with the snowfall. Garland and Albion Roads experience drifting during windy events, as does Taylor and Maple Ridge Roads.

**Windsor(2015):** Choate Road Bridge, Maxcy's Mill Road, Sampson Road, Shuman Road, Weeks Mills Road, Wingood Road

### **Extent of the Hazard**

During the winter months, Kennebec County often has heavy snowfall, or snow combined with high winds, freezing rain or ice storms. Nor'easters, the most severe form, occur during the winter, spring and fall. They rarely develop during the summer. Precipitation amounts can exceed several inches of water equivalent (20-30 inches of snow or more), while wind speeds can be equal to or greater than those for hurricanes that reach Maine. Loss of electrical power and communication services can occur when utility lines yield under the weight of ice and snow. These conditions can impede the response time of ambulance, fire, police and other emergency services, especially to remote or isolated residents.

## Kennebec County Hazard Mitigation Plan – 2021 Update

Average seasonal snowfall amounts generally increase in the interior parts of the County. Total seasonal snowfall ranges between 50 and 80 inches in the very southern parts of the County, to 60 to 90 inches in the rest of the County. Higher snowfall totals may be found locally.

The snowfall season usually runs from late October (in the north) or November (most of the rest of the County) to April and sometimes into May. Occasionally an early season storm can bring snow in the first weeks of October. January is usually the snowiest month throughout the State with many stations averaging over 20 inches of snow in that month with December usually averaging out to be the second snowiest month. The snowpack makes an important contribution to both surface and groundwater supplies, and years with a low snowpack can lead to water shortages by late summer. Melting of the snowpack in April and May is often gradual enough to prevent serious flooding, although there have been times when a quick melt has led to disastrous conditions.

### Previous Occurrences

The following is a summary of some of the most severe winter storms in Kennebec County during the past 40 years.

**Key:** DR: Disaster Declaration  
EM: Emergency Declaration

<b>Historical summary of Major Winter Storm Events in Kennebec County Since 1970</b>			
<b>Year</b>	<b>Month</b>	<b>General Description</b>	<b>Presidential Declaration #</b>
1978	Jan 10	Rain/snow/ice	n.a.
1978	Mar 15	Ice jams and heavy rains	State Aid
1993	Mar 13, 14	Blizzard	FEMA 3099-EM
1996	Jan 12-13	Heavy snowfall following a previous storm collapsed the roofs of several buildings, including the Litchfield Fairground arena, crushing farm equipment and antique vehicles.	None
1998	Jan 5-25	“Great Ice Storm of ‘98”	FEMA 1198-DR
2003	12/17/02 to 6/1/03	Extreme winter weather; severe cold and frost	FEMA 1468-DR
2003	Dec 6-7	Snow, winter storms and extreme cold	FEMA 3190-DR
2005	2/10-11	Snow, winter storms and extreme cold	FEMA 3206-DR
2008	Dec 11-12	Major winter storm with snow, sleet, freezing rain. Up to an inch ice accretion on branches and wires led to many downed power lines and poles.	None
2013	Dec 21-26	Severe ice storm caused extended power outages accompanied by the polar vortex. It kept sub-freezing conditions, also resulting in frozen pipes	Denied

## Kennebec County Hazard Mitigation Plan – 2021 Update

		and water damages to homes and businesses.	
2017	Oct-Nov 17	Heavy rain, flooding, and a prolonged period of high winds caused severe damage to critical infrastructure for several days.	FEMA-4354-DR
2018	Mar 13-14	Heavy snow and blizzard conditions	None
2019	Dec 2-3	Heavy snow	None

Source: FEMA Declared Disasters, NWS Storm Events Database

To date, the storm of record is the ice storm of January, 1998, which caused over \$4.9 million in damages throughout the County. Below freezing temperatures, combined with record rainfall, contributed to a blanket of solid ice throughout central Maine. In some places, more than three inches of ice coated the rural and urban landscape. At its peak, many areas in Kennebec County were without power, caused by ice that coated lines and branches an inch thick. Most State government offices were closed, and innumerable businesses were forced to close and remain closed because of blocked roadways and power outages.

The following table provides a town-by-town summary of damages resulting from the ice storm of 1998.

<b>Ice Storm of January, 1998 Town-by-Town Summary of Damages</b>	
<b>Town/City</b>	<b>Damages</b>
Albion	\$147,879
Augusta	1,047,776
Belgrade	93,862
Benton	48,266
Chelsea	83,867
China	287,829
Clinton	57,647
Farmingdale	180,833
Fayette	129,584
Gardiner	260,312
Hallowell	104,077
Litchfield	122,421
Manchester	181,796
Monmouth	193,296
Mt Vernon	188,663
Oakland	126,968
Pittston	66,543
Randolph	35,620
Readfield	183,139
Rome	37,532
Sidney	116,820
Vassalboro	121,873



## Kennebec County Hazard Mitigation Plan – 2021 Update

Vienna	27,401
Waterville	420,068
Wayne	80,446
W. Gardiner	91,306
Windsor	89,544
Winslow	205,984
Winthrop	212,879
<b>Total</b>	<b>\$4,944,231.00</b>

At the end of October in 2017, the state of Maine experienced a severe windstorm that caused massive power outages and flooding. A “bomb cyclone” from leftover tropic moisture from Tropical Storm Philippe began to feed into a cold front creating this unique weather event. The strong winds, measured in upwards of 60 mph in some areas, led to many trees falling bringing power lines down as well. Many trees also snapped over 1,400 power poles throughout the state which led to more delays in restoring power. This storm also surpassed the total number of people without power from the Ice Storm of 98 with 467,000. There were many people in rural parts that were without power for more than five days. Some were not able to travel due to the large number of trees blocking roads. Gov. LePage requested a disaster declaration due to the widespread damage and was granted in 2018.

Ice jams along the Kennebec River continue to be a serious problem with the potential for significant flooding. During the winter of 2010, a large ice jam formed in Augusta, causing a 10 to 15 foot rise in the level of the river in about a half hour. Weeks later, the ice jam broke loose and reformed in Hallowell. Later, the ice jam reformed in Farmingdale and Gardiner. During the entire time the various ice jams were in place, officials from the Kennebec County Emergency Management Agency met with community leaders, businesses and interested citizens in Augusta, Hallowell, Farmingdale and Gardiner to advise them of the flooding dangers caused by the ice jam and to urge that safety precautions be taken (such as chaining LP tanks to buildings). Officials from the Cold Regions Research and Engineering Laboratory (CRREL) studied the ice jam and advised EMA officials on potential courses of action. In response to suggestions from some members of the public that officials blow up the ice jam, officials from CRREL advised against that course of action because of the expense and the potential for doing more harm than good. In December of 2018, an unexpected ice jam formed over a weekend where there was warm temperatures and rain followed by a rapid drop to below freezing temperatures. The ice jam caused the Kennebec to surge to 19.58 feet in Augusta and Hallowell in a very short time which led to approximately \$75,000 worth of damages to vehicles and businesses along Front Street in Hallowell. In general, the municipalities along the Kennebec, Maine experienced a very warm spring with no major storms, so the ice jam melted and broke loose on its own.

### **Probability of Occurrence**

In previous plans, it was expected that that severe winter storms would cause severe damages once every three years. In the past few years, Kennebec County is seeing a shift from weather events with large amounts of snow to weather events with rain and prolonged periods of high winds. These weather events are leading to more instances where trees are damaging power lines, road access, and property. Climate models continue to suggest that Maine is likely to get

more ice storms in the future due to warmer temperatures. However, if colder temperatures prevail, the precipitation will be in the form of snow, as was the case in the record-breaking “snow year” of 2014-2015 that blanketed the northeast.

## **WILDFIRE**

### **Introduction**

All parts of the County could be subject to wildfires. However, the most northern portion of the county has the least accessibility to the productive forestland due to a lack of roads and development. In comparison, the central and southern portion of the County has a larger number of homes and businesses within the urban-wildland interface.

**Types of Wildfires in Kennebec County.** A wildfire is a fire that burns vegetative cover such as grass, timber or slash. Wildfire is a natural phenomenon initially finding its origin in lightning. However, humans have become the greatest cause of wildfires in Kennebec County. There are two types of wildfires:

- Wildland fires are defined as those fires that burn vegetative cover: grass, brush, timber, or slash;
- Wildland urban interface fires are created where homes meet with highly volatile forest fuels.

### **Location of Hazard**

The Department of Conservation, Maine Forest Service Forest Protection Division tracks all reported fire occurrences in the State on an annual basis. These are coded by cause: campfire, children, debris burning – which can include backyard burning as well as the agricultural practice of “burning over” blueberry fields, incendiary (includes arson), lightning, machinery, miscellaneous, railroad and smoking.

**Location of Wildfire Impact Areas.** The following is a summary of areas that could be susceptible to wildfires, as identified in the Kennebec County Hazard Mitigation Planning Municipal Survey 2015.

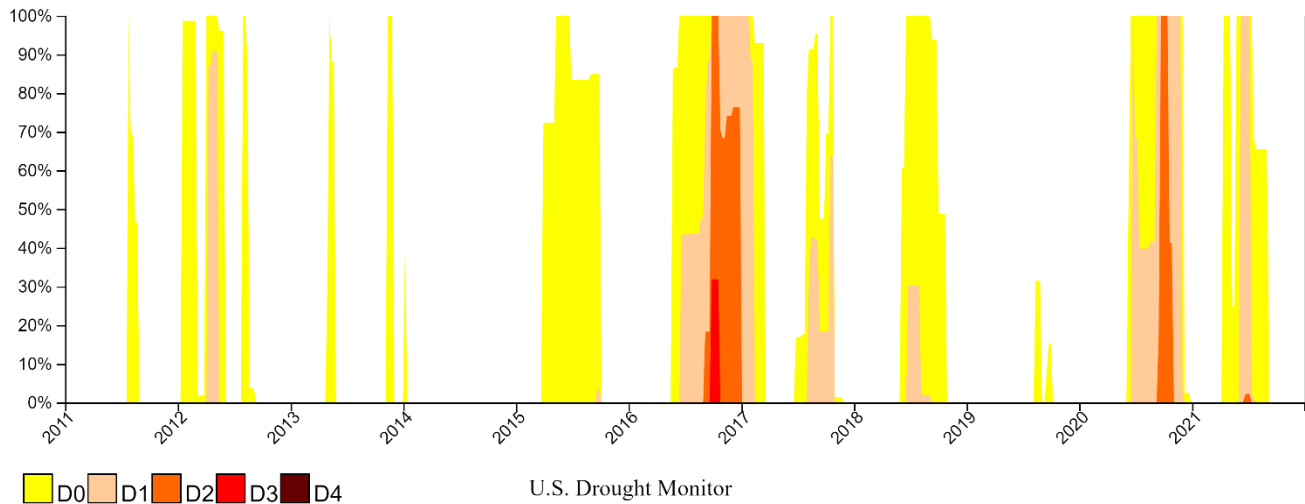
- **Albion:** The Bog Road area, areas around Lovejoy Pond, Pond Road, Abbott Road, Clark Road, and the Quaker Hill Road are at higher risk for structure damage due to a wildland fire. There are many camps and houses within the wooded areas. There are many more isolated areas in Town at risk.
- **Belgrade:** Belgrade is a rural, heavily wooded area that, depending upon conditions, could be a tinderbox. It sits at the base of the Kennebec Highlands, most of which is in conservation. Logging remains a significant industry here, which helps to control tree growth.
- **Benton:** All
- **Chelsea:** Town wide
- **China:** None known at this time
- **Clinton:** Area the train tracks go through

## Kennebec County Hazard Mitigation Plan – 2021 Update

- **Hallowell:** The western part of the City, generally west of Interstate 95.
- **Manchester(2015):** Summer Haven area by gravel pits.
- **Monmouth:** Wildland fires are always a threat, especially with dense woods and farm land in our area. A railroad runs through the center of our town, which has sparked fires in the past. We also have a lot of seasonal residents. There are approximately 100 miles of camp roads that have seasonal and year-round dwellings on five bodies of water – Cochnewagan, Wilson, Cobbossee, Annabessacook and Tacoma Lakes. The Maine Forest Service conducted a wildfire/urban interface improvement plan on Tacoma Lake near Chipmunk a few years ago, which has slightly improved that area.
- **Oakland:** Railroad corridor
- **Sidney:** Most of the town as it is mostly field and wood.
- **Waterville:** Quarry Road, Devils Chair Rockface
- **Readfield(2015):** The town has a railroad track that has in the past caused wildfires due to railroad faulty equipment.
- **Wayne:** Much of Wayne is forested and susceptible to wildfire. Wayne is a member of the Lakes Region Mutual Aid Group and works closely with Maine Forest Service to respond to wildfire and mitigate property damage.

### Extent of the Hazard

Kennebec County could be subject to large multi-acer wildfires if it were to experience several years of severe drought. According to NOAA and the National Integrated Drought Information System, Kennebec County has seen severe drought or worse in 2002, 2016, 2020, and 2021. Kennebec County has seen an increasing of periods or abnormally dry and moderate drought conditions over the past ten years<sup>5</sup>.

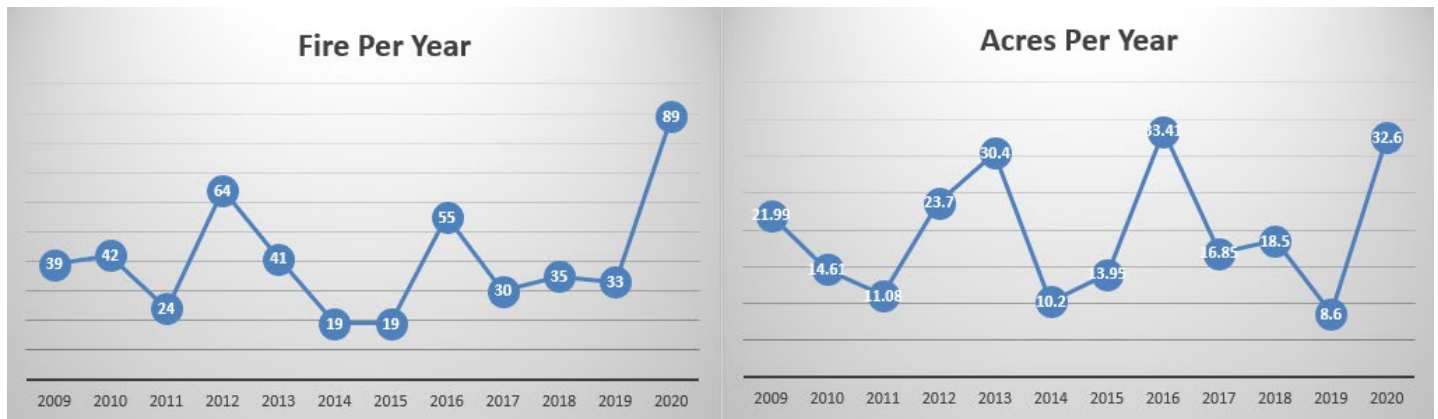


Graph from National Integrated Drought Information System website

<sup>5</sup> U.S. Drought Monitor timeseries: <https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx>

## Kennebec County Hazard Mitigation Plan – 2021 Update

Nearly 75% of the County is forest land and the accessibility by vehicle to some areas is limited. The likelihood of a severe wildfire is low, but the impact would be high because of potential damages to homes located in wooded areas. A wildfire in October 1825 burned 3,000,000 acres in Maine and New Brunswick. The most severe wildland fire wildfire in the State's recent history occurred in October of 1947. This fire burned 205,678 acres and caused 16 deaths. However, most of the damages were confined to Cumberland, Hancock, Oxford and York Counties. Recently, Kennebec County has not seen pattern of increasing or decreasing fires throughout the past ten years. Based on data collected from the Maine Forrest Service, there is also not a correlation on the number of fires and the number of acers burned. However, in times of drought or severe drought there will be more fires.



Data from Maine Forest Service Dept. of Protection

### Previous Occurrences

Based on information obtained from the Maine Forest Service, there have been no major fires in Kennebec County in recent years. All of the wildfires known to have occurred were confined to relatively small land areas, usually an acre or less.

Historically, forest fires were one of the State's most significant hazards, and Maine averages about 600-700 low acreage forest fires annually. In 2020, there were 1,150 fires that had burned 1,030 acres while in 2019 there were 359 forest fires with 142 acres burned. Today, about 90% of all forest fires are caused by human activity while lightning causes about 10% (One to two fires a year in Kennebec County). Most common sources of human activity are the burning debris, campfires, or miscellaneous (i.e., improper disposal of stove ashes or fire started from shooting of firearms). During dry periods, the fire danger increases rapidly.

### Probability of Occurrence

Although a severe wildfire is possible, it is more probable that Kennebec County will continue to see a large majority of small wildfires in the urban-wildland interface. As most wildland fires have human causes, the majority of fires will be located in areas where most fire departments can quickly respond and aggressively protect property from being damaged. However, one factor that may have consequences to wildfire growth is the decreasing number of volunteer firefighters. Given that the majority of Kennebec County is made up of Volunteer Firefighters,

a decrease in the number of volunteer firefighters may lead to delayed response times and could cause wildland fires to grow larger in size. Since Kennebec County experiences more frequent and intense drought periods, wildland fire could potentially be more frequent as well.

## SEVERE SUMMER STORMS

### Introduction

Severe summer storms and hurricanes can have an immediate impact on flooding, primarily as a result of heavy downpours.

**Types of Severe Summer Weather Events in Kennebec County:** A severe summer weather event is a violent weather phenomenon producing winds, heavy rains, lightning, and hail that can cause injuries and destruction of property, crops and livestock. There are several different types of summer weather events that can occur in Kennebec County:

- **Hurricane:** An intense, tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center called the “eye.”
- **Lightning:** An electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a “bolt.” This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling causes thunder.
- **Thunderstorm:** A storm formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm or cold front. All thunderstorms have lightning and can occur singly, in clusters or in lines.
- **Tornado:** A violently rotating column of air extending downward from a thunderstorm to the ground. The distinctive, slender, funnel shaped cloud, with wind velocities up to 300 miles per hour at the central core, destroys everything along its narrow ground path.
- **Microburst.** A small, extremely intense downdraft which descends to the ground creating strong wind divergence. Microbursts are typically limited to areas less than 2.5 miles across. This weather phenomenon is capable of producing damaging surface winds in excess of 100 mph. Generally, a microburst event will last no longer than 15 minutes.

Kennebec County is subject to summer storms. During summer months, southwest to southerly winds become quite prevalent. When severe summer storms arrive, high winds can fell trees and branches onto power lines, causing power and communication outages. Heavy rains that often accompany thunderstorms can result in flash flooding or erosion. Lightning strikes can start fires. Any of these weather events can cause personal injury or property damage. The impact of summer storms in Kennebec County is usually restricted to flooding and erosion caused by the large amounts of moisture these storms can carry, as well as downed power lines and tree branches.

## Location of Hazard

All of Kennebec County is vulnerable to one or more severe summer storms each year, usually in the form of thunderstorms. The following is a summary of areas that are susceptible to severe summer storms, as identified in returns from the Kennebec County Hazard Mitigation Survey 2021.

- **Albion:** Most damage from severe storms occurs because of trees coming down onto power lines and into roadways. We have many areas where trees are heavy along the roadways.
- **Greater Augusta Utility District:** Same issues as ice storms – lots of downed lines / difficult to quickly reach remote sites
- **Augusta:** Entire City with the country roads and people living on remote private roads most susceptible
- **Belgrade:** Belgrade's village is most densely populated in a wooded area between Long and Great ponds. A recent microburst left some impressive destruction that left some without power for about a day. Power outages are not uncommon in Belgrade during severe weather, owing partly to it being a rural, heavily wooded area.
- **Benton:** All
- **Chelsea:** Town wide but especially town roads such as Hallowell Rd, Windsor Rd, Townhouse Rd and Hankerson Rd. Nelson Rd is especially bad due to its location and being a dead-end road often is affected by rain and wind storms.
- **China:** Clark Road, gravel road, wash outs
- **Clinton:** All streets in town
- **Hallowell:** Entire City, but especially the Downtown area.
- **Monmouth:** Summer storms are usually widespread with downed trees and power lines. There are no isolated areas that experience more damage than others. The utility company has done a great job in the past few years pruning back trees from power lines.
- **Oakland:** Town wide, lakefront property
- **Sidney:** The whole town is typically affected.
- **Waterville:** The City of Waterville is susceptible to severe storms. During microburst conditions is it not uncommon to yield 60 – 80 calls for service for trees and lines down.
- **Wayne:** Our whole community is susceptible to severe summer storms. Heavy rains and windstorms take down trees frequently causing long duration power outages and washing out roadsides. Le. House Road, Hardscrabble Road, Dexter Pond Roads
- **Windsor(2015):** Choate Road, Legion Park Road, Wingood Road, Weeks Mills Road, Barton Road, Jones Road, Erskine Road, Coopers Mills Road, Maxcy's Mills Road, Shuman Road, Windsor Neck Road, Reed Road, Graley Road, Sampson Road, Hunts Road, Meadow Road, Doyle Road.
- **Winslow:** We have two areas that experience repeated street flooding during heavy rain events. China Road in the area of Bay Street because the drainage pipe that carries a stream across the McDonalds property is undersized and gets overwhelmed and runs out to the China Road and overflows the drainage system. The second area is on Robert Street that has an under sized drainage system.

## Extent of the Hazard

The most potentially damaging types of summer storms in Kennebec County would be F1 or greater tornados, microbursts with winds in excess of 100 miles per hour, thunderstorms of more than an inch of rain per hour that can wash out roads and result in flash flooding, or an

Kennebec County Hazard Mitigation Plan – 2021 Update

actual hurricane strike that could cause deaths as well as structural damages. The table below provides information on various categories of tornados.

**The Fujita Tornado Scale (abbreviated)**

Maximum Wind Speeds	Tornado Category	Equivalent Saffir-Simpson Scale (for hurricanes)	Typical Effects
40-72 mph	F0	NA	Gale tornado; light damage to chimneys; breaks twigs and branches off trees; pushes over shallow-rooted trees; damages signboards; some windows broken.
73-112 mph	F1	Cat 1/2/3	Moderate tornado. Moderate damage: peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off roads; trees snapped or broken.
113-157 mph	F2	Cat 3/4/5	Significant tornado; considerable damage: roofs torn off frame houses; mobile homes demolished; frame houses with weak foundations lifted and moved; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
158-206 mph	F3	Cat 5	Severe tornado; severe damage: roofs and some walls torn off well-constructed houses; trains overturned; most trees in forests uprooted; heavy cars lifted off the ground and thrown; weak pavement blown off roads.
207-260 mph	F4	NA	Devastating tornado; devastating damage: well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and disintegrated; large missiles generated; trees in forest uprooted and carried some distance away.

**Previous Occurrences**

The following table summarizes the occurrences and estimated damages of hurricanes in Kennebec County going back to 1954. Historically, of all Maine’s natural hazards, hurricanes are the most likely to cause deaths. The impact would vary widely, depending on whether it struck a rural or urban population.

<b>Historical Summary of Hurricanes and severe summer storms in Kennebec County</b>					
Year	Month	Day	Statewide Estimated Damage	Type of Damage	Declaration
1954 “Edna”	Sept	11	Statewide - \$7 million,	Statewide - 8 deaths, power outages	Presidential #24
1962 “Ginny”	Oct	29	Statewide – unknown	-	-
1985 “Gloria”	Sept	17	Androscoggin, Cumberland, Franklin, Kennebec, Somerset, York	Statewide – 3 injuries, downed trees, power failures up to 14 days,	-

Kennebec County Hazard Mitigation Plan – 2021 Update

			- \$ unknown	250,000 people affected	
1991 "Bob"	Sept	10	Androscoggin, Cumberland, Franklin, Kennebec, Sagadahoc, York - \$5,523,665	3 deaths, power outages	Presidential FEMA-DR-915-ME
1999	Sept	16-19	Androscoggin, Cumberland, Kennebec, Oxford, Somerset - \$1,210,205	Power outages; downed trees	Presidential FEMA-DR-1308-ME
2012	October	29-30	Remnants of Hurricane Sandy, high peak gust winds and heavy rain – \$unknown	Power outages	-
2017	Oct	30	Very strong winds and heavy rain in central and southern Maine – \$9.5 million	Power outages, downed trees	DR-4367
2018	August	17	Thunderstorms	Wind damage	-
2020	July	8	Numerous strong to severe thunderstorms	Downed trees, power lines	-
2021	June	30	Thunderstorm winds	Downed trees, power outages, property damages	-

Source: FEMA Declared Disasters database, NWS Storm Events Database

Unlike the other hazards, summer storms do not have a table of occurrence other than the most severe form, hurricanes, as shown in the table above. However, based on information obtained from the NOAA website, Kennebec County has experienced two F2 tornadoes. One occurred on July 31, 1971, and the second occurred on July 8, 1996. According to the website, there have been no F3 or greater tornados reported in Maine.

**Probability of Occurrence**

There have been no probability studies to indicate the frequency of summer storms. However, Kennebec County’s location in the northeast, and its long experience with summer storms, indicate that each summer, such storms will occur. Like severe winter storms, Kennebec County has continued to see a shift in the frequency and intensity of summer storms. Many severe storms continue to be accompanied by severe precipitations and high winds that cause damage to trees, powerlines, and blocking roads. The locations where such storms are the most intense will vary from year to year. The most severe forms of summer storms, hurricanes, and tornadoes, occur very infrequently in Kennebec County but microburst and severe thunderstorms could increase in frequency.

<b>Assessing Vulnerability: Overview</b>
<b>Requirement §201.6(c)(2)(ii):</b> (The risk assessment shall include a) description of the



<p>jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:</p> <ul style="list-style-type: none"> <li>A. The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;</li> <li>B. An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;</li> <li>C. Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions</li> </ul>	
<b>Elements</b>	B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction?
	B4. Does the Plan address NFIP insured structures within each jurisdiction that have been repetitively damaged by floods?
	D1. Was the plan revised to reflect changes in development?

**Vulnerability of Kennebec County to Each Hazard**

**Flooding.** Some of the County’s most serious flooding has been in areas where there are residential and/or commercial structures including downtown business districts in Augusta, Hallowell and Gardiner. With the exception of the aforementioned areas, most of the developed areas in Kennebec County are located outside of designated flood plains, and are thus not very vulnerable to flooding. On the other hand, many parts of the County are very rural in nature, and are served by a network of rural roads that do not have proper storm drainage systems. These roads are very vulnerable to flooding caused by heavy downpours and/or the blockage of drainage systems by ice or debris, even though these roads may not be in an identified flood plain.

**Severe Winter storms.** Kennebec County’s location in Northern New England places it in a high-risk area for winter storms. While the majority of winter storms in Kennebec County occur during the winter season of December through March, there are occasional winter storms in the late fall (November and early December) and in the Spring (March – April). However, the severity of storms is typically most serious in January and February, with storms in the earlier and later parts of the seasons usually being of lesser magnitudes.

The time of day at which storms occur is also important, as overnight storms allow for the closure of schools and businesses, whereas storms during the day force people to travel home during storm conditions. Based on past experience, storms are most likely to occur overnight or during the morning, but afternoon storms are still somewhat likely.

A major winter storm of the severity that occurred in 1998 would impact nearly all of Kennebec County and threaten the overhead electric and communication lines. Roads may be closed due to wash outs and debris in roads from trees and utility lines.

## Kennebec County Hazard Mitigation Plan – 2021 Update

As noted earlier in this Assessment, Kennebec County has been included in a number of Presidential Disaster Declarations for winter storms. Kennebec County contains at-risk populations that could be impacted by a major winter storm.

**Wildfires.** Kennebec County is heavily forested, and is vulnerable to forest fires. However, all of the organized municipalities in Kennebec County are served by capable fire departments. The Maine Forest Service has been very active in forest fire prevention activities, and, through meetings convened by the Kennebec County Emergency Management Agency, meets periodically with municipal fire chiefs on matters related to wildfire prevention and response activities.

**Severe Summer Storms.** The entire County is vulnerable to thunderstorms, microbursts, and high winds associated with changing weather systems or fronts. During the summer months, southwest to southerly winds are prevalent in the County. Severe high winds generally drop trees and branches onto power lines, causing power and communication outages. Heavy rains usually result in flash flooding or erosion. Hail can damage crops and property. As previously noted, there have been more occurrences of severe summer storms in recent years.

### Impacts of Each Hazard on Kennebec County

**Flooding.** In addition to damages to residential and commercial structures in some locations, including downtown areas in Augusta, Hallowell and Gardiner, the typical damages resulting from flooding in Kennebec County include damages to roads and their respective drainage systems. Historically, flood damages have included partial or complete road washouts, as well as severe erosion of roadside ditches, resulting in hazards to motorists if their vehicles go off the road. In some cases, entire communities have been partly or completely isolated because the only road serving the town has been damaged by floods.

**Winter storms.** The impacts of severe winter storms include road closures (and the subsequent inability of emergency vehicles to provide help), the loss of power for extended periods of time, high costs to local governments for snow removal efforts, and loss of income to businesses and individuals due to business closures. Roof collapses, both residential and commercial, are rare but they can occur when snow loads become extreme.

**Wildfires.** The primary impacts include damages to homes located in the wildland-urban interface and loss of valuable timberland. A larger percentage of homes in rural municipalities are located in the wildland-urban interface than homes in village areas. The northern part of the County includes vast tracts of forestland that could be damaged by wildfires.

**Severe Summer Storms.** The damages from severe summer storms typically involve the washout of roads, downed utility lines and debris clearance. If severe enough, this could result in the loss of income to businesses and individuals due to business closures.

### Repetitive Loss Properties

The following table is a summary of repetitive loss properties in Kennebec County. Privacy laws prohibit reporting any more information than is shown below. The National flood Insurance Program (NFIP) definition of a repetitive loss property is any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period since 1978. Jurisdictions with no repetitive loss structures are not listed in this table.

<b>Kennebec County Repetitive Loss Properties</b>				
<b>Town/City</b>	<b>Residential Structures</b>		<b>Non-Residential Structures</b>	
	<b># Properties</b>	<b># Losses</b>	<b># Properties</b>	<b># Losses</b>
Augusta	1	3	5	22
Gardiner	1	2	5	15
Hallowell	0	0	7	22
Wayne	3	7	0	0
Winslow	2	5	2	5

Source: NFIP, Maine Floodplain Management Program

### Identifying Structures

The Hazard Mitigation Planning Team identified existing buildings, infrastructure, and critical facilities located within the County and the hazards to which these facilities are susceptible.

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 County, or fulfills important public safety, emergency response, and/or disaster recovery functions.

The critical facilities identified in Kennebec County are municipal offices, fire and police stations, post offices, town garages and sand/salt sheds, hospitals and clinics; electric and communication utilities; water and wastewater treatment facilities; hazardous material sites; and schools that have been inventoried as shelters.

### Vulnerability of existing buildings, infrastructure and critical facilities

#### Flooding

- **Buildings.** Some of the County’s most serious flooding has been in areas where there are residential and/or commercial structures including the downtown areas of Augusta, Hallowell and Gardiner.
- **Infrastructure.** Roads and their associated storm drainage systems are the most vulnerable category of infrastructure. Many parts of the County are rural in nature, and are served by a network of rural roads that do not have proper storm drainage systems. These roads are very vulnerable to flooding caused by heavy

downpours and/or the blockage of drainage systems by ice or debris. The most widespread flooding damages in Kennebec County are damages to local roads.

- **Critical facilities.** A 100-year flood could have an impact on five post offices, three water pump stations, two libraries, one waste water pump station, one fire station, and one public works facility. The majority of these would only involve damage to the basements or several feet on the first floor. During the Flood of 1987, which was considered to be a 500 year flood event, there was considerable damage but no public buildings were completely destroyed.

### Severe Winter Storms

- **Buildings.** All buildings in Kennebec County are vulnerable to winter storms. Damages can include burst water pipes during power outages, interior water damages due to ice dams forming on roofs, and occasionally, roof collapses due to heavy snow loads.
- **Infrastructure.** A “Northeaster”, blizzard or ice storm of the severity that occurs at least once every 3-5 years would have an impact on all roads in the County and on all overhead electrical power and telephone lines. Roads may be covered in snow, washed out, or blocked with tree debris. Utility lines and poles may be felled.
- **Critical facilities.** No critical structures were identified as being in danger from a severe winter storm.

### Wildfires

- **Buildings.** Forest fires would have a tremendous impact on the large number of homes located in the wildland-urban interface. We estimated that over 15,130 homes or 26.8% of the homes in Kennebec County are located in the wildland-urban interface.
- **Infrastructure.** Power, phone and cable lines can be damaged during a wildfire. Roads and their storm drainage systems are much less vulnerable, although road access to certain areas can be blocked by fires and by emergency fire-fighting vehicles.
- **Critical facilities.** Wildfires in Kennebec County have tended to be relatively small, and have not been a threat to critical facilities. In the event of a very large wildfire, some critical facilities could be damaged by fire and smoke.

### Severe Summer Storms

- **Buildings.** All buildings in Kennebec County are vulnerable to summer storms. Damages can include debris like tree limbs; and from high winds, interior water damages due to wind-driven heavy rain.
- **Infrastructure.** Roads and their associated storm drainage systems are the most vulnerable category of infrastructure. They can become temporarily blocked due to heavy rain and debris over a short period.

## Kennebec County Hazard Mitigation Plan – 2021 Update

- **Critical facilities.** All critical facilities in Kennebec County are vulnerable to summer storms in the same manner that individual buildings are vulnerable. However, some of the critical facilities throughout the County have back-up generator systems, which allow building systems to continue operating during a power outage.

In addition to critical facilities, Kennebec County contains at risk populations that should be factored into a vulnerability assessment. These include a relatively large population of elderly residents who live alone in very rural areas and who have limited mobility.

**Facility Types.** The following chart identifies the type and number of critical facilities in each town in Kennebec County.

Kennebec County Hazard Mitigation Plan – 2021 Update

**County Asset Inventory by Municipality**

Town	Municipal Office	Fire/EMS Station	Police Station	Post Office	Public Works	Water Treat/Storage	Wastewater Treatment Library	School	Power Plant	Hospital/Clinic	Communication Tower	Airport	Hazmat Facility	
Albion	1	1		1	x		1	1		1				
Augusta	1	6	4	2	2	4	1	4	8	3	3	1	18	
Belgrade	1	3		2			1	2			1		2	
Benton	1					1		1	1				1	
Chelsea	1	3	1			1	1	3			2			
China	1	3		2			1	3			1			
Clinton	1	1	1	1	3	1	1	1			1		1	
Farmingdale	1	2				1		1	x		4		1	
Fayette	1	1			1		1	1	x					
Gardiner	1	1	1	2	2	2	1	2	4	1	2		3	
Hallowell	1	1	1	1	2	2	2	1	1		1		4	
Litchfield	1	1		1	2			2			1		1	
Manchester	1	1		1		1		1			1		1	
Monmouth	1	2	1	2	3		2	3		1	1		1	
Mount Vernon	1	2		1	1		1	1						
Oakland	1	2	1	1	2		1	1	4		2		5	
Pittston	1	2				1		1			1			
Randolph	1	1			1	2					1			
Readfield	1	1		2	2		1	5					2	
Rome	1	2			1						1			
Sidney	1	3			2			2			2		1	
Unity Plantation													1	
Vassalboro	1	2		2	2	2	1	1	1	1	3		1	
Vienna	1	1		1										
Waterville	1	2	1	1	1	1	2	3	7	3		1	3	
Wayne	1	2		1			1	1						
West Gardiner	1	2			2	1		1			1			
Windsor	1	1		1	2		1	1						
Winslow	1	1	1	1	1		2	3					2	
Winthrop	1	1	1	2	2	2	2	1	3	1	2		2	
<b>TOTAL</b>	<b>29</b>	<b>51</b>	<b>13</b>	<b>28</b>	<b>34</b>	<b>22</b>	<b>12</b>	<b>26</b>	<b>62</b>	<b>2</b>	<b>11</b>	<b>31</b>	<b>2</b>	<b>50</b>

## Vulnerability of future buildings, infrastructure and critical facilities

Assessing where future development will occur in the municipalities in Kennebec County is difficult due to a lack of municipal data, policies and programs. Most of the Kennebec County municipalities are very small and rural and do not have planning departments, or a full time code enforcement officer. There is a moderate level of residential, commercial, industrial and public construction completed in most of these communities. As documented more fully in Section 6, there are a number of local plans and ordinances that will help reduce the vulnerability of future buildings, infrastructure and critical facilities to the hazards profiled in this Plan.

Beginning in December of 2010, a new, statewide building code went into effect. It is too early to predict whether or not this will have an impact on the vulnerability of future buildings and critical facilities.

In 2018, The Maine's State Economist has prepared population projections for the State and its counties to the year 2038<sup>6</sup>. Based on those projections, Kennebec County's population is expected to increase from 122,151 in 2010 to a projected population of 125,406 in 2038. Kennebec County also saw an increase in population from the 2020 Census and is projected to have an increase of 1.22% to 123,642 people.<sup>8</sup> Maine was also expected have a population increase from its 2010 population of 1,328,361 to a projected population of 1,371,608 in 2038<sup>7</sup>. The 2020 Census population is projected to increase 2.6%, to a total of 1,362,359 people.<sup>8</sup>

### Flooding

- **Buildings.** The majority of damages from flooding in Kennebec County is to roads, not structures. All county municipalities have floodplain ordinances that provide some control over new development in flood zones. In 1987, Kennebec County was hit with a greater than 100 year flood which caused significant flood damage to a number of buildings. Many of these buildings have been flood-proofed. All new development must meet NFIP requirements.
- **Infrastructure.** Future roads and their associated storm drainage systems would seem to be the most likely category of infrastructure that would be vulnerable to flooding. However, State and local road construction standards generally ensure that new roads are properly constructed with adequate storm drainage systems. Most if not all roads in the public domain must be designed by a registered professional engineer. Therefore, flooding of future roads is not likely to be a serious issue in Kennebec County.

**Critical facilities.** Because of the requirements of the Flood Insurance Program, as well as shoreland zoning requirements and a greater awareness of flooding in all communities, future critical facilities will continue to be located outside floodplain areas. The exception may be wastewater treatment plants, due to the need to locate these facilities at lower elevations.

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<sup>6</sup> State Economist county population projections: <https://www.maine.gov/dafs/economist/sites/maine.gov.dafs.economist/files/inline-files/MaineStateCountyPopulationProjections2038.pdf>

<sup>8</sup> Maine: 2020 Census, <https://www.census.gov/library/stories/state-by-state/maine-population-change-between-census-decade.html>

### Severe Winter storms

- **Buildings.** New buildings in Kennebec County should be less vulnerable to severe winter storms. Damages may include burst water pipes, but many newer buildings are better insulated than older ones, thus being better able to retain heat during longer periods of time when there is a power outage. There will be less interior water damage due to ice dams forming on roofs because the roofs of newer buildings generally are properly vented, which allows the roofs to remain cold. Roof collapses due to heavy snow loads will be very rare because newer roofs are required to be designed and built to withstand heavy snow loads. It is unlikely that a severe winter storm will have significant impacts on future structures. This hazard primarily impacts local roads and overhead utility lines.
- **Infrastructure.** Roads will continue to be the most vulnerable category of infrastructure. New roads can be just as easily blocked on a temporary basis due to heavy snowfall, ice building up on the road surface, and debris such as tree limbs accumulating on the road surface during a storm event. However, in the present economy, it is unlikely that Kennebec County will experience much new road construction, with the possible exception of small road segments serving subdivisions.
- **Critical facilities.** Future critical facilities in Kennebec County will be vulnerable to severe winter storms in the same manner that individual buildings will be vulnerable. However, some of them will likely have back-up generator systems which will allow heating systems to continue operating during a power outage.

### Wildfires

- **Buildings.** Wildfires in Kennebec County municipalities primarily threaten residential structures in the wildland-urban interface. In all Kennebec County communities, homes are allowed to be built in most land use zones. Some communities may decide to provide wildfire protection information to new residents who wish to build new homes at the time they are issued a land use permit.
- **Infrastructure.** Future power, phone and cable lines can be damaged during a wildfire, although the level of future development is expected to be minimal, primarily because of the low growth rate projected for the County.
- **Critical facilities.** Future critical facilities may be vulnerable to a very large wildfire. However, the expectation is that there will be very few new critical facilities constructed during the life of this plan.

The Maine Forest Service's (MFS) Forest Protection Division provides forest fire protection services for all of Maine's forest lands. MFS' goals are to keep the number of forest fire starts to less than 1,000 and annual acreage loss to less than 3,500. Since 2002, MFS has met those goals because of:

- Quick and effective initial attack on all fires;
- Effective air detection and aerial suppression;



## Kennebec County Hazard Mitigation Plan – 2021 Update

- Modern forest fire-fighting equipment;
- Strong emphasis on fire prevention, including State control of statewide burning permits;
- Aggressive training and preparation;
- Improved access to remote areas of the State;
- Northeast Forest Fire Compact membership, providing resources during periods of high fire danger;
- Proactive public information campaigns;
- Law enforcement; and
- Extensive automated weather stations providing accurate daily information used to assist in planning fire operations.

In 2001, the MFS developed a Wildland Urban Interface Committee. This committee was assigned the responsibility of assessing the risk of wildfire to homes within and near forested areas. MFS has printed and distributed over 4,000 brochures and has developed public service announcements alerting homeowners to the potential threat of wildfire in interface areas and what they can do to limit their exposure to the threat of wildfires. MFS has also partnered with the National Park Service to deliver software that can determine risk in Maine communities.

MFS has also launched a community assessment program aimed at focusing its fire prevention efforts on geographical areas of the State with relatively high occurrences of wildfires. The assessment involves working with local officials and the public to identify vulnerable homes in the urban/wildland interface. MFS then prepares a community wildfire protection plan that contains guidelines that homeowners can use to protect their homes. The emphasis is on maintaining a 30-foot defensible space around homes.

### Severe Summer Storms

- **Buildings.** New buildings in Kennebec County will be less vulnerable to summer storms. There may be damage to roofs, windows, and electrical during a severe summer storm. However, new roofs are designed to withstand high winds and heavy rain.
- **Infrastructure.** Roads and power transmission lines will continue to be the most vulnerable category of infrastructure. New roads can be just as easily blocked on a temporary basis due to heavy rainfall, water building up on the road surface, and debris such as tree limbs accumulating on the road surface during a summer storm event. However, it is unlikely that Kennebec County will experience much new road construction, with the possible exception of small road segments serving subdivisions.
- **Critical facilities.** Future critical facilities in Kennebec County will be vulnerable to summer storms in the same manner that individual buildings will be vulnerable.

**Assessing Vulnerability: Estimating Potential Losses**

The Kennebec County Hazard Mitigation Planning Team used historical data to estimate the potential dollar losses if the County were to experience flooding, severe winter storms, wildfires, and severe summer storms, the most likely hazards to occur in the County. The vulnerable structures and facilities were identified earlier in the planning process. See the County and Municipal Base Maps to locate the Facilities impacted by the Hazard Areas.

The Kennebec County Hazard Mitigation Planning Team estimated the potential losses from flooding, severe winter storms, wildfires and severe summer storms. The results are listed on the following pages.

**Overview.** This section of the Plan relies on historical damages as the basis for estimating future losses, subject to the following:

- Historical damage estimates have been updated, using the Consumer Price Index shown below;
- Presidential Disaster Declarations have been used where possible, updated for inflation using the Consumer Price Index below;
- Where statewide or county damages are used to determine damages for a specific jurisdiction, the damages are pro-rated using the 2020 Census.

The average annual Consumer Price Index for various years is shown below, based on a value of 100 for the years 1982-1984.

<b>Consumer Price Index 1982-1984 = 100</b>		
1947 = 22.3	1994=148.2	2009=214.5
1980 = 82.4	195=152.4	2010=218.1
1981 = 90.9	1996=156.9	2011=224.9
1982 = 96.5	1997=160.5	2012=229.6
1983 = 99.6	1998=163.0	2013=233.0
1984 = 103.9	1999=166.6	2014=236.7
1985 = 107.6	2000=172.2	2015=237.0
1986 = 109.6	2001=177.1	2016=240.0
1987 = 113.6	2002=179.9	2017=245.1

Kennebec County Hazard Mitigation Plan – 2021 Update

1988 = 118.3	2003=184.0	2018=251.1
1989 = 124.0	2004=188.9	2019=255.7
1990 = 130.7	2005=195.3	2020=258.8
1991=136.2	2006=201.6	
1992=140.3	2007=207.3	
1993=144.5	2008=215.3	

**Flooding.** This plan uses worst-case, real-life damages to calculate potential flood losses, and assumes that historic patterns will hold for the future. The worst case flood is the April Fool’s Day flood of 1987, which resulted in a Presidential Disaster Declaration of \$100,000,000 in damages to 10 counties. Using the Consumer Price Index (CPI), the damages in 2020 dollars would be \$227,816,901 (multiply \$100 million by 258.8 – the CPI for 2020, and divide by 113.6 – the CPI for 1987).

The methodology for calculating potential losses in Kennebec County is to assume the greater of:

- 1) Actual damages from the 1987 flood updated using the Consumer Price Index (column B in the table below),
- 2) Actual damages from flooding other than the 1987 flood, updated using the Consumer Price Index, when they are greater than the updated damages from the 1987 flood (column C in the table below),
- 3) Flood losses based on \$195 per capita (column D in the table below). The \$195 is calculated by taking the population of the counties that suffered damages in 1987 (1,167,044) and dividing it into total 1987 flood damages in 2020 dollars (\$227,816,901) to get a per capita cost of \$195. Each town’s 2020 population is multiplied by \$195 to get potential damages. In most cases, column D results in the highest loss estimate.

The maximum flood loss (column E) is the greater of columns B, C or D.

<b>Potential Flood Losses in Kennebec County</b>					
<b>Jurisdiction</b>	<b>A. Actual 1987 Flood Losses</b>	<b>B. Updated 1987 Flood Losses Using CPI</b>	<b>C. Other Flood Losses Updated with CPI when Higher than 1987</b>	<b>D. Flood Losses Based on \$195/Capita</b>	<b>E. Maximum Potential Flood Loss</b>
Albion	\$2,632	\$5,996	16,448 <sup>5</sup>	\$391,170	\$391,170

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Potential Flood Losses in Kennebec County</b>					
<b>Jurisdiction</b>	<b>A. Actual 1987 Flood Losses</b>	<b>B. Updated 1987 Flood Losses Using CPI</b>	<b>C. Other Flood Losses Updated with CPI when Higher than 1987</b>	<b>D. Flood Losses Based on \$195/Capita</b>	<b>E. Maximum Potential Flood Loss</b>
Augusta	331,811	755,922		3,685,305	3,685,305
Belgrade	9,429	21,481		633,750	633,750
Benton	18,001	41,009		529,425	529,425
Chelsea	7,751	17,658	579,570 <sup>5</sup>	541,710	579,570
China	14,044	31,995	56,762 <sup>4</sup>	859,560	859,560
Clinton	9,321	21,235		657,150	657,150
Farmingdale	11,202	25,520	53,965 <sup>3</sup>	584,025	584,025
Fayette	9,038	20,590	445,700 <sup>5</sup>	226,200	445,700
Gardiner	28,931	65,910	136,874 <sup>1</sup>	1,162,395	1,162,395
Hallowell	31,791	72,425		501,150	501,150
Litchfield	2,783	6,340	58,238 <sup>3</sup>	699,270	699,270
Manchester	3,196	7,281	138,868 <sup>5</sup>	478,920	478,920
Monmouth	4,692	10,689	56,329 <sup>4</sup>	792,870	792,870
Mt Vernon	5,285	12,040	192,931 <sup>5</sup>	335,595	335,595
Oakland	6,358	14,485		1,214,850	1,214,850
Pittston	0	0	30,700 <sup>3</sup>	560,625	560,625
Randolph	8,055	18,351	22,345 <sup>2</sup>	339,885	339,885
Readfield	4,860	11,072	297,896 <sup>4</sup>	506,415	506,415

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Potential Flood Losses in Kennebec County</b>					
<b>Jurisdiction</b>	<b>A. Actual 1987 Flood Losses</b>	<b>B. Updated 1987 Flood Losses Using CPI</b>	<b>C. Other Flood Losses Updated with CPI when Higher than 1987</b>	<b>D. Flood Losses Based on \$195/Capita</b>	<b>E. Maximum Potential Flood Loss</b>
Rome	1,298	2,957	35,907 <sup>5</sup>	223,860	223,860
Sidney	5,115	11,653	52,059 <sup>4</sup>	905,775	905,775
Unity Twp	0	0	0	7,020	7,020
Vassalboro	12,654	28,828	26,598 <sup>4</sup>	881,400	881,400
Vienna	18,673	42,540	205,152 <sup>5</sup>	112,710	205,152
Waterville	29,245	66,625		3,086,460	3,086,460
Wayne	12,010	27,361	144,196 <sup>5</sup>	220,155	220,155
W. Gardiner	0	0		715,845	715,845
Windsor	5,507	12,546	88,771 <sup>4</sup>	513,240	513,240
Winslow	390,064	888,632		1,549,860	1,549,860
Winthrop	4,147	9,448	133,291 <sup>4</sup>	1,193,595	1,193,595
<b>Total</b>	<b>\$987,893</b>	<b>\$2,250,589</b>		<b>\$24,110,190</b>	<b>\$24,459,992</b>

<sup>1</sup> 1992 flood damages, updated using CPI

<sup>2</sup> 1993 flood damages, updated using CPI

<sup>3</sup> 1998 flood damages, updated using CPI

<sup>4</sup> 2005 flood damages, updated using CPI

<sup>5</sup> 2007 flood damages, updated using CPI

**Severe winter storms.** This plan uses worst-case, real-life damages to calculate potential winter storm damages, and assumes that historic patterns will hold for the future. For Kennebec County, the worst storm is the ice storm of 1998, which resulted in a statewide Presidential Disaster Declaration of \$47,748,466. The actual damages were closer to \$100,000,000 because the Disaster Declaration did not cover damages to power lines and private structures. Using the Consumer Price Index, the \$47.7 million in damages would be \$75,811,675 million in 2020 dollars (multiply \$47.7 million by 258.8 – the CPI for 2020, and divide by 163.0 – the

Kennebec County Hazard Mitigation Plan – 2021 Update

CPI for 1998). The 1998 damages in Kennebec County totaled \$4,944,231, which would be \$7,850,104 in 2020 dollars.

The methodology for calculating potential losses in Kennebec County is to assume the greater of:

- 1) Actual damages updated using the Consumer Price Index (column B in the table below), or
- 2) Winter storm losses based on \$57 per capita (column C in the table below). The \$57 is calculated by taking the 2010 population of Maine (1,328,361) and dividing it into total 1998 ice storm damages in 2020 dollars (\$75,811,675) to get a per capita cost of \$57. Each town’s population is multiplied by \$57 to get potential damages.

The maximum winter storm loss (column D) is the greater of column B or C.

<b>Potential Winter Storm Losses in Kennebec County</b>				
	<b>A. Actual 1998 Ice Storm Damages</b>	<b>B. Updated Ice Storm Losses Using CPI</b>	<b>C. Winter Storm Losses Based on \$57 Per Capita</b>	<b>D. Maximum Potential Winter Storm Loss</b>
Albion	\$147,879	\$234,792	\$114,342	\$234,792
Augusta	1,047,776	1,663,585	1,077,243	1,663,585
Belgrade	93,862	149,028	185,250	185,250
Benton	48,266	76,634	154,755	154,755
Chelsea	83,867	133,158	158,346	158,346
China	287,829	456,995	251,256	456,995
Clinton	57,647	91,528	192,090	192,090
Farmingdale	180,833	287,114	170,715	287,114
Fayette	129,584	205,744	66,120	205,744
Gardiner	260,312	413,305	339,777	413,305
Hallowell	104,077	165,246	146,490	165,246
Litchfield	122,421	194,372	204,402	204,402
Manchester	181,796			

Kennebec County Hazard Mitigation Plan – 2021 Update

		288,643	139,992	288,643
Monmouth	193,296	306,902	231,762	306,902
Mount Vernon	188,663	299,546	98,097	299,546
Oakland	126,968	201,591	355,110	355,110
Pittston	66,543	105,652	163,875	163,875
Randolph	35,620	56,555	99,351	99,351
Readfield	183,139	290,775	148,029	290,775
Rome	37,532	59,591	65,436	65,436
Sidney	116,820	185,479	264,765	264,765
Unity Township	0	0	2,052	2,052
Vassalboro	121,873	193,501	257,640	257,640
Vienna	27,401	43,505	32,946	43,505
Waterville	420,068	666,955	902,196	902,196
Wayne	80,446	127,727	64,353	127,727
West Gardiner	91,306	144,969	209,247	209,247
Windsor	89,544	142,172	150,024	150,024
Winslow	205,984	327,047	453,036	453,036
Winthrop	212,879	337,994	348,897	348,897
<b>Total</b>	<b>\$4,944,231</b>	<b>\$7,850,105</b>	<b>\$7,047,594</b>	<b>\$8,765,181</b>

**Wildfires.** This plan uses worst-case, real-life damages to calculate potential wildfire losses, and assumes that historic patterns will hold for the future. The 1947 fire was the worst on record, although it was actually a series of wildfires that flared over Eastern and Southern Maine. The 1947 fire caused an estimated \$30,000,000 in damages to Cumberland, Hancock, Oxford and York Counties. The damage in 2014 dollars would be about \$348.1 million (multiply \$30 million by 258.8 – the CPI for 2020, and divide by 22.3 – the CPI for 1947). While there is significantly more development in each of these counties today than there was in 1947, fire-fighting capabilities have also increased substantially since that time so there may be no need

Kennebec County Hazard Mitigation Plan – 2021 Update

to further increase the damage estimate. The probability that a wildfire such as the 1947 fire will hit Maine during the five-year period covered by this Plan is low.

The methodology for calculating potential wildfire losses in Kennebec County is based on the damages that occurred in the 1947 fire in Cumberland, Hancock, Oxford and York Counties. The 2020 population of these four counties is 628,296. Divide \$\$348.1 million (the 1947 fire in 2020 dollars) by 628,296 to get a per capita cost of \$554. Multiply each town’s population by \$554 to get potential wildfire damages.

<b>Potential Wildfire Damages in Kennebec County</b>		
<b>Town/City</b>	<b>Year-Round Population 2020*</b>	<b>Potential Wildfire Damages (Population x \$554)</b>
Albion	2,118	\$1,111,324
Augusta	18,747	10,470,046
Belgrade	3,150	1,800,500
Benton	2,716	1,504,110
Chelsea	2,749	1,539,012
China	4,331	2,442,032
Clinton	3,368	1,866,980
Farmingdale	2,924	1,659,230
Fayette	1,171	642,640
Gardiner	5,674	3,302,394
Hallowell	2,384	1,423,780
Litchfield	3,678	1,986,644
Manchester	2,556	1,360,624
Monmouth	4,167	2,252,564
Mount Vernon	1,704	953,434
Oakland	6,336	3,451,420
Pittston	2,800	1,592,750
Randolph	1,711	965,622
Readfield	2,584	1,438,738
Rome	1,010	635,992
Sidney	4,527	2,573,330
Unity Township	41	19,944
Vassalboro	4,414	2,504,080
Vienna	577	320,212
Waterville	16,580	8,768,712
Wayne	1,160	625,466
West Gardiner	3,376	2,033,734
Windsor	2,617	1,458,128
Winslow	7,648	4,403,192
Winthrop	6,023	3,391,034
<b>Total</b>	<b>123,642</b>	<b>\$68,197,668</b>

\*2020 Census Data not complete



## Kennebec County Hazard Mitigation Plan – 2021 Update

**Severe summer storms.** Hurricane damages are included in the Severe Summer Storm Events category profiled in this Plan, and not as a separate category due to the low occurrence of hurricanes in Kennebec County, as noted earlier in this Plan. Worst case, real life damages were used to calculate potential damages from hurricanes. The most recent, devastating hurricane to hit Kennebec County was Hurricane Bob in 1991. There are two hurricanes that could be used to calculate future hurricane damage potential – Hurricane Bob in 1991, and Hurricane Edna in 1954.

Hurricane Bob produced \$5,523,665 in damages to the following counties: Androscoggin, Cumberland, Franklin, Kennebec, Sagadahoc and York. The population of these six counties totaled 691,428 people (1990 Census), resulting in a per capita damage of \$8/person. In 2014 dollars, this would be \$15 (multiply \$8 by the 2020 CPI of 258.8 and divide by the 1991 CPI of 136.2).

Hurricane Edna produced statewide hurricane damages of \$7 million in 1954. Maine’s 1950 population was 913,774, resulting in per capita damage costs of \$8. In 2014 dollars this would be \$77 (multiply \$8 by the 2020 CPI of 258.8 and divide by the 1954 CPI of 26.9). The damages caused by Hurricane Edna are far greater in 2020 dollars than Hurricane Bob, and are thus a better measure of the potential damages that could occur during a future hurricane in Kennebec County.

The following table includes a town-by-town estimate of potential hurricane damages based on the 2020 Census and a per capita damage figure of \$77.

<b>Potential Hurricane Damages in Kennebec County</b>		
<b>Town/City</b>	<b>Year-Round Population 2020*</b>	<b>Potential Hurricane Damages (Population x \$77)</b>
Albion	2,118	\$154,462
Augusta	18,747	1,455,223
Belgrade	3,150	250,250
Benton	2,716	209,055
Chelsea	2,749	213,906
China	4,331	339,416
Clinton	3,368	259,490
Farmingdale	2,924	230,615
Fayette	1,171	89,320
Gardiner	5,674	458,997
Hallowell	2,384	197,890
Litchfield	3,678	276,122
Manchester	2,556	189,112
Monmouth	4,167	313,082
Mount Vernon	1,704	132,517
Oakland	6,336	479,710
Pittston	2,800	221,375
Randolph	1,711	134,211

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Potential Hurricane Damages in Kennebec County</b>		
<b>Town/City</b>	<b>Year-Round Population 2020*</b>	<b>Potential Hurricane Damages (Population x \$77)</b>
Readfield	2,584	199,969
Rome	1,010	88,396
Sidney	4,527	357,665
Unity Township	41	2,772
Vassalboro	4,414	348,040
Vienna	577	44,506
Waterville	16,580	1,218,756
Wayne	1,160	86,933
West Gardiner	3,376	282,667
Windsor	2,617	202,664
Winslow	7,648	611,996
Winthrop	6,023	471,317
<b>Total</b>	<b>123,642</b>	<b>\$9,220,434</b>

\* 2020 Census Data not complete

**NESEC Hazus Flood and Hurricane Impact Analysis Reports**

In 2016, the North East States Emergency Consortium (NESEC) completed quantitative reports on the potential impacts of major flooding, hurricane, and earthquake events on Kennebec County. Results of the flooding and hurricane reports are summarized in this Plan to support the flooding and severe summer storm hazard profiles. Reports were generated using Hazus, a software program provided by FEMA for modeling large hazards, community vulnerabilities, and losses associated with impacts.

The purpose of Hazus Impact Analysis Reports is to provide emergency managers and other government decision makers with the calculation, mapping, and communication of model disaster data in a region. These reports provide a rough estimate of potential damage and other human and economic impacts resulting from hypothetical natural disaster scenarios. Each Hazus model uses inventory information (buildings, infrastructure, and population), hazard extent and intensity data, and damage functions to estimate the impacts of disasters. Estimated impacts vary by model, but include building damages, economic losses, displaced households, casualties, debris, and the loss of function for essential facilities.

**Flooding:** The Flood Impact Analysis Report was generated based on the impacts of a major flooding event that probabilistically has a 1 in 500 (0.2%) chance of occurring in a year. This model differs from historic damage data and the per capita models in that there may be no comparable event in recorded history for Kennebec County. Please note that this flood report estimates damage caused directly by the flood, and does not include damage caused by collateral impacts such as hazardous materials releases.<sup>1</sup>

Hazus Flood loss table:

<b>Estimated Direct Economic Losses for Buildings<sup>2</sup></b>
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Building Damage (Structural, Non-Structural)	\$135,430,000
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## Kennebec County Hazard Mitigation Plan – 2021 Update

Building Contents Damage	\$152,531,000
Business Interruption (Income Losses)	\$1,004,000
<b>Total Building-Related Losses</b>	<b>\$288,965,000</b>
Losses Range	(\$144,482,500 - \$577,930,000)

<b>Estimated Displaced People<sup>3</sup></b>
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Number of Displaced People	5,129
Number of People Needing Short Term Shelter	2,402

<b>Estimated Debris Generated</b>
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Finishes	9,599 Tons
Structures	12,852 Tons
Foundations	9,620 Tons
<b>Total Debris</b>	<b>32,071,000 Tons</b>

**1. Disclaimer:**

*This rapid estimate of social and economic impacts was produced using Hazus-MH loss estimation methodology software which is based on current scientific and engineering knowledge and assumptions. There are limitations and uncertainties inherent in HAZUS and in all other loss estimation techniques. Therefore, there may be significant differences between the modeled and mapped results contained in this report and the actual losses following a specific earthquake. Hazus-MH appears to overestimate losses for earthquakes less than 6.0 in urban areas..*

**2. Note:**

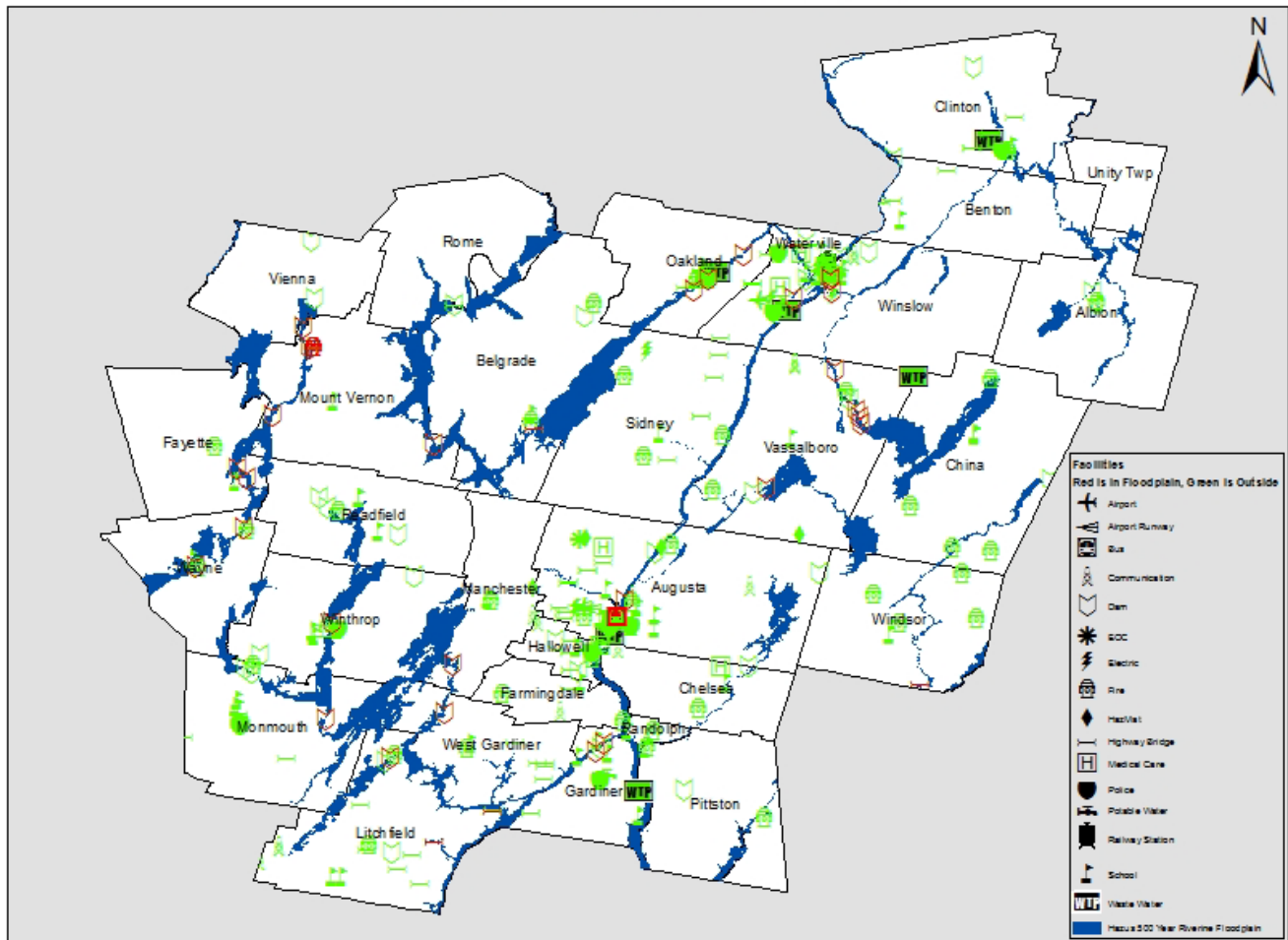
*Values are in 2014 dollars.*

**3. Note:**

*Not all displaced people will seek public shelter. The number of people seeking public shelter will vary by state and region. These numbers are based on data from the 2010 Census.*

Kennebec County Hazard Mitigation Plan – 2021 Update

Kennebec County, Maine Essential Facilities in Relation to Flooding from a Hazus 500 Year Riverine Event



36 Facilities Within a Floodplain

Map of 0.2% flood plains (blue) and critical facilities, (green), 36 of which are within the flood plain (red)

**Severe Summer Storm/Hurricane:** The Hurricane Impact Analysis Report was generated based on the impacts of a hypothetical Category 3 hurricane that makes landfall off the coast of Maine (storm parameters are based on the 1938 Hurricane<sup>7</sup>). It is important to note that this event does not necessarily represent the greatest impact a hurricane could have on Kennebec County, Maine. Though the chances for a severe hurricane occurring in the Northeast are low to moderate, any hurricane that tracks along the East Coast has the potential to negatively impact Maine. This model differs from historic damage data and the per capita models in that there is no comparable event in recorded history for Kennebec County. Please note that this hurricane report estimates damage caused directly by the hurricane and does not include damage caused by collateral impacts such as hazardous materials releases<sup>1</sup>.

Hazus hurricane loss table:

<sup>7</sup> 1938 Long Island and New England Hurricane: [https://en.wikipedia.org/wiki/1938\\_New\\_England\\_hurricane](https://en.wikipedia.org/wiki/1938_New_England_hurricane)

## Kennebec County Hazard Mitigation Plan – 2021 Update

### Estimated Direct Economic Losses for Buildings<sup>2</sup>

Building Damage (Structural, Non-Structural)	\$705,364,000
Building Contents Damage	\$275,010,000
Business Interruption (Income Losses)	\$140,242,000
<b>Total Building-Related Losses</b>	<b>\$1,120,616,000</b>
Losses Range	(\$560,308,000 - \$2,241,232,000)

### Estimated Displaced Households & People<sup>3</sup>

Number of Displaced Households	1,705 Households
Number of People Needing Short Term Shelter	406 People

### Estimated Debris Generated

Reinforced Concrete and Steel	461 Tons
Brick, Wood, Glass, Plaster and Other	87,695 Tons
Eligible Tree Debris	102,968 Tons
Other Tree Debris	1,199,517 Tons
<b>Total Debris</b>	<b>1,390,641 Tons</b>

**1. Disclaimer:**

*This rapid estimate of social and economic impacts was produced using Hazus-MH loss estimation methodology software which is based on current scientific and engineering knowledge and assumptions. There are limitations and uncertainties inherent in HAZUS and in all other loss estimation techniques. Therefore, there may be significant differences between the modeled and mapped results contained in this report and the actual losses following a specific earthquake. Hazus-MH appears to overestimate losses for earthquakes less than 6.0 in urban areas.*

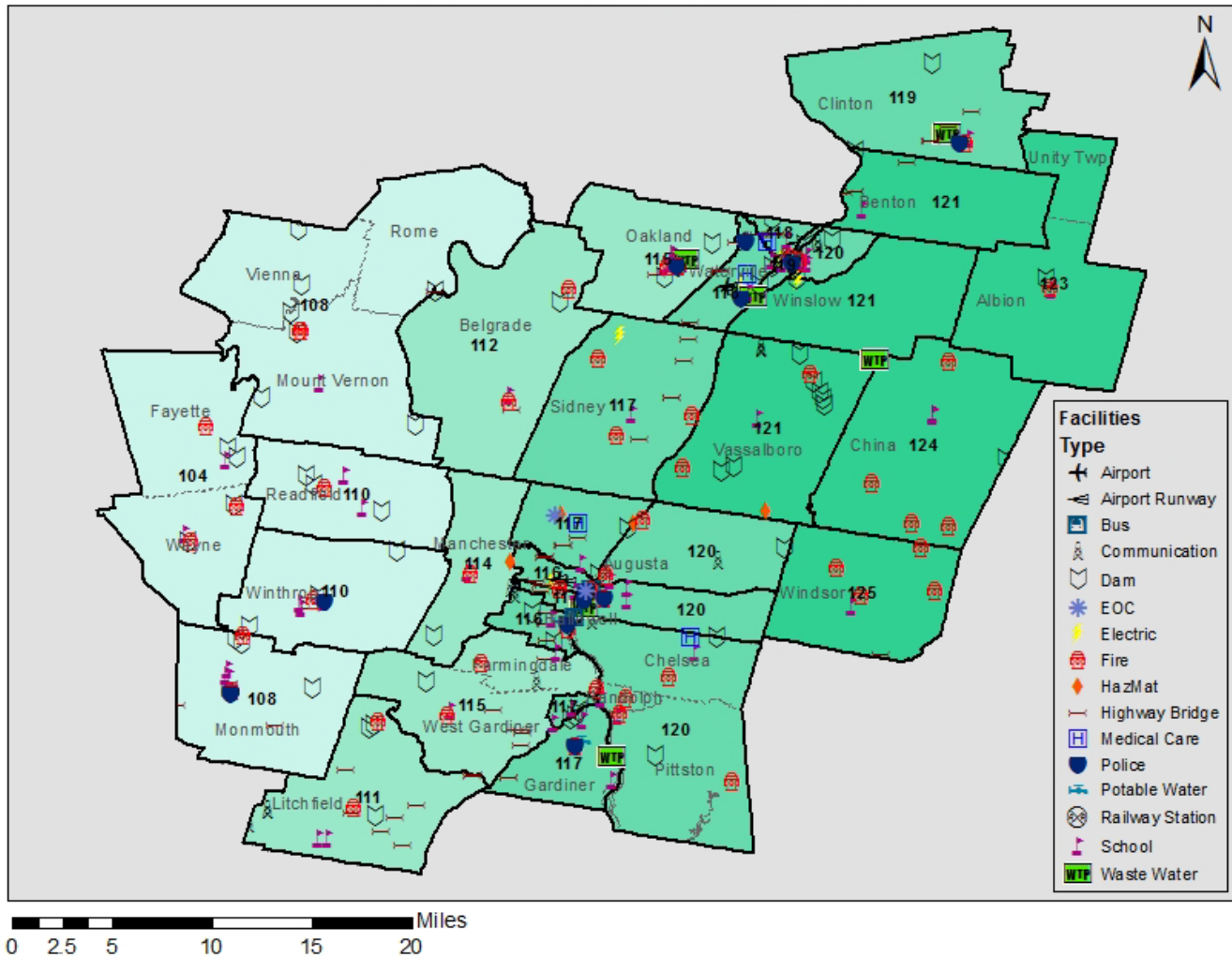
**2. Note:**

*Values are in 2014 dollars.*

**3. Note:**

*Not all displaced people will seek public shelter. The number of people seeking public shelter will vary by state and region. These numbers are based on data from the 2010 Census.*

Kennebec County, Maine Essential Facilities in Relation to Peak Gust Windspeeds from a Maine Worst Case Hurricane Scenario



**Assessing Vulnerability: Analyzing Development Trends**

There has been no change in vulnerability in Kennebec County over the past five years. Kennebec County is located in central Maine and is largely rural with pockets of suburban development. A majority of the County’s land use is designated as Rural and is primarily forestland or farmland. The largest city, Augusta, which has a year-round population of 19,136, is also the State Capitol and as such has a very large influx of daily state government workers. There are suburbs located in Augusta, Hallowell, Waterville, and Winslow. The land uses within the county generally consist of: Residential, Resource Protection, Agricultural, Industrial, Institutional and Commercial areas.

The State of Maine Legislature enacted the Growth Management Act in 1989 (Title 30-A, Chapter 187, subchapter 2) which requires each community to develop a municipal comprehensive plan. The municipal comprehensive plans recommend that development

occur in appropriate areas taking into account the environment, physical constraints, location of utility services, similarity to existing development, and proximity to flood zone areas.

The municipalities must review existing conditions and predict future needs in order to develop their own plans, policies, and ordinances. A local zoning ordinance must be based on and be consistent with the municipal comprehensive plan.

All of the municipalities in Kennebec County have enacted Floodplain management ordinances, and all have shoreland zoning ordinances, either locally adopted or state-imposed (if the community has not enacted a local ordinance meeting state minimum standards). Many communities also have other land use ordinances such as subdivision review ordinances and site plan review ordinances. As of December, 2010, a state building code regulates the construction of residential and non-residential development.

The chart on the following page lists the zoning districts that are in effect in Kennebec County communities. In general, residential and non-residential structures are not permitted in resource protection and stream protection districts.

**Flooding** will have an impact on all land use areas and zones within the 30 communities in Kennebec County. This hazard has the primary impact of restricting transportation, since it is primarily the roads that are subject to flooding in the County. This could impact business, industry, commerce and schools and delay many social and emergency services.

All 29 of the municipalities in Kennebec County have enacted floodplain management ordinances to prevent new commercial, industrial, and institutional development within flood zones (Unity Township is in Kennebec County's portion of the Unorganized Territory and is under the regulatory jurisdiction of the State's Land Use Planning Commission). There are some existing commercial developments within flood zones in the County, such as the downtown businesses in Augusta and Hallowell. These businesses have been in place for many years and are upgraded to meet floodplain ordinances as the structures are renovated or replaced. Additionally, there are a number of homes and seasonal camps that are within the flood zones. Likewise, as these properties are mortgaged, they may be required to be upgraded in order to meet the floodplain ordinances.

**Severe winter storms** will have an impact on all land use areas and zones within the 29 communities in Kennebec County. This hazard has the primary impact of shutting down transportation and power, which will shut down business, industry, commerce and schools and stop all social and emergency services.

**Wildfires** will have an impact on the residential properties located within the wildland-urban interface. Because much of Kennebec County is a moderate densely forested, sparsely populated area, there are a great number of homes that are at risk to destruction by forest fires. Currently, no municipality in Kennebec County has wildfire restrictions or requirements on residential development.

**Severe summer storms** may impact all land use areas and zones within the 29 communities in Kennebec County. This hazard has the primary impact of potentially shutting down

## Kennebec County Hazard Mitigation Plan – 2021 Update

transportation, since it is primarily the roads that are subject to the effects of high winds and the subsequent toppling of trees onto roads. This could impact business, industry, commerce and schools and delay many emergency and social services.

In 2018, The Maine’s State Economist has prepared population projections for the State and its counties to the year 2038<sup>8</sup>. Based on those projections, Kennebec County’s population is expected to increase from 122,151 in 2010 to a projected population of 125,406 in 2038. Kennebec County also saw an increase in population from the 2020 Census and is projected to have an increase of 1.22% to 123,642 people.<sup>8</sup> Maine was also expected have a population increase from its 2010 population of 1,328,361 to a projected population of 1,371,608 in 2038<sup>7</sup>. The 2020 Census population is projected to increase 2.6%, to a total of 1,362,359 people.<sup>8</sup>

### Summary

The communities of Kennebec County understand that flooding, severe winter storms, wildfires and severe summer storms can have a major impact on their lives and way of life. Nearly all Kennebec County municipalities have land use ordinances which control development in flood zones, coastal storm surge areas and along major transportation routes. However, during the last five-year planning cycle, there has been no significant developments that have impacted risk within Kennebec County.

The zoning districts that are in effect in Kennebec County are:

<b>Municipality</b>	<b>Land Use Types</b>
Albion	Resource Protection, Limited Residential, Stream Protection and Wetlands
Augusta	Institutional/Business/Professional, Local Business, Regional Business, Civic Center, Contract or Conditional, Government Services, Industrial, Kennebec Business 1, Kennebec Business 2, Medical, Planned Development, Planned Development 2, Low Density Residential, Medium Density Residential 1, Medium Density Residential 2, Riggs Brook Village, High Density Residential, Resource Development, Rural Ponds, Rural River, Rural River 2, Rural Residential, Rural Village
Belgrade	Resource Protection, Limited Commercial, Stream Protection, General Development
Benton	Resource Protection, Limited Residential, Stream Protection, and General Development
Chelsea	Resource Protection, Limited Residential, Stream Protection, Limited Commercial and General Development
China	Shoreland Protection, Resource Protection, Stream Protection, Rural, Wetlands
Clinton	Commercial C, Industrial-Commercial IC, Low Density LD, Medium Density MD, Rural R, Resource Protection RP, Potential Development PD, Limited Residential, General Development, Stream Protection
Farmingdale	Resource Protection, Limited Residential, Stream Protection, Limited Commercial, and General Development
Fayette	Resource Protection, Stream Protection, Rural Growth, Rural, Shoreland , Wetland Protection
Gardiner	Resource Protection, Shoreland, Rural, Residential Growth, High Density Residential, Central Business, Planned Industrial, Planned Commercial, Shoreland Overlay,

<sup>8</sup> State Economist county population projections: <https://www.maine.gov/dafs/economist/sites/maine.gov/dafs/economist/files/inline-files/MaineStateCountyPopulationProjections2038.pdf>

<sup>8</sup> Maine: 2020 Census, <https://www.census.gov/library/stories/state-by-state/maine-population-change-between-census-decade.html>



Kennebec County Hazard Mitigation Plan – 2021 Update

Municipality	Land Use Types
	Professional/Residential, Educational/Community Recreation, Cobbossee Corridor, Shoreland Overlay Limited Residential
Hallowell	High Density Residential RA, Moderate Density Residential RB1, Moderate Density RB2, Low Density Residential RC, Low Density/Multi-Family Limited Residential RD, Rural Farm RF, Downtown DT, Business A BA, Business B BB, Business C BC, Resource Protection RP, Open Space OP, Shoreland SD, Historic HD
Litchfield	Resource Protection, Limited Residential, Stream Protection and Limited Commercial
Manchester	Manchester Village, Community Residential, General Development, Rural Residential, Shoreland, Resource Protection, Aquifer Management Overlay
Monmouth	Resource Protection, Stream Protection, Rural, Shoreland Residential, Limited Residential, General Development
Mount Vernon	Limited Residential, Limited Commercial, Village, Rural, Stream Protection, Resource Protection
Oakland	Resource Protection, Limited Residential, Limited Commercial, General Development, Stream Protection
Pittston	Resource Protection, Limited Residential, Stream Protection, Limited Commercial and Wetland
Randolph	Resource Protection, Limited Residential, Limited Commercial, General Development, Commercial Fisheries, Downtown, Urban Residential, Resource Conservation, Community Residential
Readfield	Village, Village-Residential, Rural, Rural-Residential, Shoreland-Residential, Resource Protection, Stream Protection, Commercial and Industrial, Mobile Home Park
Rome	Shoreland Protection, Stream Protection, Resource Protection
Sidney	Lakeshore, River Shore, Stream Protection, Resource Protection and Wetlands
Vassalboro	Resource Protection, Limited Residential, Limited Residential Commercial
Vienna	Resource Protection, Limited Residential, Stream Protection and Wetlands
Waterville	Low Density Residential R-A, Medium Density R-B, General Residential R-C, General Residential R-D, Rural Residential R-R, Institutional INST, Commercial C-A, General Commercial C-B, Heavy Commercial C-C, High Commercial C-D, General Industrial IND, Industrial Park I-P, Airport Industrial A-I, Downtown Industrial D-I, Resource Protection RP, Transitional T, Contract Zoned CZD, Airport (AIR)
Wayne	Village Residential, Low Density Residential, Rural Residential/Farm, Shoreland, Resource Protection, Village Shoreland
West Gardiner	Resource Protection, Limited Residential, Stream Protection and Wetlands
Windsor	Resource Protection, Limited Residential, Stream Protection and Wildlife Habitat Areas
Winslow	High Density Residential, Medium High Density Residential, Multi-Family Residential, Low High Density Residential, Rural, Commercial and Restricted Commercial Overlay, Highway Commercial, Industrial, Highway Industrial, Seasonal Residential, Conservation, Resource Protection, Limited Residential, Stream Protection, General Development and Limited Commercial
Winthrop	General Commercial, General Residential, Industrial, Limited Commercial, Limited Residential, Resource Protection, Shoreland, Stream Protection, Village, Watershed, and Rural

## **Multi-Jurisdictional Risk Assessment**

Kennebec County is a mid-sized Maine county consisting of 122,842 people living in 867 square miles located in central of Maine. There are 29 municipalities within the County. All twenty-nine municipalities contributed to the risk assessment analyses performed for the Kennebec County Hazard Mitigation Plan.

The Planning Team identified flooding as the most significant risk to the entire County, followed in severity by severe winter and summer storms and wildfires.

River flooding will primarily affect the river communities of Augusta, Benton, Chelsea, Clinton, Farmingdale, Gardiner, Hallowell, Pittston, Randolph, Sidney, Vassalboro, Waterville, and Winslow.

All of the communities of Kennebec are susceptible to ice storms, blizzards and “Northeasters.” This causes damages to utilities, resulting in electrical power and communication outages and causes major road damages.

All areas are at risk from summer storms which could shut down transportation and power which, in turn, could shut down businesses, industry, commerce and schools and stop or impede social and emergency services.

Although all areas are at risk from wildfires, it is the less densely-populated areas of the northern communities that face extensive acreage losses. This is due to the lack of roadways (accessibility) within the forest land. Additionally, the resources for wildfire fighting from the inland municipal departments are very limited, due to the small population base.

## **Municipal Maps**

The following pages contain base maps of every community in Kennebec County. Included on the maps are critical and other public facilities.

## SECTION 5 MITIGATION STRATEGIES

<b>Mitigation Strategy</b>	
<p>Requirement: 44 CFR §201.6(c)(3): (The plan must include) a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:</p> <ul style="list-style-type: none"> <li>(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.</li> <li>(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction’s participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.</li> <li>(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.</li> <li>(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.</li> </ul>	
<b>Element</b>	<p>C1: Does the plan document each jurisdiction’s existing authorities, policies, programs and resources, and its ability to expand on and improve these existing policies and programs?</p>
	<p>C2: Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate?</p>
	<p>C3: Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?</p>
	<p>C4: Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?</p>
	<p>C5: Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction?</p>
	<p>D2: Was the plan revised to reflect progress in local mitigation efforts?  <b>Yes, plans were updated to reflect projects completed and new long, mid-range, and short-term programs.</b></p>
	<p>D3: Was the plan revised to reflect changes in priorities?  <b>Yes, plans were updated to show areas of greater concern over the last five years.</b></p>

## C1. Existing Authorities, Policies, Programs and Resources

Below is a summary of existing authorities, policies, programs and resources available to accomplish hazard mitigation. See also the table that follows this summary.

- **Town Manager, Administrator, Administrative Assistant to the Selectmen:** Some municipalities in Kennebec County have a town manager, others have an administrator whose duties may vary from those of a town manager, and still others have an administrative assistant to the selectmen who may serve as staff to the selectmen but may not have the powers of a town manager to hire staff. In the table below, “TM” indicates town manager; “A” indicates administrator, and “AA” indicates administrative assistant.
- **Board of Selectmen or Board of Assessors:** If a municipality has no Town Manager, that role is filled by a Board of Selectmen, or in the case of a plantation, by a Board of Assessors. Depending on the community’s needs and financial resources, the Board might also serve as Road Commissioner.
- **Staff Resources:** Staff resources, where available, usually consist of a planner or community development director. There are no municipalities in Kennebec County with staff resources devoted exclusively to hazard mitigation.
- **Public Works or Road Commissioner:** Some of the larger municipalities have a public works director, but most have a road commissioner. The road commissioner might also be the town manager or board of selectmen.
- **Flood Hazard Ordinance:** All of the municipalities that are in the Flood Insurance Program have a flood hazard ordinance in effect. In the following table, the designation “LUPC” indicates that the plantation’s flood plains are under the regulatory jurisdiction of the State’s Land Use Planning Commission (LUPC).
- **All of the municipalities in Kennebec County** are required to have a shoreland zoning ordinance, whether adopted by the municipality or imposed by the Maine Department of Environmental Protection. The designation LUPC indicates that the plantation’s shorelands are under the regulatory jurisdiction of the State’s Land Use Planning Commission.
- **Form of Government:** In the following table, the letters “ST” indicate the selectmen/town meeting form of government; a “Council” indicates a council form of government and the designation LUPC indicates that the plantation is governed by the State’s Land Use Planning Commission.
- **Resources:** In addition to staffing or other expertise, funding resources are from local taxes and/or grants that are funded by taxes or private donations.
- **Building Code:** The Maine Uniform Building and Energy Code (MUBEC) applies to all towns within the State of Maine. Enforcement of MUBEC by municipalities is based on population or local action for communities under 4,000 residents based on the US Census Bureau’s most recent decennial census. MUBEC is made up of the following codes and standards:
  - 2015 International Residential Code (IRC)
  - 2015 International Building Code (IBC)
  - 2015 International Existing Building Code (IEBC)
  - 2015 International Energy Conservation Code (IECC)

## Kennebec County Hazard Mitigation Plan – 2021 Update

- The following standards are also adopted as part of the MUBEC, and are mandatory: The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standards:
  - 62.1 - 2016 (Ventilation for Acceptable Indoor Air Quality)
  - 62.2 - 2016 (Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings)
  - 90.1 - 2016 (Energy Standard for Buildings except Low-Rise Residential Buildings) editions without addenda.
  - E-1465-2008, Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings.
  - Maine has adopted the national model codes and standards with amendments. The amendments are listed in Rule Chapters 1-6. Chapters can be found here: <https://www.maine.gov/dps/fmo/building-codes/mubec-rules>.
  - (text copied from Office of State Fire Marhsall: <https://www.maine.gov/dps/fmo/building-codes>)
  - Tree Care and electricity transmission/distribution lines: Central Maine Power implements tree pruning and removals within rights of ways to reduce potential service interruptions during and after severe summer or winter storms. For more information refer to: <https://www.cmpco.com/wps/portal/cmp/outages/weareready/treecare/>
- **Kennebec Valley Council of Governments (KVCOG):** KVCOG is one of seven federally designated Economic Development Districts in the state of Maine that provide the following services to Kennebec County and the surrounding jurisdictions:
  - Community Planning
  - Joint Purchasing
  - GIS & Mapping
  - Economic and Community Development
  - Environmental Planning
  - Grant Opportunities
  - Local business services

All jurisdictions in Kennebec County could expand and improve their existing capabilities if additional funds, grants, or other contributions beyond their existing tax bases, became available to address hazard mitigation projects listed on the following pages.

### Key to table on next page

“X” - Yes

“TM” – Town Manager

“AA” – Administrative Assistant

“LUPC” – Maine Land Use Planning Commission

“ST” – Selectmen/Town Meeting form of government

“Council” – City or Town Council form of government

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Authorities, Policies, Programs and Resources Available to Accomplish Hazard Mitigation</b>							
<b>Town</b>	<b>Town/City Manager</b>	<b>Staff involved in Local Planning</b>	<b>Public Works or Road Commissioner</b>	<b>EMA Director</b>	<b>Flood Hazard Ordinance</b>	<b>Shoreland Zoning Ordinance</b>	<b>Form of Government</b>
Albion	AA		X	X	X	X	ST
Augusta	X	X	X	X	X	X	Council
Belgrade	X		X	X	X	X	ST
Benton			X	X	X	X	ST
Chelsea	X		X		X	X	ST
China	X		X	X	X	X	ST
Clinton	X		X	X	X	X	ST
Farmingdale	AA		X	X	X	X	ST
Fayette	X		X	X	X	X	ST
Gardiner	X	X	X		X	X	Council
Hallowell	X		X	X	X	X	Council
Litchfield	X		X	X	X	X	ST
Manchester	X		X	X	X	X	ST
Monmouth	X		X	X	X	X	ST
Mount Vernon	AA		X	X	X	X	ST
Oakland	X		X	X	X	X	Council
Pittston	AA		X	X	X	X	ST
Randolph			X	X	X	X	ST
Readfield	X		X	X	X	X	ST
Rome			X	X	X	X	ST
Sidney	AA		X	X	X	X	ST
Unity Township			*		LUPC	LUPC	LUPC
Vassalboro	X		X	X	X	X	ST
Vienna			X		X	X	ST
Waterville	X	X	X		X	X	Council
Wayne	X		X	X	X	X	ST
West Gardiner	AA		X	X	X	X	ST
Windsor	X		X	X	X	X	ST
Winslow	X		X	X	X	X	Council
Winthrop	X		X	X	X	X	Council

\* Board of Supervisors are the road commissioner for Unity Township

**C2. Participation in the NFIP National Flood Insurance Program**

As shown in the table below, all of the municipalities in Kennebec County, as well as Unity Township, are in the Flood Insurance Program, and as a condition of participation in the program, have enacted floodplain management ordinances that limit new development in floodplain areas.

Unity Township is in Kennebec County’s portion of Maine’s Unorganized Territory and is under the jurisdiction of Maine’s Land Use Planning Commission (LUPC). LUPC has agreed to administer and enforce the NFIP for all communities that are under its control and has modified its requirements to include floodplain management regulations. As shown in the table below, Unity Township is in the NFIP by virtue of the fact that it is under the jurisdiction of the LUPC.

The table below summarizes the participation of Kennebec County municipalities in the NFIP.

<b>Kennebec County Communities Participating in the NFIP</b>					
<b>Town</b>	<b>Init FHBM<sup>1</sup></b>	<b>Init FIRM<sup>1</sup></b>	<b>Curr Eff Map Date<sup>1</sup></b>	<b>Reg-Emer Date<sup>1</sup></b>	<b>Adoption and Enforcement<sup>2</sup></b>
Albion	02/21/75	09/27/85	06/16/11	09/27/85	X
Augusta	06/28/74	04/01/81	06/16/11	04/01/81	X
Belgrade	01/31/75	01/16/87	06/16/11	01/16/87	X
Benton	01/24/75	05/04/88	06/16/11	05/04/88	X
Chelsea	02/21/75	06/04/80	06/16/11	06/04/80	X
China	02/21/75	06/05/89	06/16/11	06/05/89	X
Clinton	04/18/75	05/03/90	06/16/11	05/03/90	X
Farmingdale	08/02/75	09/30/80	06/16/11	09/30/80	X
Fayette	11/29/74	10/01/02	06/16/11	10/01/02	X
Gardiner	02/22/74	05/15/80	06/16/11	05/15/80	X
Hallowell	02/01/74	11/15/79	06/16/11	11/15/79	X
Litchfield	02/07/75	11/19/86	06/16/11	11/19/86	X
Manchester	12/06/74	10/15/80	06/16/11	10/15/80	X
Monmouth	04/18/75	09/03/80	06/16/11	09/03/80	X
Mount Vernon	04/18/75	08/19/85	06/16/11	08/19/85	X
Oakland	01/24/75	06/15/88	06/16/11	06/15/88	X
Pittston	12/27/74	03/16/81	06/16/11	03/16/81	X
Randolph	01/24/75	09/05/79	06/16/11	09/05/79	X
Readfield	02/21/75	12/16/80	06/16/11	12/16/80	X
Rome	12/27/74	05/17/80	06/16/11	05/17/80	X
Sidney	02/21/75	03/18/87	06/16/11	03/18/87	X
Unity Township	na	06/16/11	06/16/11	04/30/84	X
Vassalboro	02/07/75	08/01/06	06/16/11	08/01/06	X
Vienna	02/28/75	08/19/85	06/16/11	08/19/85	X
Waterville	03/29/74	02/17/88	06/16/11	02/17/88	X
Wayne	09/13/74	04/03/89	06/16/11	04/03/89	X
West Gardiner	12/27/74	03/28/80	06/16/11	03/28/80	X

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Kennebec County Communities Participating in the NFIP</b>					
<b>Town</b>	<b>Init FHBM<sup>1</sup></b>	<b>Init FIRM<sup>1</sup></b>	<b>Curr Eff Map Date<sup>1</sup></b>	<b>Reg-Emer Date<sup>1</sup></b>	<b>Adoption and Enforcement<sup>2</sup></b>
Windsor	01//17/75	02/04/87	06/16/11	02/04/87	X
Winslow	03/22/74	09/30/87	06/16/11	09/30/87	X
Winthrop	08/02/74	08/15/80	06/16/11	08/15/80	X

<sup>1</sup> Source: FEMA Community Status Book Report as of 15 November 2021:  
<https://www.fema.gov/cis/ME.pdf>

<sup>2</sup> Based on all available information, this community has adopted and continues to enforce a floodplain management ordinance, including regulating new construction in Special Flood Hazard Areas (SFHA). Kennebec EMA is not aware of any new construction in the SFHA.

**C3. Goals**

The Hazard Mitigation Planning Team reviewed the goals contained in the 2016 Hazard Mitigation Plan and determined that these goals should continue to guide this 2021 Hazard Mitigation Plan. The goals relate to the hazards profiled in this plan and include the following:

**Flooding:** Reduce damage, injury and possible loss of life in Kennebec County caused by flooding.

**Severe Winter Storms:** Reduce damage, injury and possible loss of life in Kennebec County caused by severe winter storms erosion.

**Wildfires:** Reduce damage, injury and possible loss of life in Kennebec County caused by wildfires.

**Severe Summer Storms:** Reduce damage, injury and possible loss of life in Kennebec County caused by severe summer storms.



**General Goals, Objectives and Mitigation Actions**

**Flooding**

In Kennebec County, the most likely damages caused by flooding are the destruction of roadways caused by washouts and undercutting. There are few critical facilities located in the 100 year flood zone. Nearly all communities are using the FIRM information to control development in flood zones. There could be a loss of life caused by individuals drowning during high water (river and lake) conditions or as a result of traveling on unstable river or lake ice.

**Goal:** Reduce potential damage, injury and loss of life in Kennebec County caused by flooding.

Mitigation Actions	Responsibility	Timeframe	Status
<p><b>A. River Flow Advisory Commission.</b> Continue to work with the River Flow Advisory Commission to monitor river flows and ice conditions during flood-prone times of the year.</p>	<p>Kennebec EMA</p>	<p>2022-2027 annually</p>	<p>Kennebec EMA continues to work with Advisory Commission</p>
<p><b>B. Ice jams/unsafe ice.</b> Continue to work with USGS, CRREL, and local officials to monitor ice jam conditions to: Advise local officials and the public about flooding potential and/or the dangers of traveling on unstable river or lake ice.</p> <p>Analysis: The most recent ice jam occurred in December of 2018 in Hallowell resulting in \$75,000 worth of damages to property along Front St. The most recent death from traveling on unsafe ice occurred in January, 2016.</p>	<p>Kennebec EMA</p>	<p>2022-2027 as the need arises</p>	<p>Kennebec EMA continues to be involved in ice jam monitoring.</p>
<p><b>C. 406 Funding.</b> Encourage communities to maximize the use of 406 funds through the Public Assistance (PA) Program.</p> <p>Analysis: This is an important program. Because it is written into the PA scope of work and budget, the work can be completed more quickly than by going through the 404 grant program.</p>	<p>County EMA Director</p>	<p>2022-2027 as 406 funds become available</p>	<p>Efforts ongoing and continually evaluated</p>

Kennebec County Hazard Mitigation Plan – 2021 Update

Mitigation Actions	Responsibility	Timeframe	Status
<p>Because the State pays 15% of the local share, the community only pays 10%, lessening the financial burden after a disaster for infrastructure protection and improvement.</p>			
<p><b>D. Dam Exercises.</b> Continue to participate in dam safety exercises.</p> <p>Analysis: Because High hazard potential dams can cause loss of life and property damage in the event of a failure, these exercises promote greater awareness of the risk and the need to keep the emergency plans current.</p>	<p>Kennebec County EMA</p>	<p>2022-2027 as exercises are scheduled</p>	<p>Kennebec County continues to participate in dam preparedness drills</p>
<p><b>E. Infrastructure Protection.</b> Inform local officials of training exercises, technical assistance and potential funding opportunities aimed at infrastructure protection.</p> <p>Analysis: Since there is constant turnover of public officials, and funding resources constantly ebb and flow, current information flow is critical to keeping officials up to date.</p>	<p>Kennebec County EMA</p>	<p>2022-2027 as opportunities arise</p>	<p>EMA continues to offer ICS 402 classes to municipalities in Kennebec County</p>
<p><b>F. NFIP participation.</b> Promote continued participation in the National Flood Insurance Program, as well as actions needed to ensure municipal compliance with flood insurance requirements.</p>	<p>Kennebec EMA</p>	<p>2022-2027 as exercises are scheduled</p>	<p>Kennebec EMA continues to provide NFIP information on its website and at workshops</p>
<p><b>G. Problem documentation.</b> Encourage municipalities to document the costs of repairing recurring flood damages to ditches, culverts, roadway drainage systems and roads to encourage mitigation actions that reduce long term risk.</p>	<p>Kennebec EMA</p>	<p>2022-2027 as opportunities arise</p>	<p>Currently included in workshops and training</p>

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Mitigation Actions</b>	<b>Responsibility</b>	<b>Timeframe</b>	<b>Status</b>
<p><b>H. Grant and Training Opportunities</b> – Notify communities of grant opportunities, workshops for developing competitive applications and training on mitigation best practices.</p>	<p>County EMA Director</p>	<p>2022-2027 as opportunities arise</p>	<p>Kennebec County continues to assist commuines with HSGP grants as well as grant review</p>

## Severe Winter and Summer Storms

**Severe winter storms.** The most likely damages caused by a severe winter storm event are the loss of electrical power, from downed power transmission lines, and the blockage of roadways, from tree debris or winter snow or ice. There could be loss of life caused by delayed responses from emergency services, the improper use of backup heat sources such as generators, freezing conditions, debris falling on an individual, or from storm-related vehicle accidents. Other types of general damage to personal and real property may be caused by high blizzard winds.

**Severe summer storms.** In Kennebec County, the most likely damages caused by the high winds and heavy rains from a severe summer storm or hurricane event are the loss of electrical power from downed power transmission lines, the blockage and/or washouts of roadways and the need for rapid debris removal. There could be loss of life caused by debris falling on an individual, or from storm-related vehicle accidents. Other types of general damage to personal and real property may be caused by severe storm or hurricane winds.

**Goal:** Reduce potential damage, injury and loss of life in Kennebec County caused by severe winter storms, summer storms or hurricane event.

Mitigation Actions	Responsibility	Timeframe	Status
<p><b>A. Generators.</b> Assist municipalities in applying for fire or mitigation grant funds for generators at critical facilities that are not in flood hazard areas.</p> <p>Analysis: As of a FEMA policy change in 2012, generators are eligible for mitigation funding. Generators can ensure the proper functioning of critical facilities during emergencies, thus making the whole community more resilient.</p>	County EMA Director	2022-2027	Kennebec County will continue to assist municipalities acquiring generators through HSGP grants.
<p><b>B. 406 Funding.</b> Maximize the use of 406 funds through the Public Assistance (PA) Program.</p>	County EMA Director	2022-2027 As 406 funds become available	Efforts ongoing and continually evaluated

Kennebec County Hazard Mitigation Plan – 2021 Update

Mitigation Actions	Responsibility	Timeframe	Status
<p>Analysis: This is an important aspect of the PA program for several reasons. Because it is written into the PA scope of work and budget, the work can be completed more quickly than by going through the 404 grant program. Because the State pays 15% of the local share, the community only pays 10%, lessening the financial burden after a disaster for infrastructure protection and improvement.</p>			
<p><b>C. Website/Media Outreach.</b> Include hazard mitigation information on the EMA website, social media and/or work with the media on public service announcements.</p>	<p>County EMA Director</p>	<p>2022-2027 as needed</p>	<p>Kennebec County continues to use Facebook and its Website to pass information to the general public</p>
<p><b>D. Infrastructure Protection.</b> Inform local officials about training exercises, technical assistance and potential funding opportunities aimed at infrastructure protection and severe storms hazard mitigation.</p> <p>Analysis: Since there is constant turnover in public officials, and funding resources constantly ebb and flow, information flow is critical to keeping current officials up to date on long-term risk reduction efforts.</p>	<p>County EMA Director</p>	<p>2022-2027 as opportunities arise</p>	<p>Efforts ongoing and continually evaluated</p>

Note: there are no actions related to new structures because winter-related hazards such as roof collapses are adequately covered by the State’s new building code which became effective on December 15, 2010 (the building code addresses snow

## Kennebec County Hazard Mitigation Plan – 2021 Update

loads). While small municipalities are not required to enforce the code, the code still applies in these communities and builders are required to retain third party inspectors to certify compliance with the new code.

## Wildfires

In Kennebec County, the most likely damages caused by a wildland fire event would be the potential loss of life, loss of prime timberland, and the destruction of personal and real property, especially homes. The loss of electrical power is also possible, since the majority of high voltage transmission lines pass through heavily wooded areas. The effects of a wildfire would keep tourists away from the area, resulting in major losses of income for local businesses.

**Goal:** Reduce potential damage, injury and loss of life in Kennebec County caused by wildfires.

Mitigation Actions	Responsibility	Timeframe	Status
<p><b>A. Public Education.</b> Notify local officials of fire prevention and mitigation workshops offered by the Maine Forest Service (MFS). Include fire prevention/mitigation information on the EMA website and social media. Include “fire-wise” information on the EMA website and social media.</p> <p>Analysis: The MFS has a wide variety of resources that can be accessed by the communities and businesses. These range from website information, social media, to individual consultations on methods for reducing potential damages from wildfires.</p>	<p>County EMA Director</p>	<p>2022-2027 as needed</p>	<p>Efforts ongoing and continually evaluated</p>
<p><b>B. Mutual Aid.</b> Evaluate the status of mutual aid agreements. Provide assistance to municipalities to update as necessary.</p> <p>Analysis: 90 percent of all fire fighters in Maine are volunteers. These volunteers must first leave their regular jobs to access the fire trucks and equipment <i>before</i> going to fight fires. Because few communities can support fully staffed fire departments, mutual aid is both a life-saver, and, cost effective. There is wholehearted support for mutual aid and therefore a great deal of cooperation and support among municipal fire departments. This has bolstered the fire-</p>	<p>County EMA Director</p>	<p>2022-2027 as needed with EMA Directors and fire departments</p>	<p>Efforts ongoing and continually evaluated</p>

Kennebec County Hazard Mitigation Plan – 2021 Update

<b>Mitigation Actions</b>	<b>Responsibility</b>	<b>Timeframe</b>	<b>Status</b>
fighting capabilities of all communities. Kennebec EMA is actively involved with municipal emergency response capabilities.			



**Rating of Actions and Establishment of Priorities**

The Kennebec County Hazard Mitigation Planning Team established priorities by hazard for the general mitigation actions set forth on the previous pages. The Team used the following criteria to rank each of the actions:

1. Life safety
2. Population benefited
3. Probability of community acceptance
4. Probability of funding
5. Feasibility of implementation

Each strategy was rated high (3 points), medium (2 points) or low (1 point) for each of the criteria, with the result that priorities were established by total score (the higher the points, the higher the priority).

<b>Rating of Flood Mitigation Actions</b>						
	<b>Life Safety</b>	<b>Population Benefited</b>	<b>Probability Community Acceptance</b>	<b>Probability Funding</b>	<b>Feasibility of Implementation</b>	<b>Total Score</b>
A. River Flow Advisory Commission	3	3	3	3	3	15
B. Ice Jams	3	3	3	3	3	15
C. 406 Funding	3	3	3	3	3	15
D. Dam Exercises	3	2	3	3	3	14
E. Infrastructure Protection	3	2	3	1	3	12
F. NFIP participation	2	2	3	3	3	13
G. Problem documentation	2	3	3	2	2	12
H. Grant and Training Opportunities	3	1	3	3	3	13

<b>Rating of Severe Winter and Summer Storm Mitigation Actions</b>						
	<b>Life Safety</b>	<b>Population Benefited</b>	<b>Probability Community Acceptance</b>	<b>Probability Funding</b>	<b>Feasibility of Implementation</b>	<b>Total Score</b>
A. Generators	3	2	3	3	3	14
B. 406 Funding	2	3	3	3	3	14
C. Website Media Outreach	1	1	3	3	3	11

Kennebec County Hazard Mitigation Plan – 2021 Update

D. Infrastructure Protection	3	3	3	1	1	11
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<b>Rating of Wildfire Mitigation Actions</b>						
	<b>Life Safety</b>	<b>Population Benefited</b>	<b>Probability Community Acceptance</b>	<b>Probability Funding</b>	<b>Feasibility of Implementation</b>	<b>Total Score</b>
A. Public Education	3	2	3	3	3	14
B. Mutual Aid	3	2	3	3	2	13

## **PRIORITIZED LOCAL MITIGATION PROJECTS**

Most of the municipalities in Kennebec County identified one or more projects consistent with the County-wide goals and mitigation actions, to mitigate hazards at the local level. The jurisdictions, as well as the specific projects they will pursue, are listed in priority order in the following table. The time frames shown are based upon the permitting requirements and availability of materials and funding.

**Criteria for prioritization.** The list of local projects was developed separately by each municipality in consultation with the County. Local officials did not use formal, written criteria for the identification of local projects. Local officials utilized the following criteria to develop and informally prioritize the list of projects:

- Local knowledge of the frequency and extent of local damages;
- Local knowledge of the potential benefits of hazard mitigation versus the cost of those actions;
- Local knowledge of project priorities, based on frequency and severity of damages;
- Local knowledge of the weather, the geography and topography of the community; and
- the technical and financial abilities of their respective communities to address hazards and mitigate the impacts of hazards.

**How the actions will be implemented.** The table below identifies a timeframe for each project and identifies one or more parties who will be responsible for implementation. If the municipalities apply for grant funds, a cost-benefit analysis will be undertaken. In addition, new standards ensure that

**Use of a cost-benefit analysis.** Many of the jurisdictions included in this Plan are small municipalities run by volunteers. These municipalities have tight budget constraints. They do not have staff, resources or funding to prepare cost-benefit analyses for the projects included in this plan. However, in virtually all cases involving expenditure of local funds for implementation, there will be a very rigorous, line-by-line analysis of cost effectiveness during the budget review process and subsequent public discussion. Mitigation actions listed in this plan are generally selected based on their benefits weighed by their cost, relative to less advantageous alternative options. However, some of the smaller municipalities; when other funding sources are not readily available, may still have to defer the projects until the funds are available. New standards help ensure that that current and future infrastructure projects are mitigated against hazards profiled in this plan for longer periods of time. This review is at least equal to a formal cost-benefit calculation because each expenditure item will be carefully scrutinized rather than simply being plugged into a formula. For purposes of grant applications however, MEMA and the County EMA have made it clear to local officials that a formal cost-benefit analysis will have to be prepared in the event they apply for mitigation funding.

**Timeframe.** Some of the projects have been completed, as indicated in the table of projects. Some are newly listed. However, the vast majority of projects are carry-overs from the last plan update, so an approximate time frame has been assigned to each project, subject to the

## Kennebec County Hazard Mitigation Plan – 2021 Update

availability of funds which, in most cases, have not been secured as of this writing. The time frames start when funding becomes available and permitting is completed.

- Short Term: 1-2 years
- Medium Term: 3-4 years
- Long Term: 5 years

Municipal inaction to date does not mean lack of interest. Most municipalities do not have the funds to implement the projects, in part because scarce municipal resources are dedicated to winter and summer road maintenance, school costs and county budgets, to name a few, and municipal finances are also being squeezed by state funding cutbacks in revenue sharing, education, county jails and other areas of government.

The time frames set forth in this plan are subject to change if circumstances improve and funding sources become available.

**Status.** The projects were initially included in the Plan based on an expectation that there would be sufficient federal funds to help pay for many of the projects, but this has not been the case. Many municipalities simply do not have the resources to construct these projects using only local funds, and this has been indicated by the phrase “deferred, lack of funds.”

### **Potential Funding Sources**

Potential funding sources for all local projects include, but are not limited to:

- Local tax money
- MaineDOT local road assistance funds
- FEMA Hazard Mitigation Assistance (HMA) grant funds
- FEMA Homeland Security Grant Programs
- Maine Department of Environmental Protection (DEP) culvert grants
- Community Development Block Grant (CDBG) funds
- Other (e.g. private benefactors, emerging grant programs)

### **D2. Progress in Local Mitigation Efforts**

The table below reflects progress in local mitigation efforts. See status column.

### **D3. Revisions to Reflect Changes in Priorities**

The table below reflects progress in local mitigation efforts. See discussion on how projects were prioritized, page 5-13.

**Note: References to culverts on the following pages refer to upsizing or lengthening culverts, unless otherwise stated. According to Culvert Sizing Design Guidance**

approved by the Maine Department of Transportation Environmental Office in 2015 (<https://www.maine.gov/mdot/edi/docs/CulvertSizing52115.pdf>), upsizing and lengthening culverts are important mitigation practices to improve flow conditions and reduce the extent and likelihood of flood damage caused by undersized or poorly designed/maintained culverts. Similarly, projects that reference ditching and elevating roads are intended to avoid road surface flooding and associated transportation and emergency response vulnerabilities. Over the years, FEMA has established project useful life standards for typical mitigation project types. FEMA's project useful life standard for culverts ranges from 25-50 years, depending on type of materials used. Other examples are: generators - 19 years, elevations – 30 years, and acquisition/demolitions - 100+ years.

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
Albion	<b>1) Robbins Rd;</b> Ditch 2,500' and remove ledge as needed approx. 300 cu. yd.	\$17,500	Medium Term	Road Commissioner	Deferred; lack of funds
	<b>2) Harding Rd;</b> Remove ledge and install (5) 15" x 20' HDPE driveway culverts.	\$12,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>3) Quaker Hill Rd;</b> Ditch 7,500' and add (4) 18" x 40' cross culverts.	\$30,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>4) Barns Rd;</b> Ditch 10,000' and remove ledge as needed.	\$45,000	Medium Term	Road Commissioner	Deferred; lack of funds
	<b>5) Quimby Rd;</b> Ditch 10,000' and upsize (1) 24" x 40' cmp with 30"x 40' HDPE culvert, (5)12" x 40' culverts with 15" x 40' HDPE culverts and riprap intake and outlets.	\$48,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>6) Weymouth Rd;</b> Elevate 10,000' x 20' x 2' and stabilize shoulders.	\$250,000	Long term	Road Commissioner	Deferred; lack of funds
	<b>7) Yorktown Rd;</b> Ditch 5,000' and upsize existing 24" x 40' cmp with 36" x 40' HDPE culvert and riprap intake and outlet.	\$18,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>8) Cookson Rd;</b> Ditch 900' and remove ledge as needed.	\$6,000	Short Term	Road Commissioner	Deferred; lack of funds
	<b>9) Knights Road;</b> Town owned bridge needs replacement	\$TBD	Long Term	Road Commissioner	New for 2021 Plan
Augusta	<b>1) Mount Vernon Avenue Ball field;</b> Stabilize embankment with geotextile fabric and fractures stone and indigenous plantings. 1,000' x 5' x 2' on average.	\$300,000	Medium Term	Director of Public Works	\$300,000 proposed in the FY 2025 Capital Improvement Program (CIP).
	<b>2) Cuchnoc Drive at Whitey Brook;</b> Upsize existing underground drainage 12" x 400' with 18" x 400' and add (3) catch basins.	\$870,000	Long Term	Director of Public Works	\$200,000 approved in the FY2021 CIP, \$670,000 expected to be approved in the FY 2022 CIP. This includes drainage and reconstruction of the street.
	<b>3) Eastside Boat Landing;</b> Install driven sheet pile bulkhead 300'.	\$45,000	Medium Term	Director of Public Works	Dock system and rip rap installed in 2020. Area to be monitored to see if further improvements are needed.

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
<b>Augusta</b>	<b>4) Greenway Trail;</b> Pave 2,000' x 8' x 3" of multi-use trail along the Kennebec River to fix erosion that is occurring.	\$24,000	Short Term	Director of Public Works	CIP request for \$20,000 starting in FY 2023 and ongoing for four years.
	<b>5) Bond Brook Road Culvert at Mout Vernon Ave.</b>	\$80,000	Long Term	Director of Public Works	Culvert was rehabilitated by slip lining using existing Bond Brook CIP money.
	<b>6) Weeks Mill Road Culvert replacement</b>	\$40,000	Long Term	Director of Public Works	Culvert will be replaced as is and ditches stabilized using CIP money approved in FY2022 and FY 2023.
	<b>7) Front St</b>	>\$1,000,000	Long Term	Director of Public Works	In planning stages as a joint project with utility upgrades and flood impact reduction. No estimates at this point but will likely be several million.
<b>Belgrade</b>	<b>1) Bartlett Rd;</b> Upsize existing 60" x 50' cmp with 8' x 6' x 50' bottomless box culvert and rip rap intake and outlet.	\$50,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>2) Dunn Rd;</b> Ditch 1,200' and line with fractured stone, upsize 24" x 40 cmp with 36" x 40' HDPE culvert	\$16,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>3) Chandler Rd;</b> Ditch 1,200' to prevent road flooding and washouts during severe storms and spring floods	\$4,200	Short Term	Road Commissioner	Deferred; lack of funds
<b>Benton</b>	<b>1) East Benton Rd;</b> Upsize 60" x 30' cmp with 4' x 8' x 40' bottomless box culvert and elevate 150' x 21' x 2' and repave.	\$60,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>2) McCarthy Rd;</b> Upgrade twin 24" x 40' culverts. with 4' x 6' x 40' bottomless box culvert and riprap intake and outlet (dirt road. Beaver problem exacerbates flooding).	\$37,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>3) Bog Road;</b> Elevate 300' x 21' x 18" on average, armor road and shoulders.	\$15,000	Short Term	Road Commissioner	Deferred; lack of funds
	<b>4) Handscomb Rd;</b> Ditch 1,200' to prevent road flooding and washouts during severe storms and spring floods.	\$4,000	Short Term	Road Commissioner	Deferred; lack of funds
	<b>5) Foss Hill Rd;</b> Remove ledge from ditch line 2,000' x 3' x 2' and repave (Dirt road and surrounding area is very flat).	\$40,000	Short Term	Road Commissioner	Deferred; lack of funds

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
Chelsea	<b>1) Searles Mills Rd;</b> Upsize existing 12' squash culvert with 14' x 10' x 60', bottomless box culvert, riprap intake and outlet and repave.	\$75,000	Long Term	Town Manager	Ongoing
	<b>2) Beech St:</b> Upsize existing 36" x 60' culvert with 48" x 60' HDPE culvert, riprap intake and outlet and repave.	\$9,500	Long Term	Town Manager	Completed 2018
	<b>3) Wellmen Rd;</b> Upsize existing 12' squash culvert with 14' x 10' x 60', bottomless box culvert, riprap intake and outlet and repave.	\$95,000	Long Term	Town Manager	Deferred; lack of funds
China	<b>1) Parameter Rd;</b> Ditch and line with fractured stone 2,000', and add check dams as needed. Add (2) 18" x 40' HDPE culverts and riprap intake and outlets install 2 plunge pools and upsize (2) 12" x 20' cmps with 15" x 20' HDPE driveway culverts.	\$31,000	Long Term	Town Manager	Deferred; lack of funds
	<b>2) Western Ridge Rd;</b> Stabilize down slope of roadway 600' x 10' upsize (2) 12" x 40' cmps with 18" x 40' HDPE culverts add 2 plunge pools.	\$22,000	Long Term	Town Manager	Deferred; lack of funds
	<b>3) Rockwood Drive;</b> Ditch and line with fractured stone 2500', and add check dams as needed. Add (2) 18" x 40' HDPE culverts and riprap intake and outlets install 2 plunge pools and upsize (2) 12" x 20' cmps with 15" x 20' HDPE driveway culverts.	\$40,000	Long Term	Town Manager	Deferred; lack of funds
	<b>4) Hanson Rd/ Cross Rd;</b> Ditch and line with fractured stone 2,500', add (1) 15" x 20' HDPE culvert and riprap intake and outlets.	\$26,000	Long Term	Town Manager	Deferred; lack of funds
	<b>5) Pleasant View Ridge Rd;</b> Ditch and line with fractured stone 5,000' and upsize (8) 12" x 20' cmps with 15" x 20' HDPE driveway culverts.	\$58,000	Long Term	Town Manager	Deferred; lack of funds
	<b>6) Dirgo Rd;</b> Rebuild road sub base and base 3 miles, repave. Establish ditch 15,000'.	\$600,000	Long Term	Town Manager	Deferred; lack of funds
	<b>7) Branch Mill Rd;</b> Rebuild road sub base and base 3,000, repave. Ditch and line 1,200', upsize (3) 15" x 40' cmps with 18" x 40' HDPE and one (1) 15" x 40' cmp 18" x 40' HDPE culvert.	\$125,000	Long Term	Town Manager	Deferred; lack of funds



Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>8) Clark Rd;</b> Ditch and line with fractured stone 1,000', add (1) 15" x 20' HDPE driveway culvert and crown road.	\$12,000	Long Term	Town Manager	Deferred; lack of funds
	<b>9) Bog Rd;</b> Upsize existing 15" x 40' cmp with 24" x 40' HDPE culvert and riprap intake and outlet.	\$2,800	Short Term	Town Manager	Deferred; lack of funds
Clinton	<b>1) Johnson Flats Rd;</b> Elevate roadway 600' x 21' x 2' on average and stabilize shoulders with geotextile and fractured stone.	\$75,000-\$150,000	Long Term	Hwy Foreman	On-going, \$75-\$150K
	<b>2) True Rd;</b> Upsize existing 72" x 40' cmp with 12" x 8' x 40' bottomless box culvert with integrated headwalls.	\$72,000	Long Term	Hwy Foreman	June-Oct of 2022
	<b>3) Rogers Rd ;</b> Armor ditches 500' and line with fractures stone, add 8" x 20' x 4000' surface gravel, shape and crown road. (Site may have had PA funds in the past; verbiage to be added)	\$35,000	Medium Term	Hwy Foreman	Deferred; lack of funds
	<b>4) Pease Rd:</b> Add 15" x 40' HDPE culvert.	\$1,500	Short Term	Hwy Foreman	Deferred; lack of funds
Farmingdale	<b>1) 305 Water St;</b> Acquire and remove house.	\$65,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>2) Water St;</b> Farmingdale Town Hall and fire station relocate away from Kennebec River 8,000 sq'. (this is critical facility)	\$1,000,000	Long Term	Town Manager	Fire Station Completed 2019, Town hall still in place
	<b>3) Access Rd;</b> Build access road connecting Greely Drive, Hill Street, riverside Drive and Kennebec Street 1,400' x 20'. (could be part of relocating town hall and fire station – project # 2)	\$45,000	Medium Term	Town Manager	Completed for 2021 Plan
	<b>4); Northern Ave;</b> Replace existing drainage system with 1,900' x 18" underground drainage system and relocate 22 catch basins and repave.	\$165,000	Long Term	Road Commissioner	Completed for 2021 Plan
Fayette	<b>1) Richmond Mills Rd @ Hales Brook;</b> -Upgrade twin 36" x 40', CMP culverts to 4' x 6' x 40' concrete bottomless box culvert. -Ditch (200ft), rip rap and repave (multiple project worksheets – PA funds – exist for this site).	\$40,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>2) Bamford Hill Rd;</b> Elevate 1,000' x 2' x 24' stabilize shoulders and add (2) 24" x 40' HDPE culverts and rip rap outlet and intake.	\$47,000	Long Term	Town Manager	Deferred; lack of funds

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>3) Jackman Mill Rd;</b> Upsize 60" x 40' cmp with 5' x 6' x 40' bottomless box culvert with integrated headers.	\$38,000	Long Term	Town Manager	Deferred; lack of funds
	<b>7) Asa Hutchison Hill Road;</b> 500 Feet of shoulder and pave road	\$50,000	Long Term	Town Manager	Deferred; lack of funds
<b>Gardiner</b>	<b>1) Marston Rd site 1;</b> Install 600' x 15" HDPE underground drainage culvert add two catch basins and upsize existing 36" x 40' cmp with 60" x 40' HDPE culvert and riprap intake and outlet.	\$40,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>2) Marston Rd site 2;</b> Elevate 600' x 20' x 3' on average, repave and upsize existing 24" x 50' HDPE culvert with 5' x 4' x 50' bottomless box culvert.	\$50,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>3) Marston Rd site 2;</b> Elevate 200' x 20' x 2' on average, repave and upsize existing 24" x 50' and 36" x 50' HDPE culvert with 6' x 4' x 50' bottomless box culvert.	\$45,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>4) Marston , Libby Hill and Costello Rd;</b> Elevate 3,000' x 20' x 4' on average, repave and upsize existing 36" x 50' HDPE culvert with 6' x 4' x 50' bottomless box culvert add 36" x 50' HDPE overflow culvert.	\$90,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>5) Riverside Drive site 1;</b> Upsize 24" x 40'.cmp with 36" x 40' HDPE culvert and riprap intake and outlet. Ditch and line 500' and stabilize downstream road shoulder 150' x 3'.	\$12,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>6) Riverside Drive site 2;</b> Upsize and reset 36" x 40' cmp with 36" x 40' HDPE culvert and tow and pave 100' x 20' low water crossing.	\$7,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>7) Harden Hill Rd;</b> Install 400' x 24" underground drainage.	\$24,000	Long Term	Director of Public Works	Completed for 2021 Plan
	<b>8) Summer St;</b> Construct concrete berm behind garage on private property. 20' x 3' x 12".	\$2,500	Medium Term	Director of Public Works	Completed for 2021 Plan
	<b>1) Water St. @ Second St. (drainage);</b> Upsize 300' x 24" underground pipe. Add (6) catch basins.	\$100,000	Long Term	Director of Public Works	Completed for 2021 Plan
	<b>2) Union St. @ Central St;</b> (drainage) Upsize 300' x 24" underground pipe. Add (10) catch basins.	\$65,000	Long Term	Director of Public Works	Completed for 2021 Plan
	<b>3) Chestnut St;</b> (drainage) Upsize 200' x 18" underground pipe. Add (4) catch basins.	\$30,000	Long Term	Director of Public Works	Completed for 2021 Plan

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
Hallowell	<b>4) Academy St;</b> (drainage) Upsize 1,000' x 24" underground pipe. Add (10) catch basins.	\$110,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>5) Central Street;</b> upsize culvert 30' x 6'.	\$100,000	Long Term	Director of Public Works	Completed for 2021 Plan
	<b>6) Lincoln Street from Hubbard Lane to Second Street (drainage);</b> Upsize 2,000' x 18" underground pipe. Add (6) catch basins.	\$100,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>7) High Street from Central Street to Mayflower Road (drainage);</b> Upsize 500' x 18" underground pipe. Add (5) catch basins.	\$65,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>8) Page Street from Pleasant Street to Second Street (drainage);</b> Upsize 1,500' x 18" underground pipe. Add (6) catch basins.	\$85,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>9) Vaughn Road Bridge</b> Replace bridge	\$100,000	Long Term	Director of Public Works	New for 2021 Plan
Litchfield	<b>1) Hallowell/Litchfield Rd;</b> Build retaining wall 4ft x 50' to protect road from Tacoma Lake overspill.	\$28,000	Short Term	Town Manager	Deferred; lack of funds
	<b>2) Woodbury Pond Dam; repairing face of dam</b>	\$100,00	Long Term	Town Manager	New for 2021 Plan
Manchester	<b>1) Area of 400 Prescott Road</b> Replace and upsize two culverts with improve riprap that transfer water from one side of the road to the other	\$56,000	Medium Term	Town Manager/Road Commissioner	Added for 2021 plan, assessing to complete in the next couple of years
	<b>2) Kennison St</b> Repair and replace a triple culvert to a box covert that floos every year	\$56,000	Medium Term	Town Manager/Road Commissioner	Added for 2021 plan, assessing to complete in the next couple of years
Monmouth	<b>1) Wilson Pond Rd, site 1;</b> Add 36" x 40' HDPE overflow culvert and riprap intake and outlet.	\$4,000	Long Term	Town Manager	Deferred; lack of funds
	<b>2) Sandborn Rd;</b> Add 36" x 50' HDPE overflow culvert and riprap intake and outlet.	\$5,000	Long Term	Town Manager	Deferred; lack of funds
	<b>3) Placard Rd, site 1;</b> Ditch and stone line 1,500' and add check dams as needed.	\$15,000	Short Term	Town Manager	Deferred; lack of funds
	<b>4) Placard Rd, site 2;</b> Add (2) 30" x 40' HDPE cross culverts and riprap intake and outlets.	\$6,000	Short Term	Town Manager	Deferred; lack of funds

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>5) Wilson Pond Rd, site 2;</b> Add 36" x 40' HDPE overflow culvert and riprap intake and outlet.	\$4,000	Short Term	Town Manager	Deferred; lack of funds
	<b>6) Bormen Rd;</b> Add 36" x 50' HDPE overflow culvert and riprap intake and outlet.	\$5,000	Short Term	Town Manager	Deferred; lack of funds
	<b>7) Gillman Hill Rd;</b> Ditch and stone line 1,200' and add check dams as needed.	\$12,000	Short Term	Town Manager	Deferred; lack of funds
<b>Mount Vernon</b>	<b>1) Bean Rd;</b> Add 36" x 40' HDPE overflow culvert, Moor Hill Rd. elevate 600' x 20' x 1' and stabilize shoulders, upsize 36" x 40' cmp with 48" x 40' HDPE culvert and (2) 15" x 40' cmps with 24" x 40' HDPE culverts.	\$27,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>2) Journeys End ;</b> Elevate 400' 21' x 2', stabilize shoulders and upsize (2) 15" x 40' culverts with 24" x 40' HDPE culverts.	\$23,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>3) Desert Point Rd;</b> Elevate 1,000' x 21' x 2', stabilize shoulder upsize (3) 15" x 40' cmps with 36" x 40' HDPE culverts and add (3) 36" x 40' HDPE overflow culverts.	\$75,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>4) Desert Pond Road;</b> 800ft of widening and ditching	\$150,000	Long Term	Road Commissioner	New for 2021 Plan
	<b>5.) Gordon Road;</b> ¾ of a mile of widening and ditching	\$100,000	Long Term	Road Commissioner	New for 2021 Plan
<b>Oakland</b>	<b>1) Broom Handle Rd; 9</b> Upsize (3) culverts; sizes unknown Ditch 75'.	\$25,000	Long Term	Road Commissioner	Deferred; lack of funds
<b>Pittston</b>	<b>1) Blinn Hill Rd;</b> Upsize and lengthen existing culvert with a 10'x 14' x 50' bottomless box culvert with integrated headwalls.	\$105,000	Long Term	Board of Selectmen	Completed for 2021 Plan
	<b>2) Pinkham St;</b> Elevate road bed 1,800' x 3' x 20' on average, stabilize shoulders with fractured stone, upsize (2) 15" x 40' cmps with 18" x 40' HDPE culverts and (1) 12" x 20' cmp. With 18" x 20' HDPE driveway culvert and remove ledge from ditch line as needed approx. 75 cu yds.	\$145,000	Long Term	Board of Selectmen	Deferred; lack of funds

## Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>3) Blodgett Rd;</b> Upsize 8'x 40' oval culvert with 10' x 8' x 40' bottomless box culvert and riprap intake and outlet.	\$65,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>4) Palmer Rd;</b> Ditch 4,000 and remove ledge as needed and add (2) 18" x 40' HDPE cross culverts.	\$20,000	Long Term	Board of Selectmen	Completed for 2021 Plan
	<b>5) Crocker Rd;</b> Ditch and stone line 4,000' to prevent road flooding and washouts during severe storms and spring floods.	\$43,000	Short Term	Board of Selectmen	Deferred; lack of funds
<b>Randolph</b>	<b>1) Water St;</b> Remove fire station 3,800 +/- sq ' and remove Public Works Garage 1,200+/-sq ' out of the flood plain (critical facility).	\$350,000	Long Term	Board of Selectmen	Deferred; lack of funds (In works to start soon)
	<b>2) Lower Water St;</b> Acquire and demolish 9 properties from the flood plain.	\$2.5 mill	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>3) Mill St;</b> Create hardened low water crossing 500' x 23'.	\$25,000	Short Term	Road Commissioner	Deferred; lack of funds
<b>Readfield</b>	<b>1) Sadie Dunn Rd;</b> Upsize 36" x 50' cmp with 48" x 50' HDPE riprap intake and outlet and ditch and line 500' of road and add check dams as needed.	\$18,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>2) Giles Rd;</b> Replace bridge 21' x 35'.	\$165,000	Long Term	Director of Public Works	Deferred; lack of funds
	<b>3) Wings Mills Rd;</b> Upsize existing twin 24" x 50' culverts with 4' x 6' x 50' bottomless box culvert with integrated headwalls.	\$50,000	Long Term	Director of Public Works	Deferred; lack of funds
<b>Rome</b>	<b>1) Ladd Rd;</b> Ditch 6,500', elevate 7,500' x 18' x 10" on average and upsize (6) 12" x 40' cmps with 18" x 40' HDPE culverts.	\$225,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>2) Watson Pond Rd;</b> Ditch 2,000' upsize (1) 12" x 40' cmp with 18" x 40' HPDE culvert and (2) 12" x 20' driveway cmps with 15" x 20' HDPE culverts and riprap intake and outlets.	\$11,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>3) Oak Ridge Rd;</b> Elevate 4,000' x 18' x 12" on average, ditch 600' and add (3) 18" x 40' HDPE cross culverts.	\$55,000	Long Term	Road Commissioner	Completed for 2021 Plan

## Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>4) Jamaica Point Rd;</b> Ditch and line 500' and remove ledge as needed.	\$7,500	Short Term	Road Commissioner	Completed for 2021 Plan
	<b>5) Mountain Drive:</b> Install (2) dry hydrants with 200' x 6" and 600' x 6" PVC.	\$6,000	Short Term	Road Commissioner	Completed for 2021 Plan
	<b>6) Drury Lane;</b> Upgrade shoulders with pavement aggregate 16'x3,600' along road to reduce chance of washout and repave	\$78,500	Short Term	Road Commissioner	New for 2021 Plan
	<b>7) Ladd Road;</b> Grade and pave 20' x 1,920 gravel road to improve irrostion protection	\$50,397	Long Term	Road Commissioner	New for 2021 Plan
	<b>8.) Oak Ridge;</b> Grade and pave 20' x 1,800 gravel road to improve irrostion protection	\$47,480	Long Term	Road Commissioner	New for 2021 Plan
<b>Sidney</b>	<b>1) Drummond Rd;</b> Upsize (2) 24" x 40' culverts to 4' x 8' x 40' bottomless box culvert. Stabilize road shoulders with gabion baskets 100' x 3' x 18'.	\$65,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>2) Quaker Rd;</b> Ditch 1,400' and upsize (13) 15" x 30' and (2) 18" x 30' driveway cmps with (13) 24" x 30' HDPE and (2) 24" x 40' HDPE culverts.	\$58,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>3) Reynold Hill Rd;</b> Ditch 2,500', stone line and add check dams as needed. Upsize (10) 12" x 30' driveway cmps with (10) 18" x 30' HDPE culverts and add (5) 18" x 30' HDPE driveway culverts and upsize existing 12" x 115' cmp with 18" x 115 HDPE culvert.	\$74,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>4) Mills Rd;</b> Elevate road bed 3,000' x 2' x 20' and stabilize shoulders to prevent road flooding and washouts during severe storms and spring floods.	\$55,000	Medium Term	Board of Selectmen	Deferred; lack of funds
	<b>5) Philbrook, Tiffany, Blake Rds;</b> Elevate road bed 12,000 x 2' x 21' stabilize shoulders. Upsize (9) 15" x 40' to 18" x 40' HDPE culverts and add (3) 18" x 40' HDPE cross culverts.	\$260,000	Long Term	Board of Selectmen	Deferred; lack of funds
<b>Unity Township</b>	<b>1) Flail Mowing;</b> Maintain trees along roadways to limit growth and promote better drainage	\$1,000	Short Term	Board of Supervisors	Deferred, lack of funds
<b>Vassalboro</b>	<b>1) Bog Rd;</b> Upsize 15" x 40' cmp to 24" x 40' HDPE culvert (problem may be a result of a farmer's man-made pond).	\$3,000	Short Term	Public Works	Completed for 2021 Plan

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>2) Midget Hill Rd;</b> Ditch and stone line 400' and add check dams as needed.	\$6,000	Short Term	Public Works	Completed for 2021 Plan
	<b>3) Cook Hill Rd;</b> Ditch and stone line 300' and add check dams as needed to prevent road flooding and washouts during severe storms and spring floods.	\$5,000	Short Term	Public Works	Deferred; lack of funds
	<b>4)Dunham Rd;</b> Ditch and seed 200'.	\$1,100	Short Term	Public Works	Completed for 2021 Plan
Vienna	<b>1) Town Rd;</b> Elevate 500' x 20' x 2' on average install 10' x 4' x 40' bottomless box culvert riprap intake and outlet and repave .	\$60,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>2) Mountain Rd;</b> Upsize existing cmp with 8' x 4' x 40' bottomless box culvert and riprap intake and outlet.	\$45,000	Long Term	Road Commissioner	Ongoing, waiting on additional funding
	<b>3) Kimble Pond Rd site 1;</b> Add 24" x 40' HDPE culvert .	\$2,000	Long Term	Road Commissioner	Deferred; lack of funds
	<b>4) Kimble Pond Rd site 2;</b> Add 4' x 3' x 40' bottomless box culvert riprap intake and outlet and elevate road bed 200' x 20' x 2'.	\$25,000	Long Term	Road Commissioner	Completed for 2021 Plan
	<b>5) Stream Rd;</b> Add 24" x 60 ' HDPE overflow culvert and riprap intake and outlet.	\$4,000	Short Term	Road Commissioner	Deferred; lack of funds
	<b>6) Trask Road;</b> Upgrade five culverts 6x65' with rock work	\$35,000	Short Term	Road Commissioner	New for 2021 Plan, Planning process ongoing
Waterville	<b>1) Drummond Rd;</b> Ditch 2,300' and reset 18" x 50' culvert.	\$9,200	Short Term	Public Works	Deferred; lack of funds
	<b>2); County Rd;</b> Riprap intake and outlet of existing 48" culvert and add 4' x 6' x 6' stone lined plunge pool.	\$4,000	Short Term	Public Works	Completed culvert replacement, unable to fund plunge pool
	<b>3) West River Rd;</b> Upsize 18" x 100' culvert with 3' x 2' x 100' bottomless box culvert.	\$45,000	Long Term	Public Works	Deferred; lack of funds
	<b>4) West River Rd at Abenaki;</b> culvert upsize and ditching required to mitigate ongoing drainage issues during heavy rains.	\$7,000	Short Term	Public Works	New for 2021 Plan
	<b>5) Paul Ave;</b> assess and mitigate ongoing drainage issues during heavy rains	\$35,000	Short Term	Public Works	New for 2021 Plan
	<b>6) Eight Rod Rd;</b> culvert replacement time 2 and upsize to boxed or bottomless style.	\$90,000	Long Term	Public Works	New for 2021 Plan

Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
	<b>7) Upper Main Street;</b> culvert upsize and replacement.	\$10,000	Short Term	Public Works	New for 2021 Plan
<b>Wayne</b>	<b>1) Hardscrabble Road:</b> Widen road and improve drainage for additional distance of 1 mile.	\$10-15,000	Long Term	Town and Contractor	Defered, lack of funds
	<b>2) House Road:</b> Improve drainage and rip rap for distance of 1/2 mile, still in need of coiffer dams	\$22,000	Long Term	Town and Contractor	Deffered, lack of funds
	<b>3) Dexter Pond Road:</b> Widen road and improve drainage for distance of ½ mile prevent road flooding and washouts during severe storms and spring floods	\$30,000	Long Term	Town and Contractor	Deffered, lack of funds
	<b>4) Temy Bridge:</b> Culvert that allows water to pass from Berry Pond to Wilson Pond is in need of replacement. Mt Pisgah Road passes over culvert.	\$100,000+	Long Term	Town and Contractor	New for 2021 Plan
<b>West Gardiner</b>	<b>1) Indiana Rd ;</b> Elevate 900' x 22' x 2' on average and repave, Upsize 15" x 40' cmp to 24" x 40' HDPE culvert.	\$38,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>2)Stoneham Drive site 1;</b> Replace 24" x 40' cmp with 24" x 40' HDPE culvert and remove ledge 36" x 40' x 24" and reset 24" x 40' culvert.	\$6,500	Long Term	Board of Selectmen	Deferred; current culvert working well. Will replace with upgraded culvert wieh required
	<b>3) Bog Hill Rd;</b> Upsize 48" x 40' cmp with 4' x 6' x 40' bottomless box culvert and elevate 500' x 22' x 2' and repave.	\$48,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>4) Old Lewiston Rd;</b> Stabilize 500' x 4' with geotextile fabric and fractured stone and upsize existing 18" x 40' cmp with 24" x 40' HDPE culvert.	\$6,000	Short Term	Board of Selectmen	Deferred; current culvert working well. Will replace with upgraded culvert wieh required
	<b>5) Stoneham Drive site 2;</b> Elevate 2,000' x 22' x 2' and upsize (10) 12" x 30' cmps with 18" x 30' HDPE driveway culverts.	\$67,000	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>6) Benson Rd;</b> Upsize 15" x 40' cmp with 24" x 40' HDPE culvert.	\$2,600	Long Term	Board of Selectmen	Deferred; lack of funds
	<b>7) Hinkley Rd;</b> Elevate 1,000' x 22' x 12" and upsize 12" x 40' cmp with 18" x 40' HDPE culvert.	\$76,000	Long Term	Board of Selectmen	Deferred; current culvert working well. Will replace with upgraded culvert wieh required



Kennebec County Hazard Mitigation Plan – 2021 Update

Town (Kennebec County)	Potential Projects	Cost estimate	Time-frame	Responsible Agency	Status
Winslow	<b>1) Fort Hill Cemetery:</b> Stabilize slope of cemetery 80' x 90' x 2' with large fractured stone.	\$200,000	Medium Term	Town Manager	Deferred; lack of funds
	<b>2) Lithgow St;</b> Add 24" x 4000' HDPE underground drainage culvert +/- to Chafe Brook.	\$250,000	Long Term	Town Manager	Deferred; lack of funds
Windsor	<b>1) Griffin Rd;</b> Ditch 10,000' remove ledge as needed 50 cu yds +/- in two spots, add (3) 18" x 40' HDPE cross culverts and rip rap intake and outlets.	\$42,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>2) Choate Rd at Choate Bridge;</b> Stabilize road shoulder 20' x 10' with geotextile fabric and fractured stone, Ditch and line 1,000' and add check dams as needed. Upsize (1) 12" x 20' cmp with 15" x 20' HDPE driveway culvert.	\$15,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>3) Wingood Rd;</b> Elevate 3,000' x 16' x 12", add (3) 18" x 40' HDPE cross culverts and (1) 15" x 20' HPDE driveway culvert. And riprap intake and outlets.	\$24,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>4) Reed Rd;</b> Cut back road banks 5' and ditch 5,000'.Add (3) 15" x 40' HDPE culverts and upsize (2) 18" x 40' cmps with 30" x 40' HDPE culverts.	\$33,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>5) Weeks Mill Rd;</b> Replace 96" x40' cmp with 10' x 8' x 50' bottomless box culvert and riprap intake and outlet.	\$65,000	Long Term	Town Manager	Completed for 2021 Plan
	<b>6) Choate Road Bridge;</b> widen bridge	\$500,000	Long Term	Town Manager	New for 2021 Plan
Winthrop	<b>1) Memorial Drive;</b> Re-ditch and stone line 300'.	\$3,000	Short Term	Town Manager	Completed for 2021 Plan
	<b>2) Case Rd;</b> Upsize 36" x 40' cmp with 4' x 4' x 40' concrete bottomless box culvert, riprap intake and outlet. Add 24" x 40' HDPE overflow culvert.	\$25,000	Long Term	Town Manager	Deferred; lack of funds
	<b>3) Old Lewiston Rd;</b> Upsize existing culvert. 48" x 40' with 5'x 4' x 30' bottomless box culvert.	\$40,000	Long Term	Town Manager	Deferred; lack of funds
	<b>North Wayne Road;</b> 16x40 Bridge in need of replacement	\$300,000	Long Term	Highway Foreman	New for 2021 Plan

## SECTION 6 PLAN MAINTENANCE PROCEDURES

### **Monitoring, Evaluating and Updating the Plan**

**Requirement §201.6(c)(4)(i):** (The plan shall include a plan maintenance process that includes) a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

**§201.6(c)(4)(i)** requires a formal plan maintenance process to take place to ensure that the Mitigation Plan remains an active and pertinent document. The plan maintenance process includes a schedule for monitoring and evaluating the plan at least every five years and continued public participation throughout the plan maintenance process.

This section also includes an explanation of how the county and municipal governments intend to incorporate their mitigation strategies into any existing planning mechanisms they have.

Eighteen months prior to the Hazard Mitigation Plan update deadline, Kennebec County Emergency Management Agency will organize a Hazard Mitigation Planning Committee meeting. Kennebec County EMA will invite the public, Town Managers, Selectmen, EMA directors and other interested parties to participate.

The Hazard Mitigation Planning Committee will review existing hazards of concern and determine whether any significant new hazards were presented throughout the past four years. The status of current mitigation projects will be updated, and new projects will be added as needed. Once all hazards, projects, maps and county information have been updated, the Kennebec County Hazard Mitigation Plan draft will be submitted to MEMA for review and recommendations before the final draft is forwarded to FEMA for conditional certification.

### **Monitoring the Plan**

Kennebec County has developed a method to ensure that regular review and update of the Hazard Mitigation Plan occurs. Progress on the plan will be monitored via monthly meetings with MEMA and/or local EMA meetings. On an annual basis, Kennebec County EMA will meet with EMA directors to conduct a risk assessment and project review. The County EMA Office is responsible for contacting team members and organizing a formal review meeting. Generally, EMA directors are responsible for monitoring and evaluating the progress of the mitigation strategies in the plan.

The County also intends to work with MEMA officials, local units of government and others in periods following disasters to better understand how the region can mitigate future damages to roads, critical facilities, residential structures and businesses. The mitigation plan and project development process will also be addressed at each disaster briefing and federal declaration kick-off meeting and will be promoted via email announcements, meetings and website information regarding application development workshops and grant application deadlines.

## Evaluating the Plan

After every disaster in the county, and/or annually, Kennebec County EMA, in consultation with the Planning Team, will review the hazards contained in the risk assessment section of the plan, as well as the strategies contained in the strategy section, to determine their relevance to changing situations and land developments in the County, as well as changes in State or federal policy, and to ensure that they are addressing current and expected conditions.

## Updating the Plan

The plan will be updated every five years. The method for determining what changes might be necessary will be to review and assess information gathered from disaster declarations, unusual weather events and/or significant changes in science or legislation. As previously described, part of that schedule will be reviews on a monthly basis and after disasters, but in the fourth year of the plan, a more in-depth review will take place, and the plan will be updated accordingly.

<b>Incorporating Mitigation into other Planning Mechanisms</b>	
<b>Requirement §201.6(c)(4)(ii):</b> (The plan shall include a plan maintenance process that includes) a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	
Element	C6. Does the plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?

## Identification of Local Planning Mechanisms

County government is very limited in scope and authority in the State of Maine and does not guide and control planning or development within its borders. Within Maine, most government authority is with State statutes and rules and with municipal “Home Rule” ordinances.

Municipalities in Kennebec County have already incorporated strategies recommended by or consistent with this Plan. By adopting this plan, each community, as well as Kennebec County, is agreeing to continue implementation of strategies aimed at mitigating hazards identified in this Plan.

In addition to the regular public meetings of their boards of selectmen, all municipalities in Kennebec County hold annual town meetings or council meetings which are an integral part of public planning. These meetings allow all citizens equal opportunity to communicate their concerns and opinions on the state of the community and how to move forward with these concerns. The citizens in attendance at these meetings have a vested interest in their community and its particular needs and how those are funded annually.

## Kennebec County Hazard Mitigation Plan - 2021 Update

Available planning mechanisms at the municipal level, and the extent to which they have incorporated hazard mitigation, include:

- **Local flood plain management ordinances;** as documented in Section 5, all 29 Kennebec County municipalities have joined the Flood Insurance Program and have adopted floodplain management ordinances aimed at managing development in flood-prone areas. In addition, Unity Township is in the Flood Insurance Program by virtue of being under the regulatory jurisdiction of the State's Land Use Planning Commission.
- **Shoreland zoning ordinances;** all of the municipalities in Kennebec County are required to have a shoreland zoning ordinance, whether adopted by the municipality or imposed by the Maine Department of Environmental Protection. Shoreland zoning ordinances contain requirements for locating structures outside of known flood hazard areas and/or for complying with the requirements of municipal flood plain management ordinances.
- **Local comprehensive plans** (most Kennebec County municipalities have adopted a comprehensive plan): Comprehensive plans are policy documents that address a wide range of issues affecting the future of the community, and those relating to public safety and environmental protection would be consistent with the strategies contained in this plan. In general, local comprehensive plans do not include recommendations on specific projects, although they may contain recommendations that roads and their associated infrastructure be upgraded as funds become available.
- **Capital improvement plans:** some of the larger municipalities have capital improvement plans; most of the smaller ones do not, but they do have local budgeting processes which are used to examine potential expenditures in detail and establish overall spending priorities.
- **Road maintenance planning efforts:** These may include priorities for local improvements, but not necessarily engineering studies or formal cost benefit analyses.
- **Emergency management and mitigation planning:** All but four municipalities have a local EMA director.
- **Fire prevention planning and coordination:** this includes participation in mutual aid agreements and multi-town wildfire training exercises, and:
- **Grant writing:** many of the County's municipalities have been active in applying for grants to address municipal priorities.

**Note: See Strategy section of this plan for a town-by-town summary of existing authorities, policies, programs and resources available to accomplish hazard mitigation.**

There were very few ordinance-related mitigation measures identified by the Kennebec County Hazard Mitigation Planning Team. The majority of the mitigation measures that were identified, and all of the actions selected by individual communities are structural projects.

### **Process for Incorporating Mitigation Strategies and Related Information into Local Planning Mechanisms.**

County government does not have the authority to control local planning mechanisms. However, the County EMA Director can provide information to local units of government, as well as technical assistance.

Following approval of the Plan by FEMA, the County EMA will send a copy to all municipalities in the County with a recommendation that local comprehensive planning efforts, municipal road maintenance planning efforts, emergency management programs and local fire prevention programs be utilized to their greatest extent to complete the community's mitigation measures.

The County EMA Office will continue to assist municipalities with the completion of FEMA Hazard Mitigation Assistance (HMA) applications.

### **Explanation of How Local Governments Incorporated Strategies and other Information.**

In addition to the planning mechanisms discussed above, there has been implementation progress in some additional areas, but no known actions in other areas:

- Comprehensive plans – no State money for new plans or updates
- Road maintenance planning efforts – many municipalities in Kennebec County are now using MEMA's Road Tracker to document repair costs
- Emergency management and mitigation planning – municipalities with dams have Emergency Action Plans (EAPs) that must be updated every two years
- Ordinances – while there is no State money for new plans or updates, municipalities have previously enacted ordinances which are now in place
- Grant applications – a few of the County's municipalities have been active in applying for and receiving grants to address mitigation issues

The County EMA has notified municipal EMAs and local officials whenever HMA grant funds have become available and whenever hazard mitigation workshops have been scheduled, such workshops with hazard mitigation content such as those sponsored by Maine's Local Roads Center that deal with the use of geo-textiles.

Since overall economic development has been sluggish throughout the county since the recession of 2008, there have been few large economic development projects. Municipalities have not had to implement many of the strategies found in this plan and often focus on the renovation of existing structures instead of building new infrastructure. While municipalities incorporate many strategies for flood mitigation, some municipalities are

Kennebec County Hazard Mitigation Plan - 2021 Update

willing to accept the risk to continue to develop areas that are in flood zones. Currently, the Augusta Downtown Alliance is continuing to work on the development of Water Street that has a history of flooding; i.e., the flood of 1987. Augusta continues to develop this area because it is cost prohibitive to attempt to move the infrastructure and businesses to a different development area in the city. Additionally, many municipalities have historic districts that, like Augusta, that are with-in the flood zone and are actively preserved. New development projects are strongly discouraged within flood zones, but some municipalities would rather develop in the flood zone for increased revenue due to being an attractive location to investors. Efforts are often focused on early detection and notification instead.

<b>Continued Public Participation</b>	
<b>Requirement §201.6(c)(4)(iii):</b> (The plan shall include a plan maintenance process that includes) a discussion on how the community will continue public participation in the plan maintenance process.	
Element	A5. Is there discussion on how the community(ies) will continue public participation in the plan maintenance process?
	A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)?

Kennebec County is dedicated to involving the public directly in the continual reshaping and updating of the Hazard Mitigation Plan. The Hazard Mitigation Planning Team is responsible for monitoring, evaluating, and updating the plan. Although the Team represents the public to some extent, the public will be able to directly comment on and provide feedback about the plan. All meetings will continue to be open to the public for opportunities to comment on and provide meaningful input on the Plan.

Copies of the plan will be provided to the municipal Emergency Management Directors and kept on hand at all municipal town offices in the County. The existence and location of these copies will be publicized by public notice in the local newspapers and/or on our website. Contained in the plan is the address and phone number of the Kennebec County EMA Office, which is responsible for keeping track of public comments on the plan.

A public meeting will also be held prior to submitting the Plan for FEMA review. This public meeting will provide one more opportunity for expressing concerns, opinions, or ideas about the plan. The County EMA Office will publicize and host this meeting.

In Kennebec County, hazard mitigation has a broader meaning than just a written plan. It is an important part of the overall mission of the Kennebec County Emergency Management Agency (EMA), and is fully integrated into the comprehensive nature of the EMA's emergency management responsibilities. Most of the EMA's activities and communications emphasize the importance of planning, preparation, mitigation, training, and emergency response. A partial list of EMA's public outreach efforts includes:

- Maintaining and updating the EMA's website including public information materials;

## Kennebec County Hazard Mitigation Plan - 2021 Update

- Maintaining existing emergency communications systems and/or upgrading to new systems;
- Participating in flood advisory/ice jam meetings for local officials and citizens along the Kennebec River;
- Holding meetings and training sessions with local EMA officials;
- Holding exercises with local fire departments and drills with local hospitals;
- Providing current information to local officials;
- Coordinating and serving two Community Emergency Response Teams;
- Participating in public outreach efforts such as the annual Maine Preparedness Conference;
- Monthly meetings with MEMA staff and the other 15 County EMA Directors;
- One-on-one meetings with local officials and interested citizens.





Kennebec County Emergency Management Agency  
77 Winthrop Street, Augusta, Maine 04330  
Office Phone: (207) 623-8407  
E-Mail: [kcema@kcema.org](mailto:kcema@kcema.org)

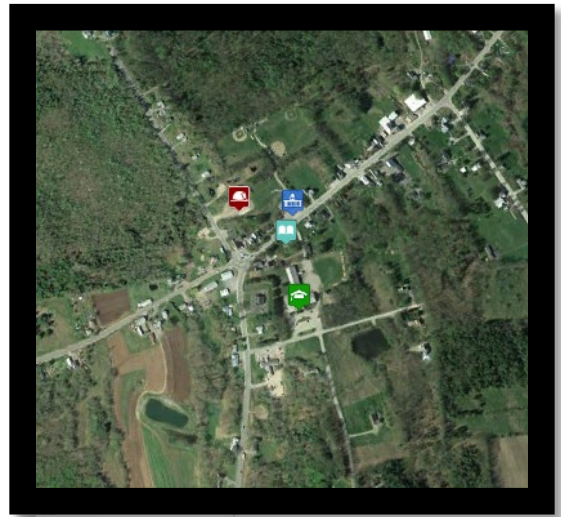
# 2021 KENNEBEC COUNTY MITIGATION MAPS



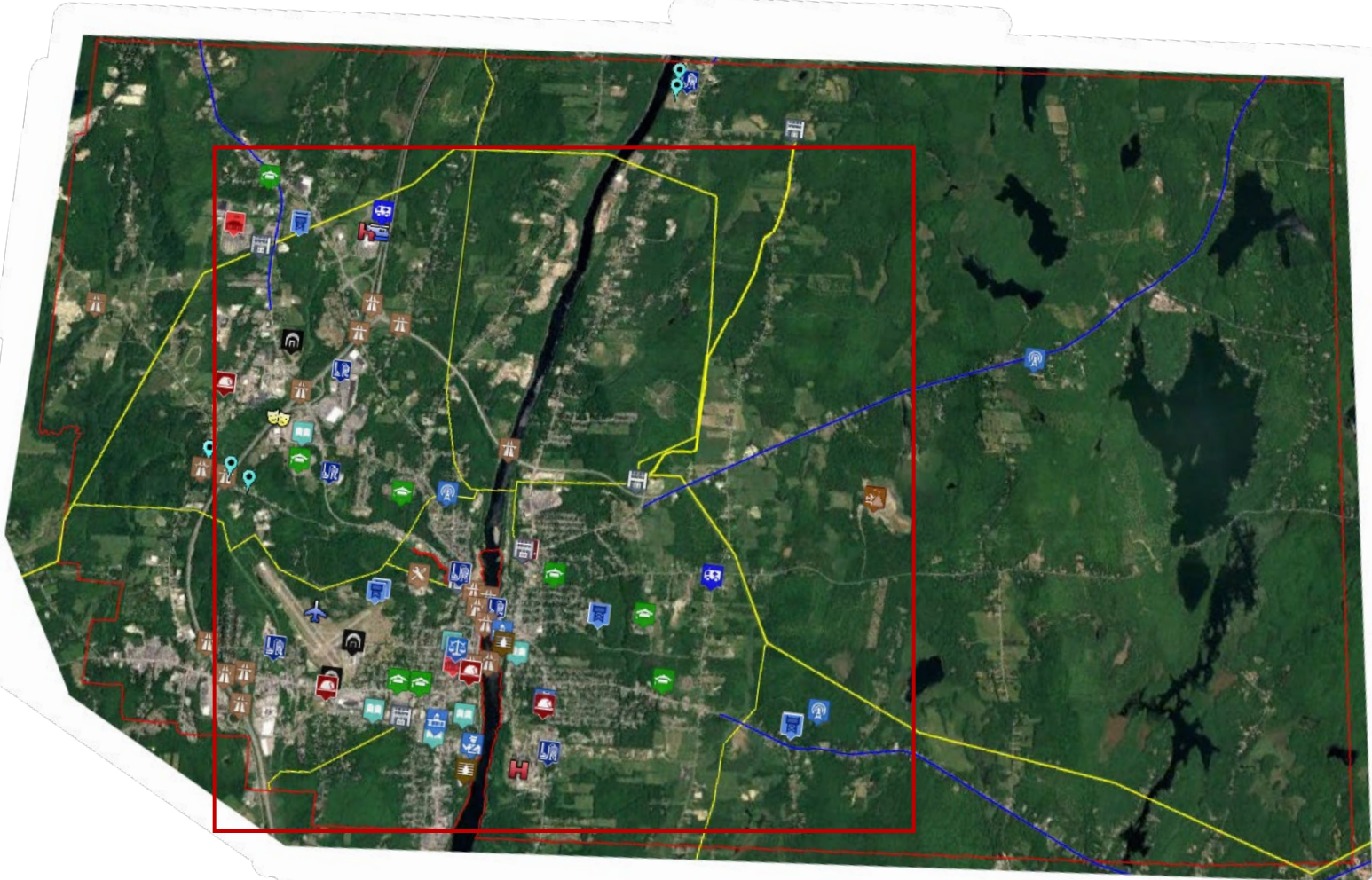


# ALBION

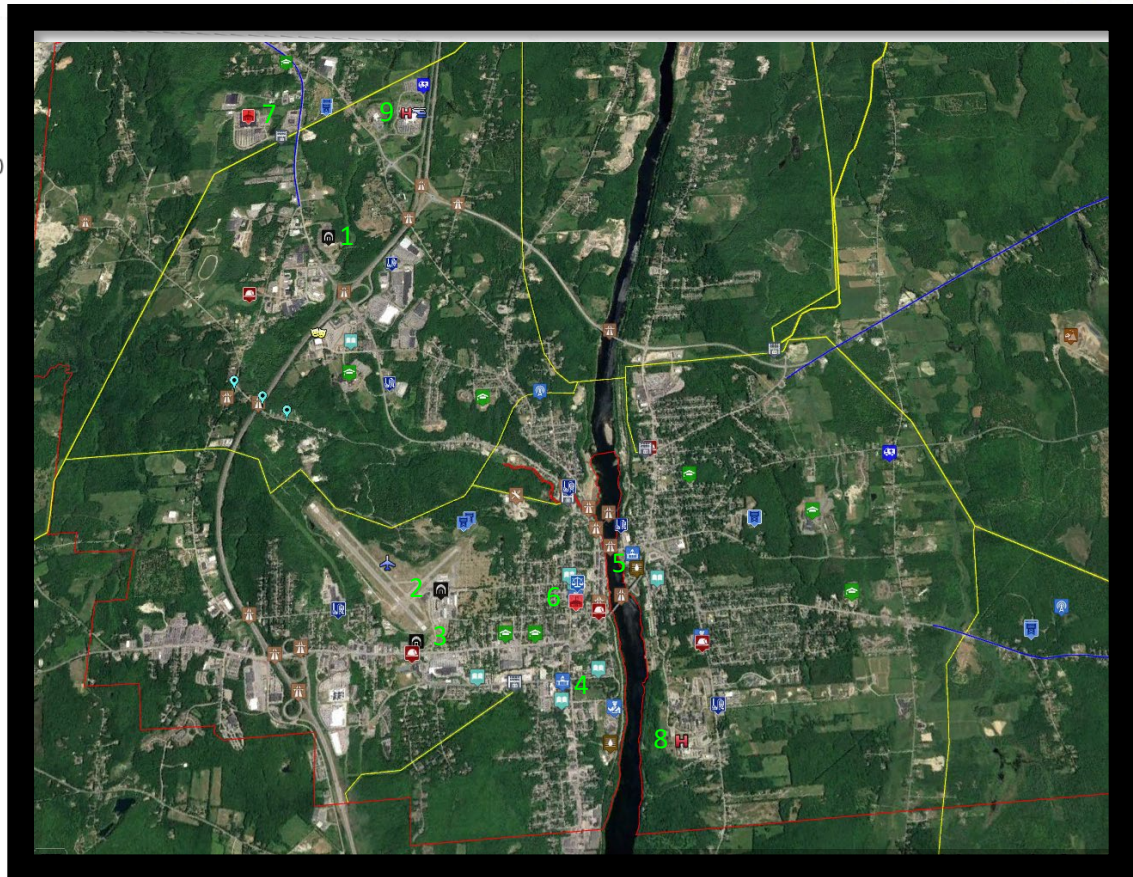
-  CITY/TOWN OFFICE
-  FIRE STATION
-  SCHOOL
-  LIBRARY
-  BRIDGE
-  POWER LINES



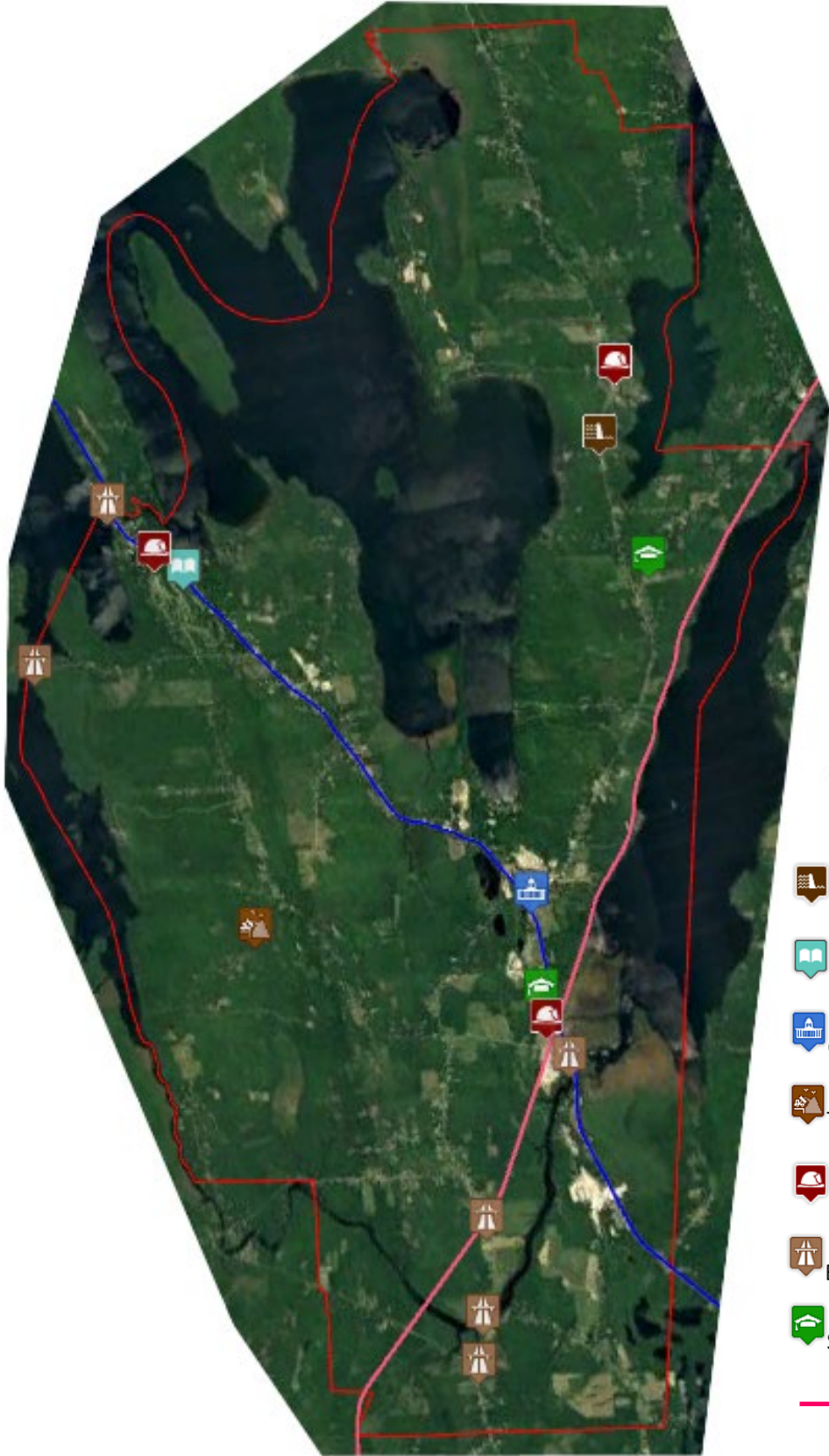
# CITY OF AUGUSTA











- AIRPORT
- LIBRARIES
- CIVIC CENTER
- CAMP CHAMBERLIN (1)  
CAMP KEYS (2)  
AUGUSTA ARMORY (3)
- CELL/RADIO TOWER
- STATE CAPITAL COMPLEX (4)  
CITY/TOWN OFFICE (5)
- SCHOOL
- PUBLIC WORKS
- COURT HOUSE
- WATER TOWER
- Well
- PUMP STATION
- WATER TREATMENT FACILITY
- TRANSFORMER STATION
- DAM
- KENNEBEC COUNTY EMA (6)  
MAINE EMA (7)
- RIVERVIEW PSYCHIATRIC (8)  
MAINE GENERAL HOSPITAL (9)
- MGH HELI PAD
- POLICE STATION
- DELTA AMBULANCE
- FIRE STATIONS
- KENNEBEC COUNTY JAIL
- BRIDGE
- TRANSFER STATION
- POWER LINES
- RAILROAD TRACKS
- MOBILITY CORRIDOR

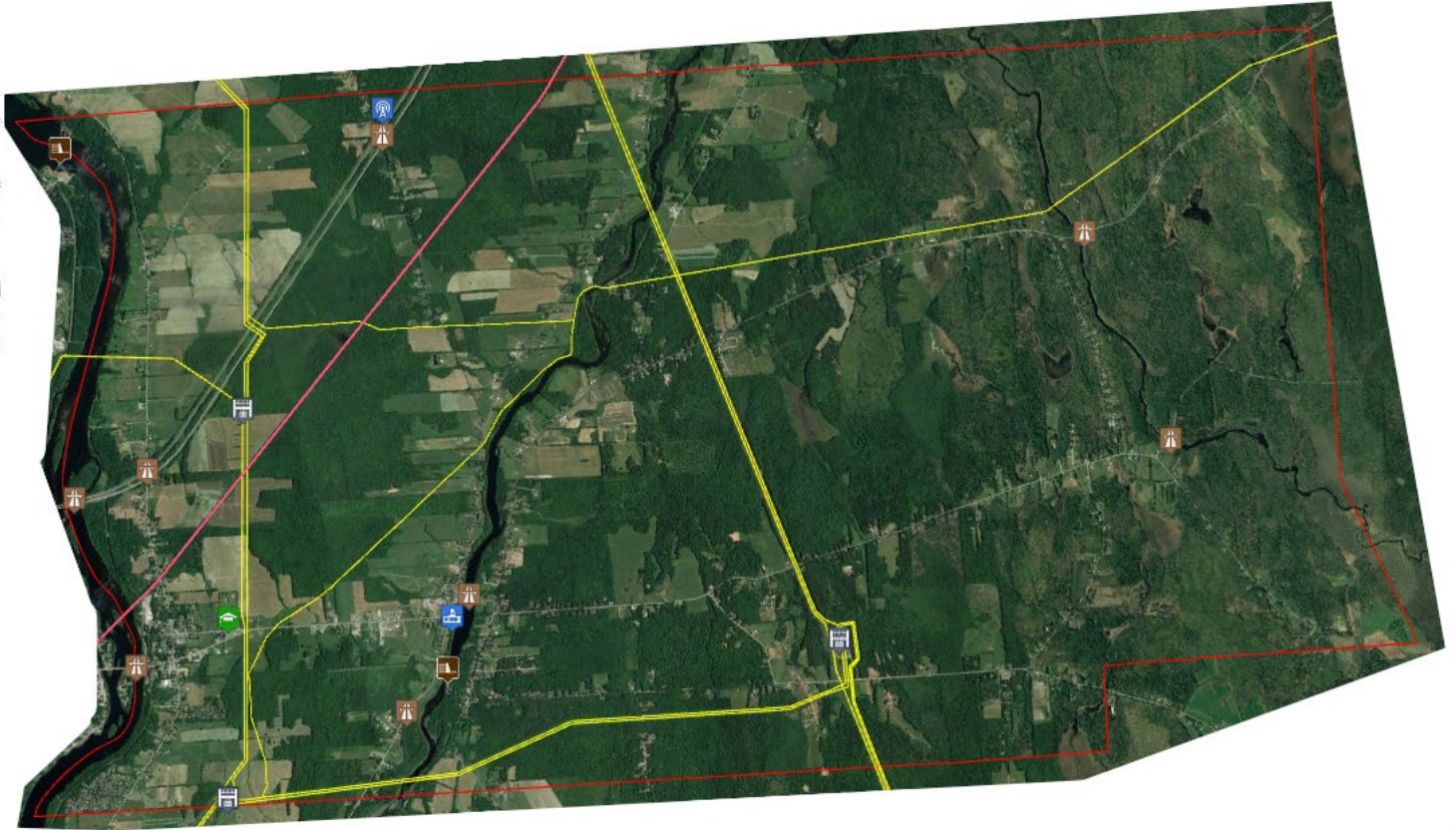











# BELGRADE



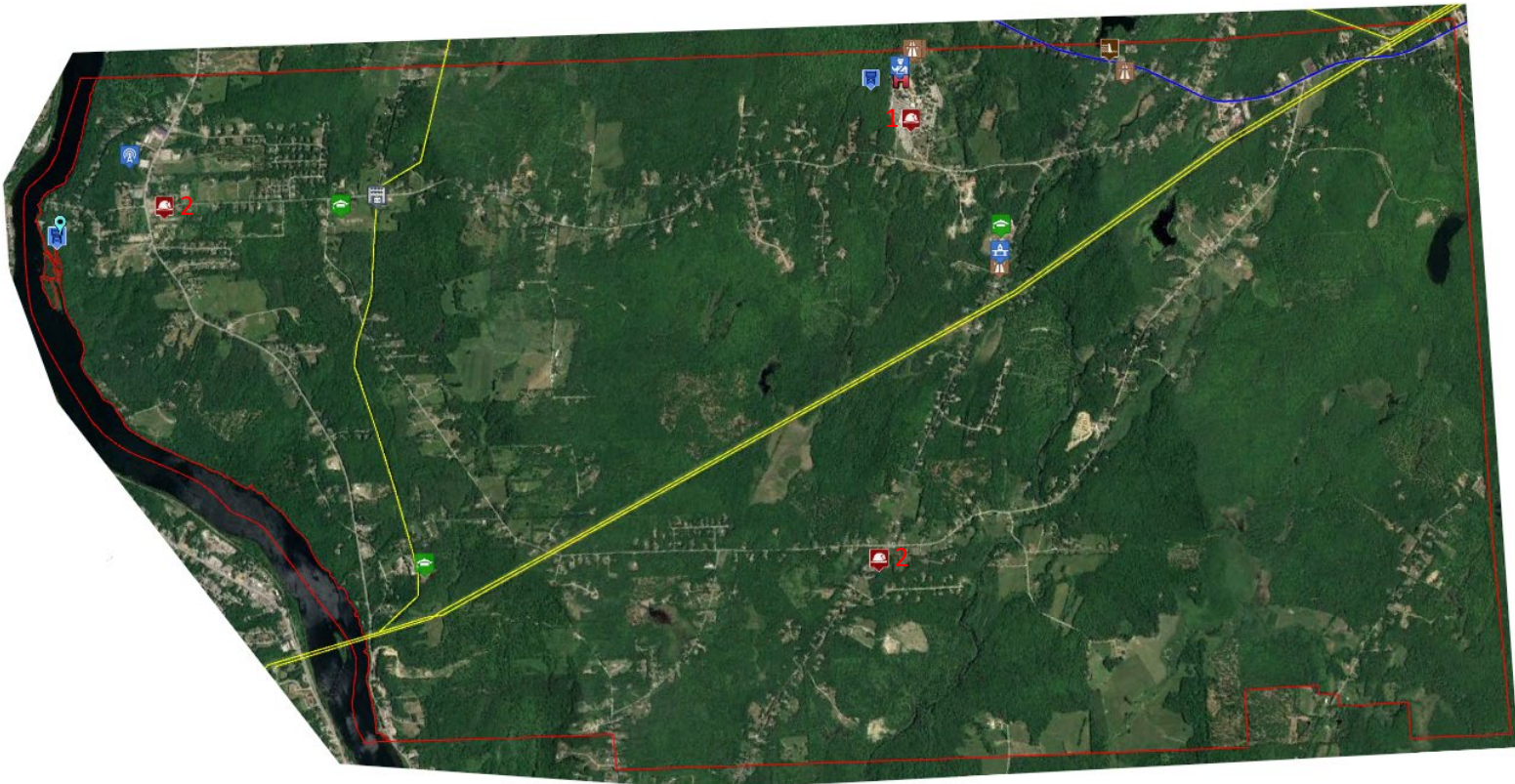
-  DAM
-  LIBRARIES
-  CITY/TOWN OFFICE
-  TRANSFER STATION
-  FIRE STATIONS
-  BRIDGE
-  SCHOOL
-  RAILROAD TRACKS
-  MOBILITY CORRIDOR

# BENTON



-  DAM
-  SCHOOL
-  BRIDGE
-  CITY/TOWN OFFICE
-  TRANSFORMER STATION
-  CELL/RADIO TOWER
-  POWER LINES
-  RAILROAD TRACKS
-  MOBILITY CORRIDOR

# CHELSEA





 TOGUS VA HOSPITAL


 DAM

 BRIDGE

 SCHOOL

 TOGUS FIRE DEPT. (1)  
 CHELSEA FIRE DEPT. (2)

 WELL

 WATER TOWER

 CELL/RADIO TOWER

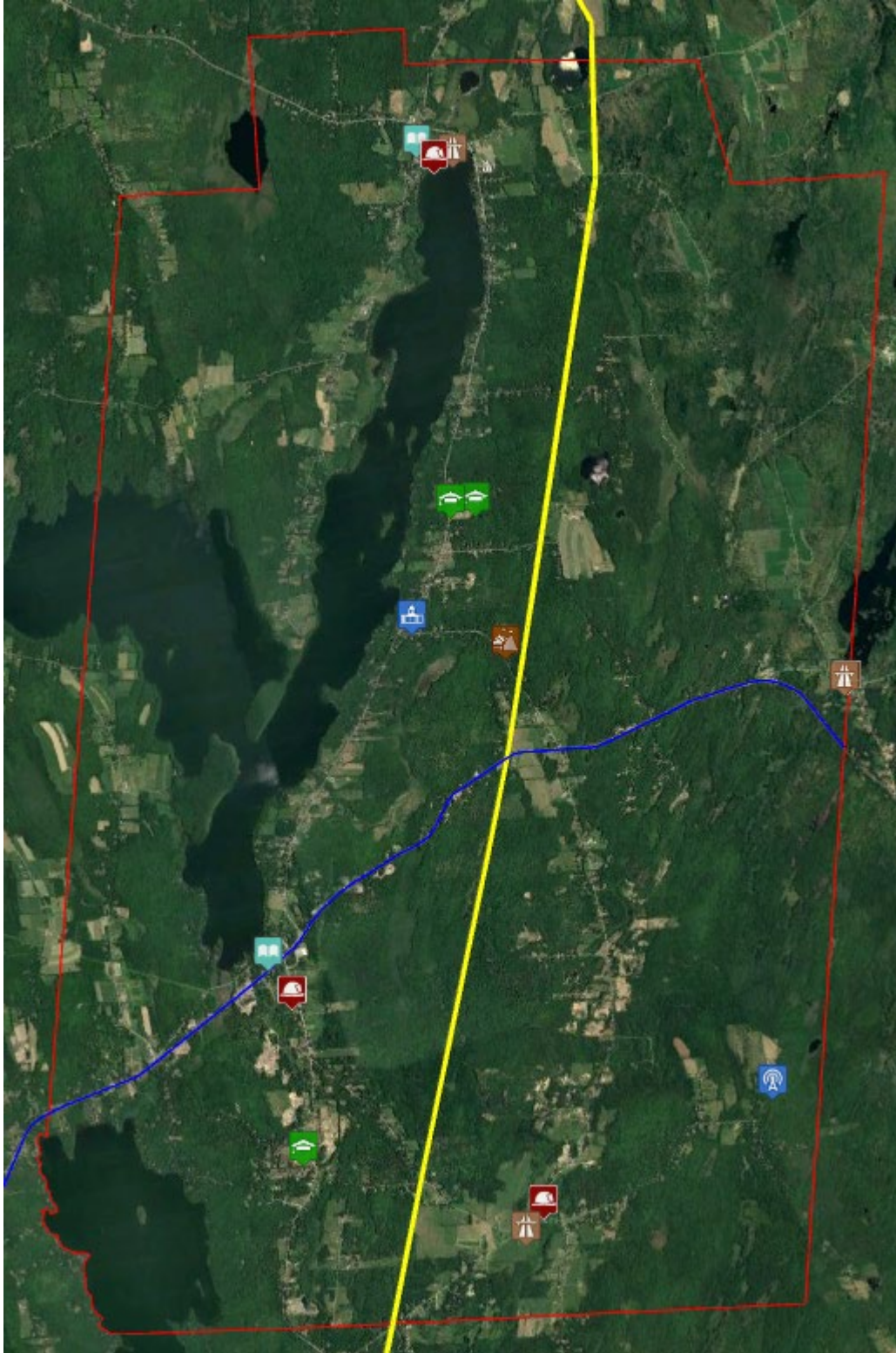
 TRANSFORMER STATION

 CITY/TOWN OFFICE

 MOBILITY CORRIDOR

 POWER LINES

# CHINA



 CELL/RADIO TOWER

 LIBRARIES


 TRANSFER STATION

 BRIDGE

 SCHOOL

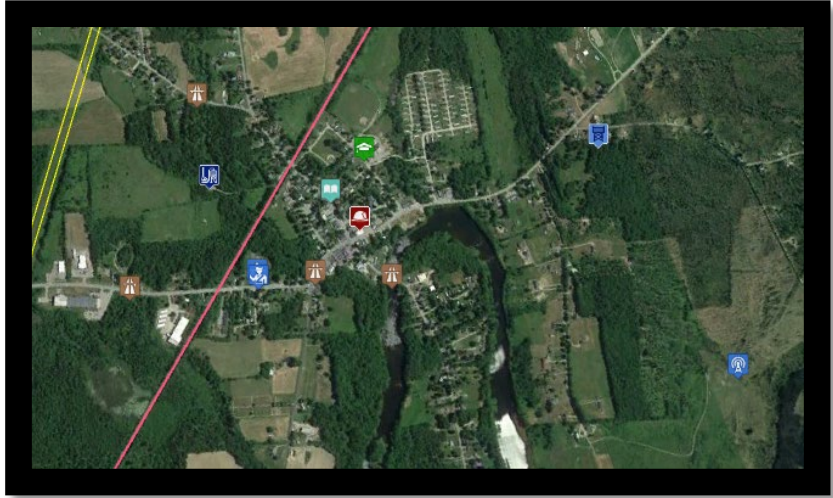
 CHINA FIRE DEPTS.















 CITY/TOWN OFFICE

 POWER LINES

 MOBILITY CORRIDOR

# CLINTON



- |  |  |
|--|--|
|  WATER TOWER              |  CLINTON POLICE DEPT. |
|  BRIDGE                   |  CLINTON FIRE DEPT.   |
|  WATER TREATMENT FACILITY |  SCHOOL               |
|  PUMP STATION             |  LIBRARIES            |
|  TRANSFER STATION         |  CELL/RADIO TOWER     |
|  CITY/TOWN OFFICE         |  DAM                  |
|  |  POWER LINES          |
|  |  RAILROAD TRACKS      |

# FARMINGDALE




 BRIDGE

 TRANSFORMER STATION

 CITY/TOWN OFFICE

 SCHOOL

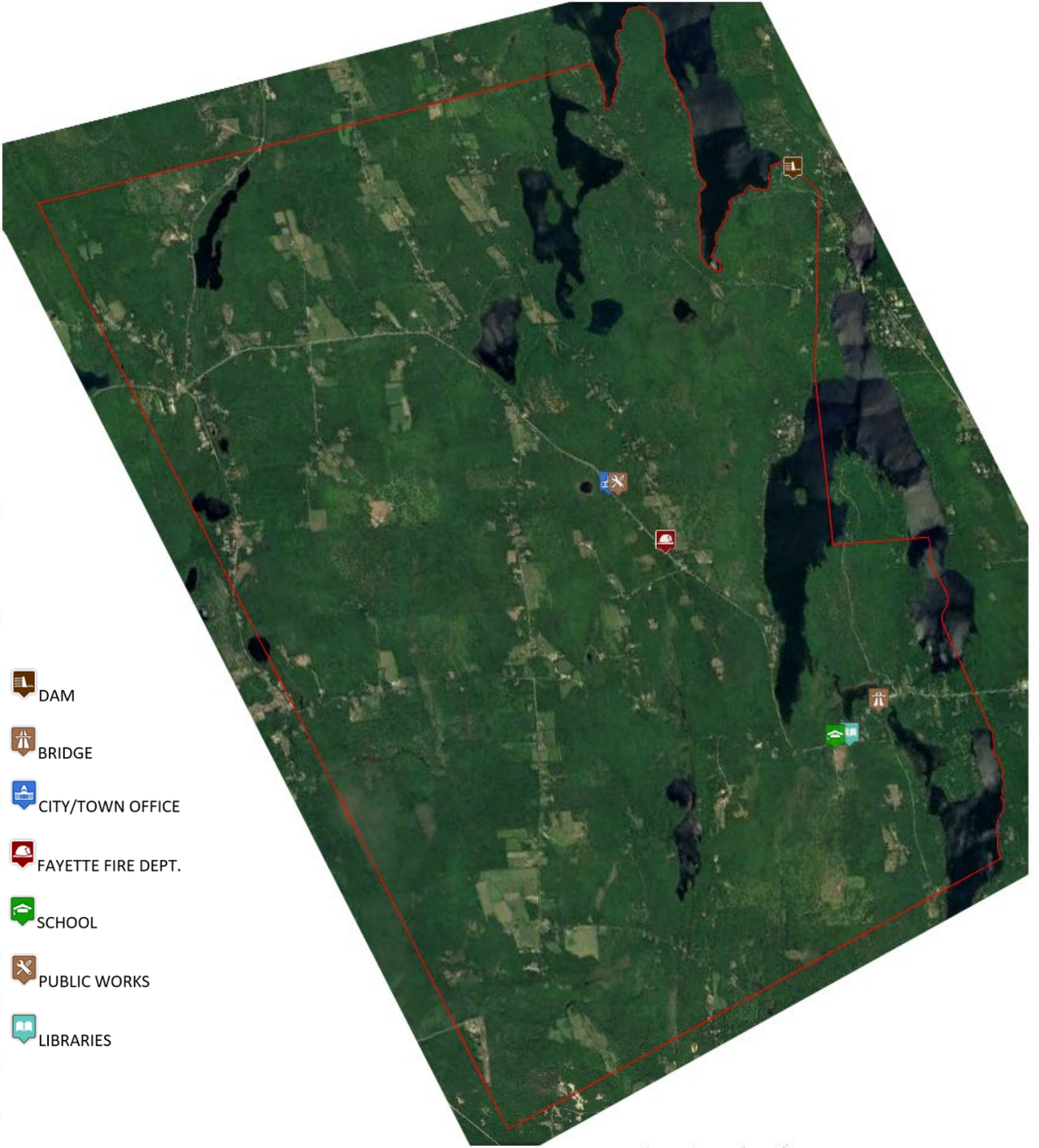
 FARMINGDALE FIRE DEPT.

 WATER TOWER

 POWER LINES



# FAYETTE



DAM



BRIDGE



CITY/TOWN OFFICE



FAYETTE FIRE DEPT.



SCHOOL



PUBLIC WORKS



LIBRARIES

# GARDINER


 TRANSFORMER STATION

 GARDINER FIRE DEPT.

 GARDINER POLICE DEPT.

 RAILROAD TRACKS

 CELL/RADIO TOWER

 AMORY

 POWER LINES

 PUMP STATION

 LIBRARIES

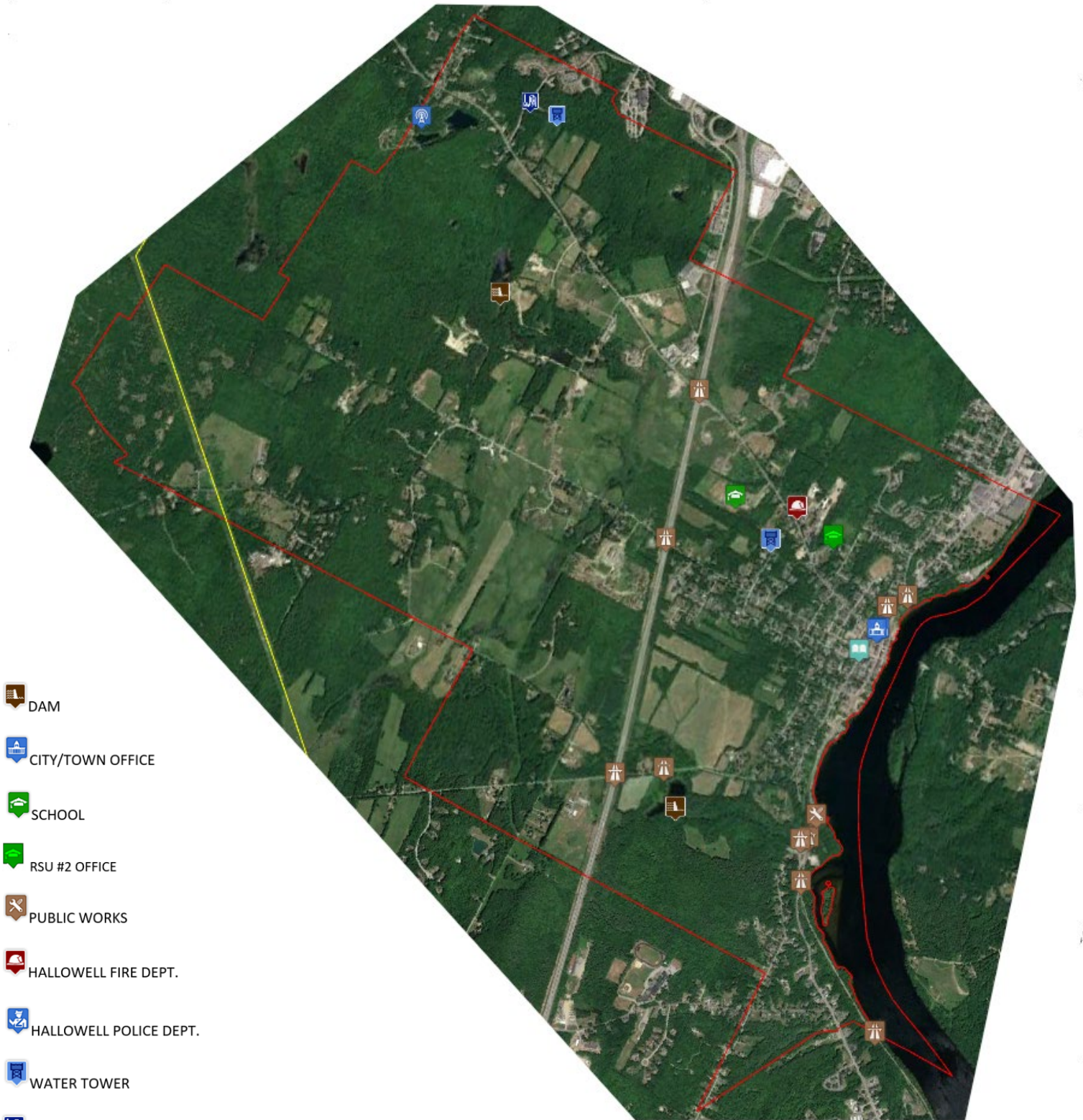
 SCHOOL












 BRIDGE

 DAM

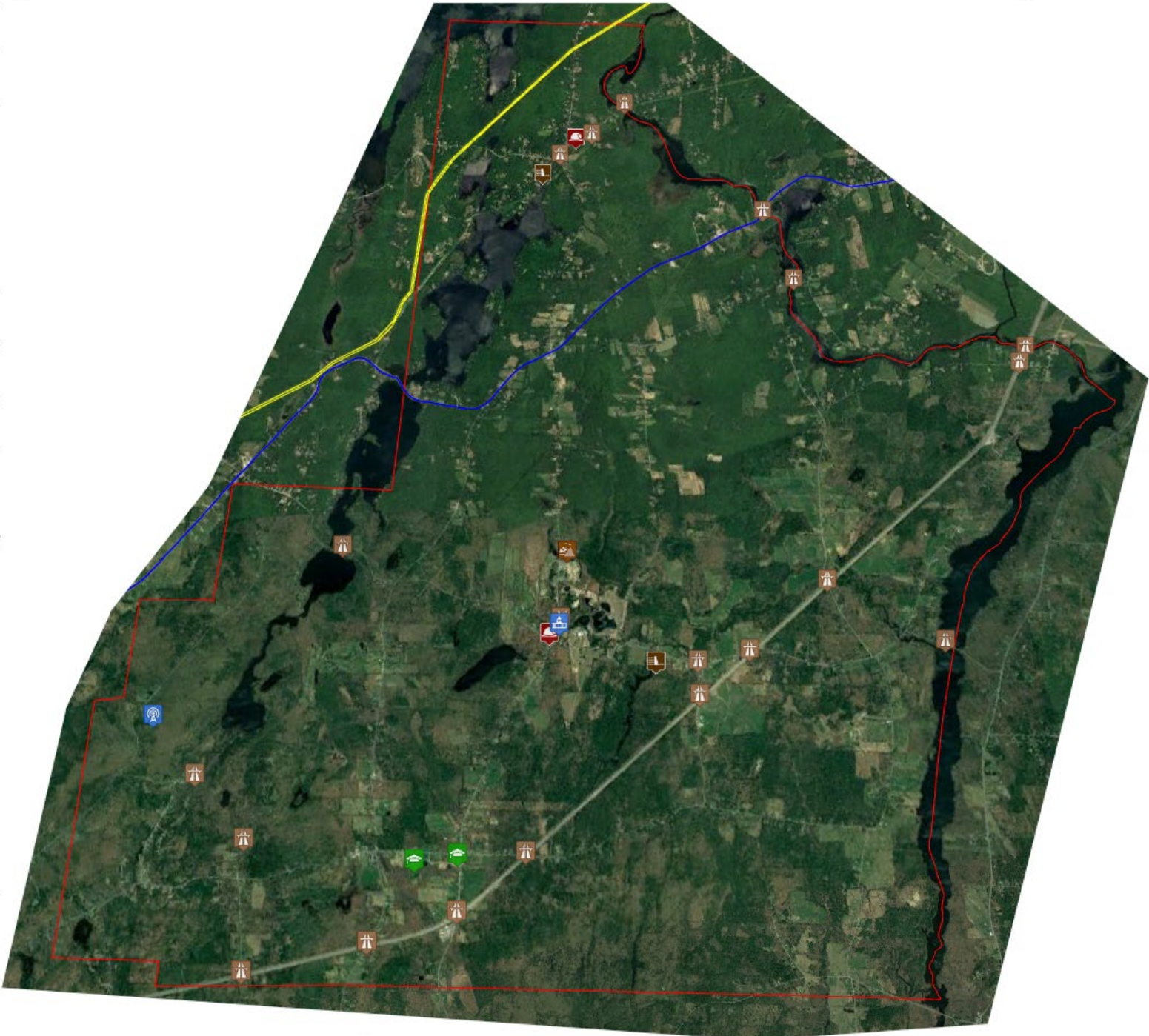


# CITY OF HALLOWELL



-  DAM
-  CITY/TOWN OFFICE
-  SCHOOL
-  RSU #2 OFFICE
-  PUBLIC WORKS
-  HALLOWELL FIRE DEPT.
-  HALLOWELL POLICE DEPT.
-  WATER TOWER
-  PUMP STATION
-  LIBRARIES
-  POWER LINES

# LITCHFIELD



BRIDGE



TRANSFER STATION



DAM



LITCHFIELD FIRE DEPT.



CITY/TOWN OFFICE



PUBLIC WORKS



CELL/RADIO TOWER

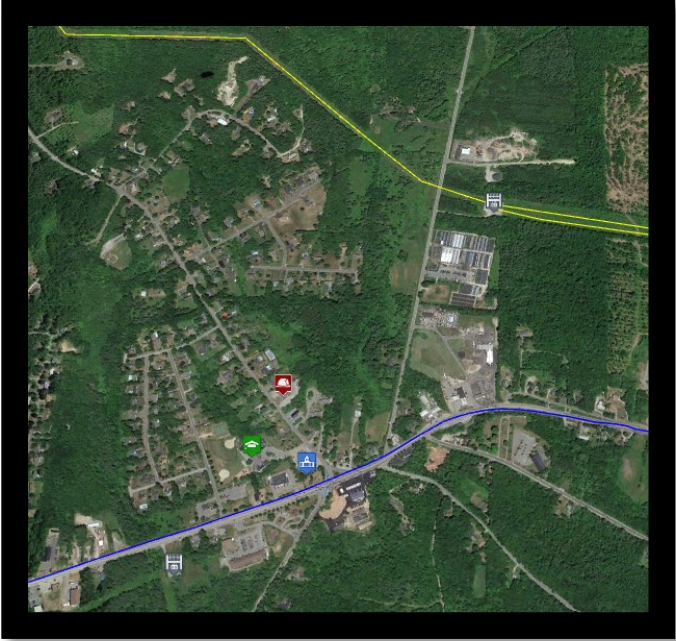
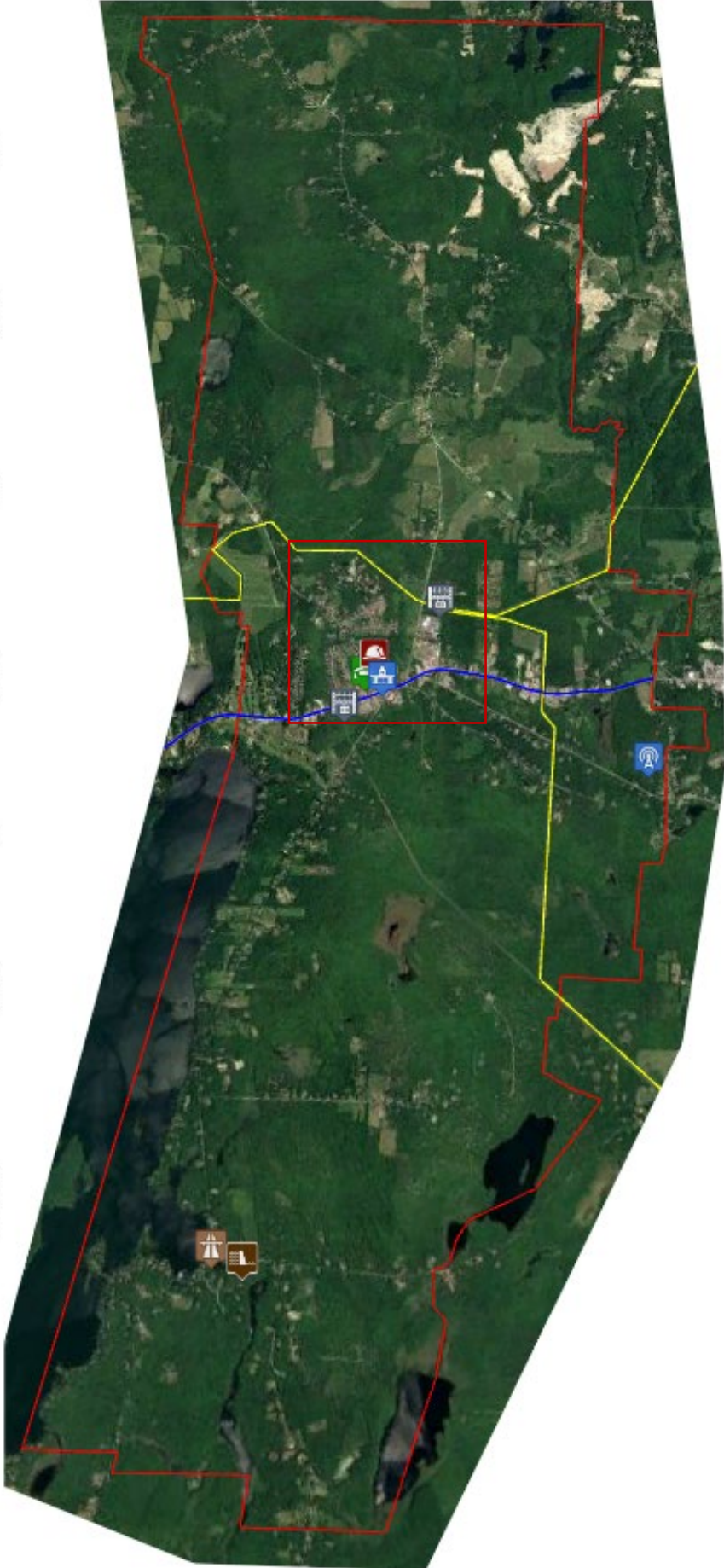
POWER LINES



SCHOOL

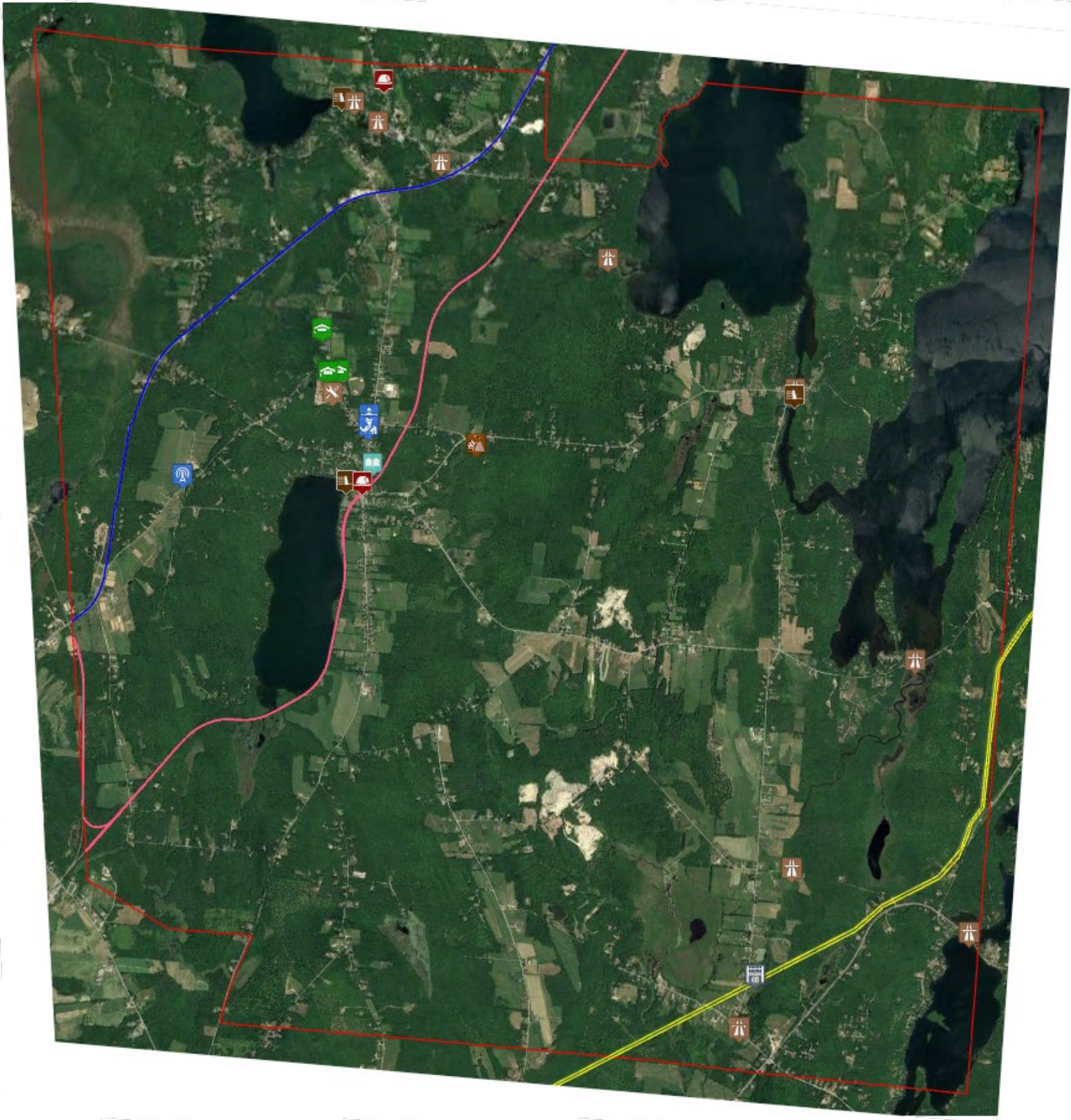
MOBILITY CORRIDOR

# MANCHESTER



-  BRIDGE
-  DAM
-  CITY/TOWN OFFICE
-  CELL/RADIO TOWER
-  MANCHESTER FIRE DEPT.
-  SCHOOL
-  TRANSFORMER STATION
-  POWER LINES
-  MOBILITY CORRIDOR

# MONMOUTH



 BRIDGE

 PUBLIC WORKS

 MONMOUTH FIRE DEPT.

 POWER LINES

 DAM

 LIBRARIES

 MONMOUTH POLICE DEPT.

 RAILROAD TRACKS

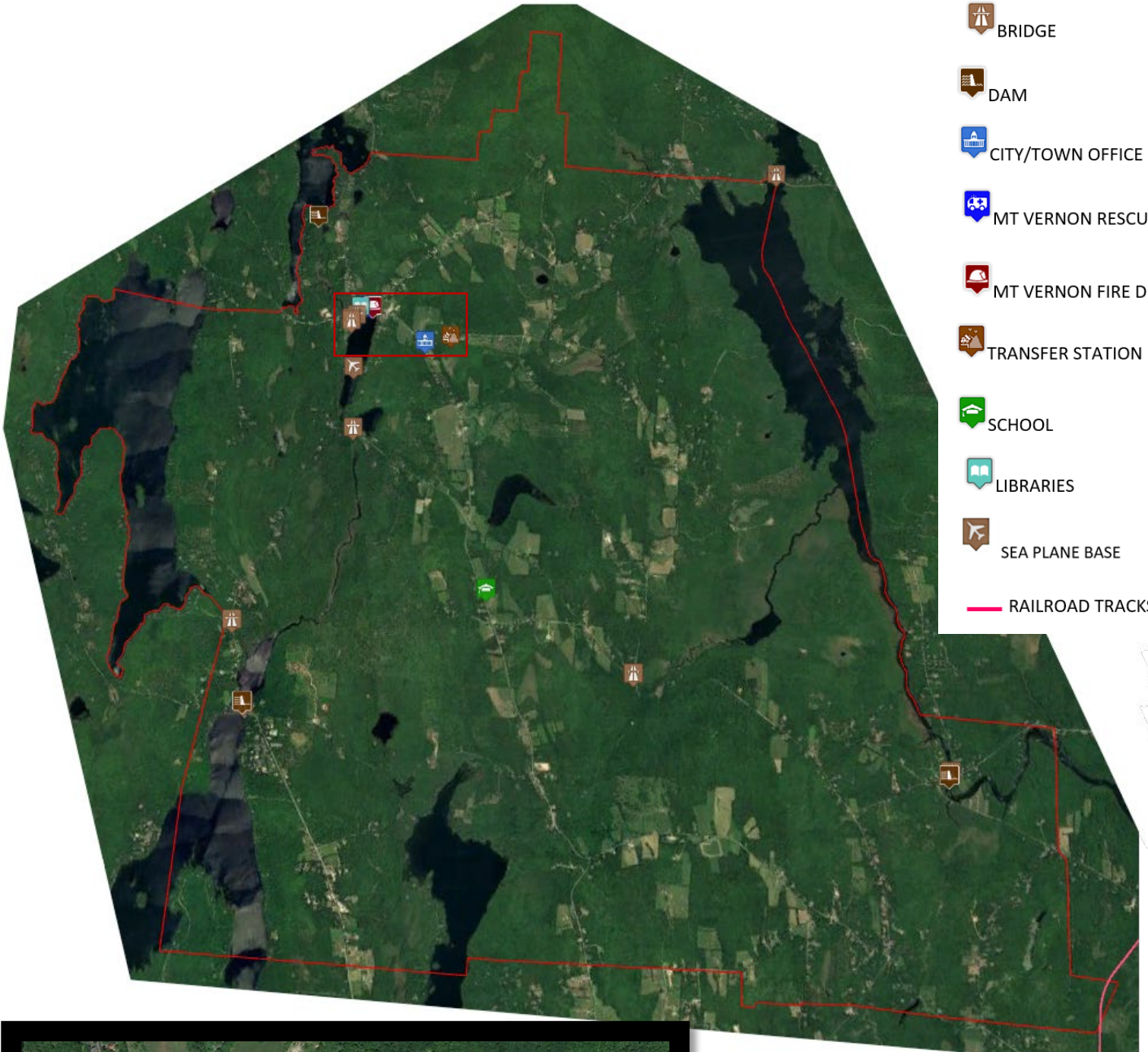
 CITY/TOWN OFFICE

 TRANSFER STATION

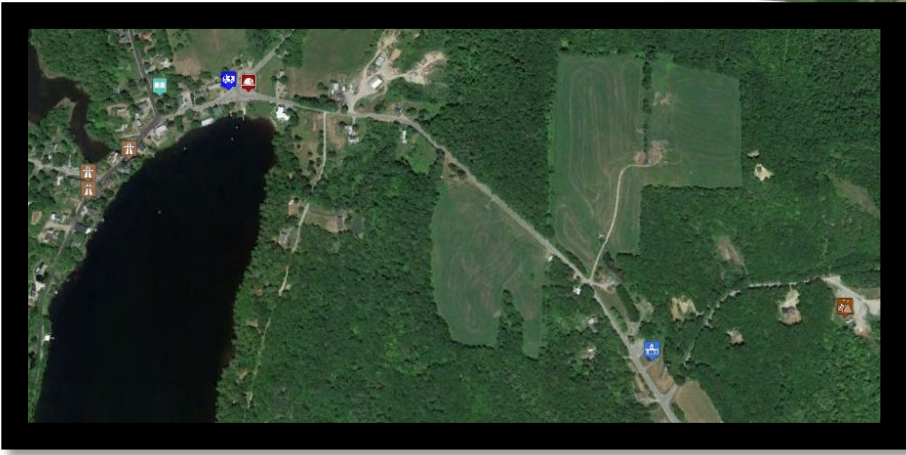
 CELL/RADIO TOWER

 MOBILITY CORRIDOR

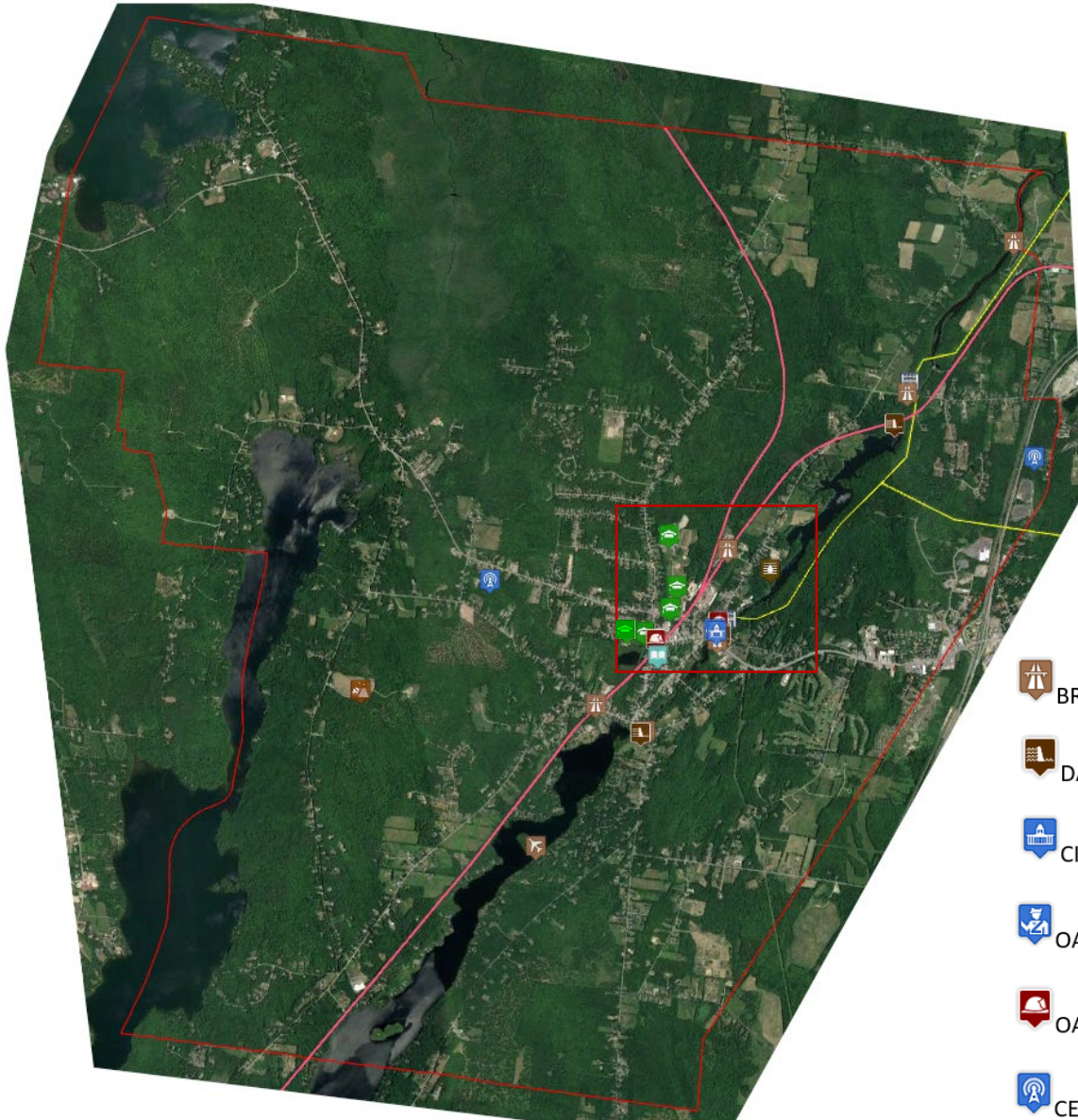
# MOUNT VERNON











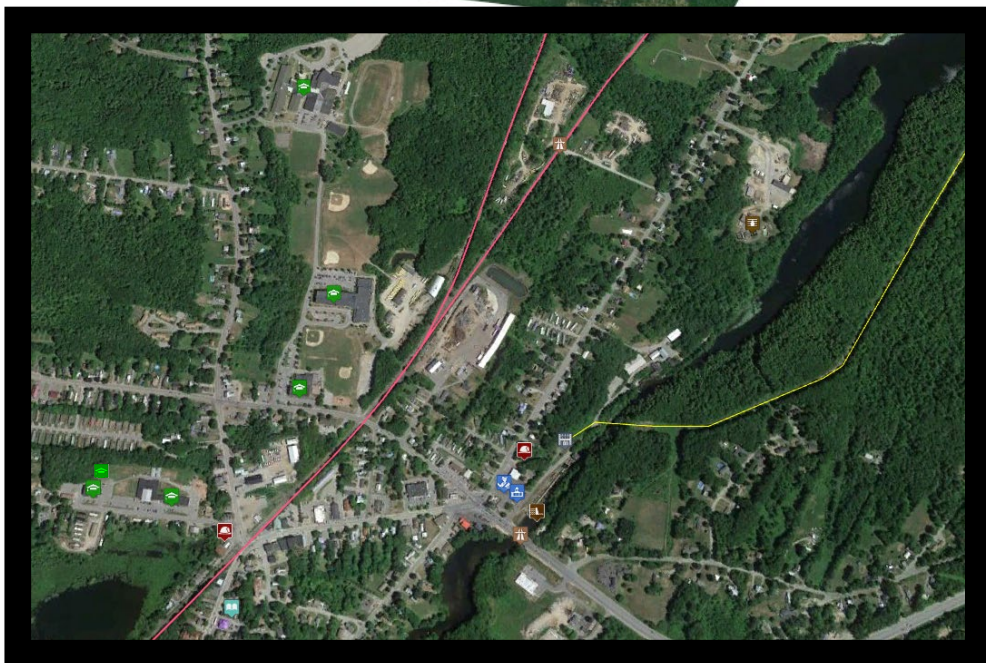
-  BRIDGE
-  DAM
-  CITY/TOWN OFFICE
-  MT VERNON RESCUE
-  MT VERNON FIRE DEPT.
-  TRANSFER STATION
-  SCHOOL
-  LIBRARIES
-  SEA PLANE BASE
-  RAILROAD TRACKS



# OAKLAND



-  BRIDGE
-  DAM
-  CITY/TOWN OFFICE
-  OAKLAND POLICE DEPT.
-  OAKLAND FIRE DEPT.
-  CELL/RADIO TOWER
-  SCHOOL
-  RSU #18 OFFICE
-  TRANSFORMER STATION
-  SEA PLANE BASE
-  TRANSFER STATION
-  POWER LINES
-  RAILROAD TRACKS





# PITTSTON



 BRIDGE

 CELL/RADIO TOWER

 PITTSTON FIRE DEPT.

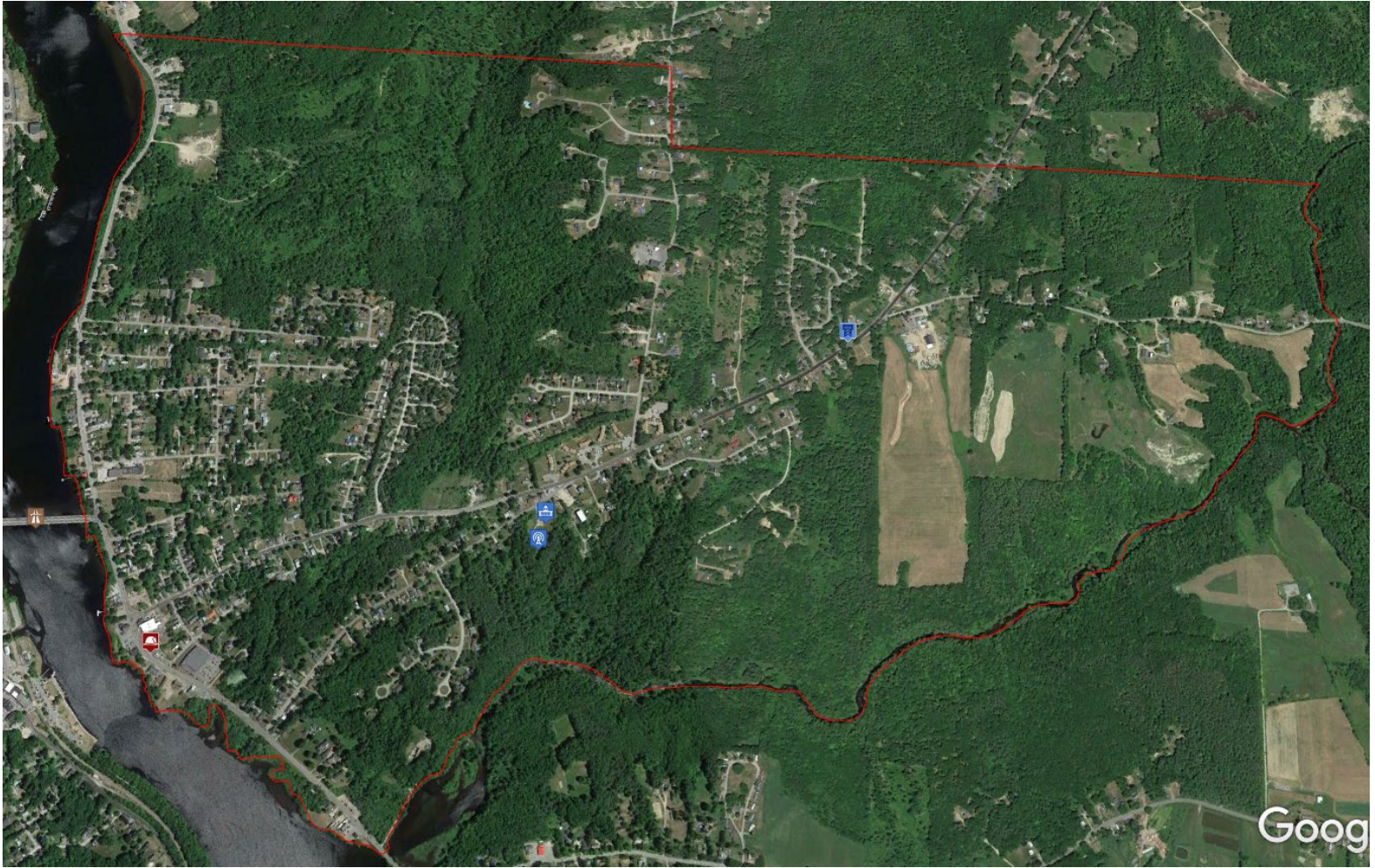
 CITY/TOWN OFFICE

 SCHOOL

 PUMP STATION

 MOBILITY CORRIDOR


# RANDOLPH




 BRIDGE

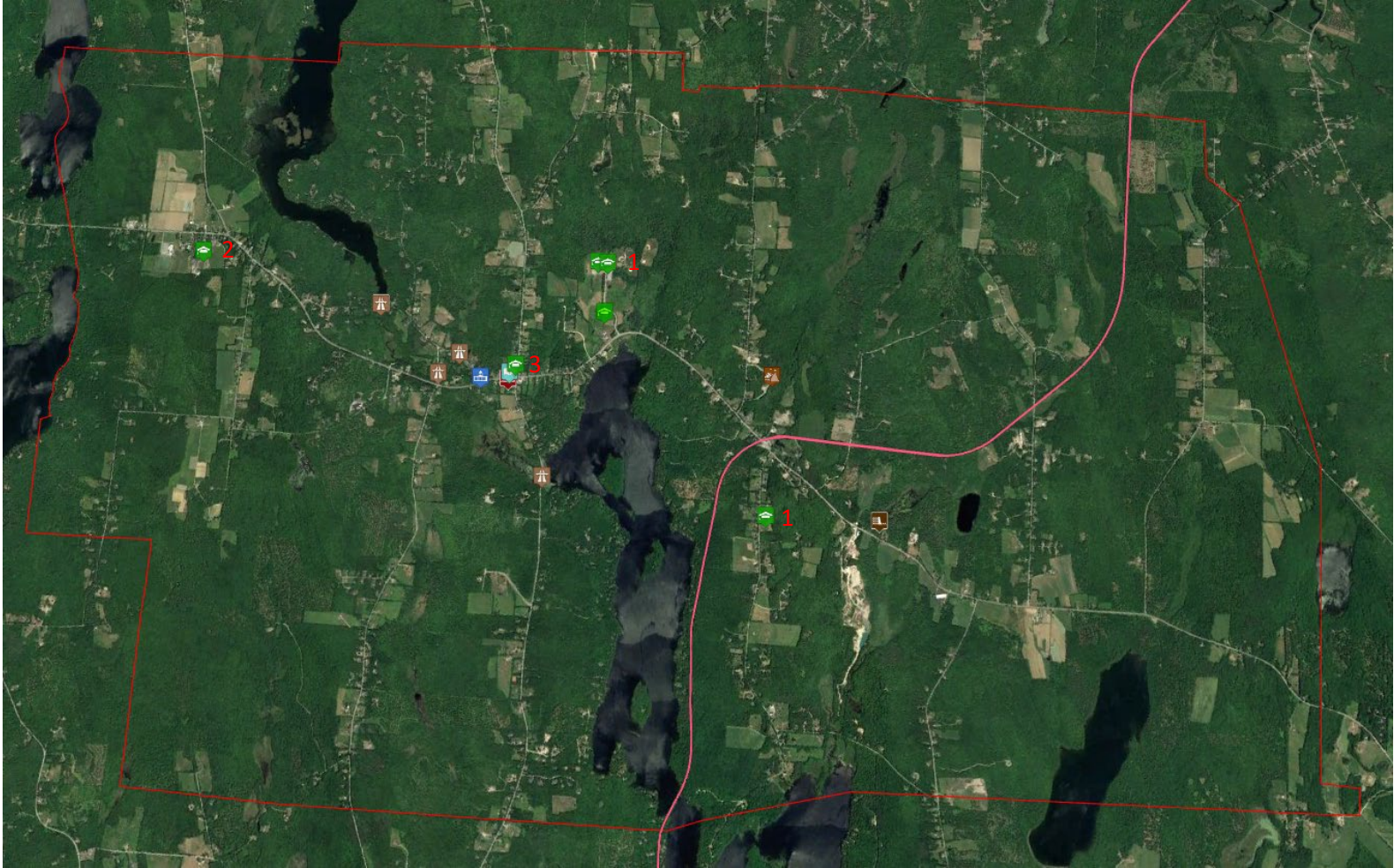
 CELL/RADIO TOWER

 CITY/TOWN OFFICE

 RANDOLPH FIRE DEPT.

 WATER TOWER

# READFIELD




 BRIDGE

 DAM

 CITY/TOWN OFFICE

 TRANSFER STATION

 SCHOOLS    RSU 38 SCHOOLS (1)  
                             KENTS HILL SCHOOL (2)  
                             MAPLE TREE SCHOOL (3)

 RSU #38 OFFICE

 READFIELD FIRE DEPT.

 LIBRARIES

# ROME



 BRIDGE

 CELL/RADIO TOWER

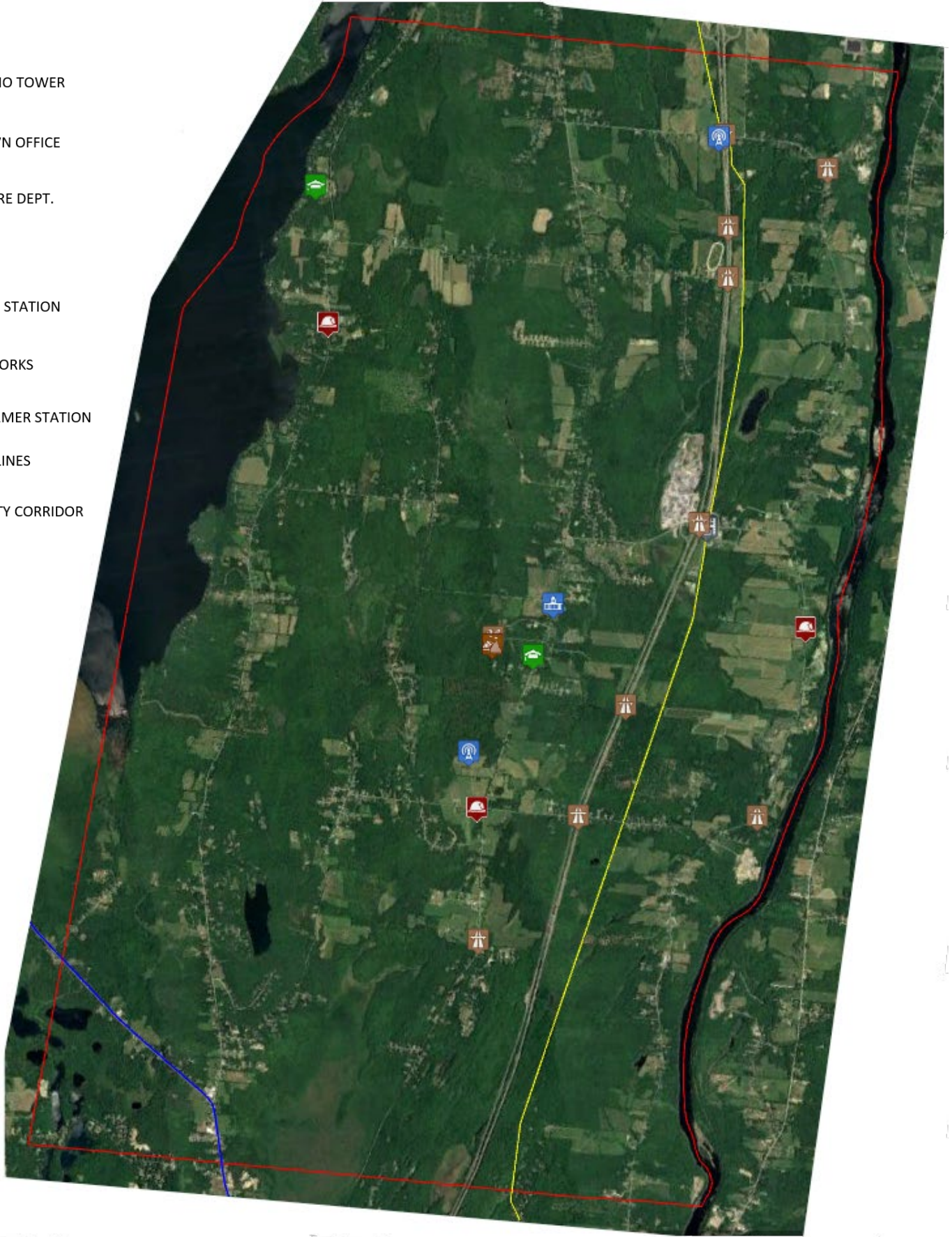
 CITY/TOWN OFFICE

 ROME FIRE DEPT.

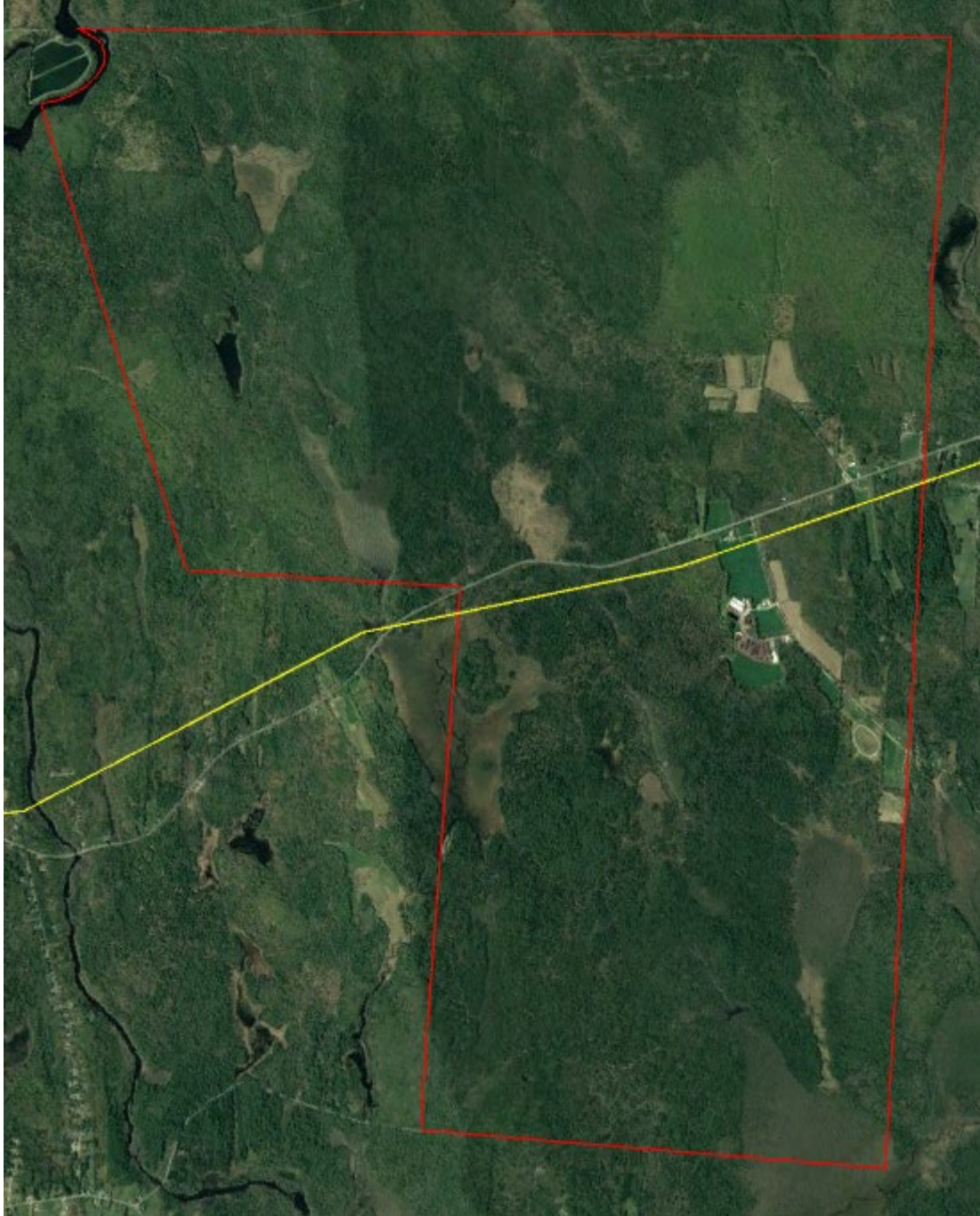
 MOBILITY CORRIDOR

# SIDNEY

-  BRIDGE
-  CELL/RADIO TOWER
-  CITY/TOWN OFFICE
-  SIDNEY FIRE DEPT.
-  SCHOOLS
-  TRANSFER STATION
-  PUBLIC WORKS
-  TRANSFORMER STATION
-  POWER LINES
-  MOBILITY CORRIDOR

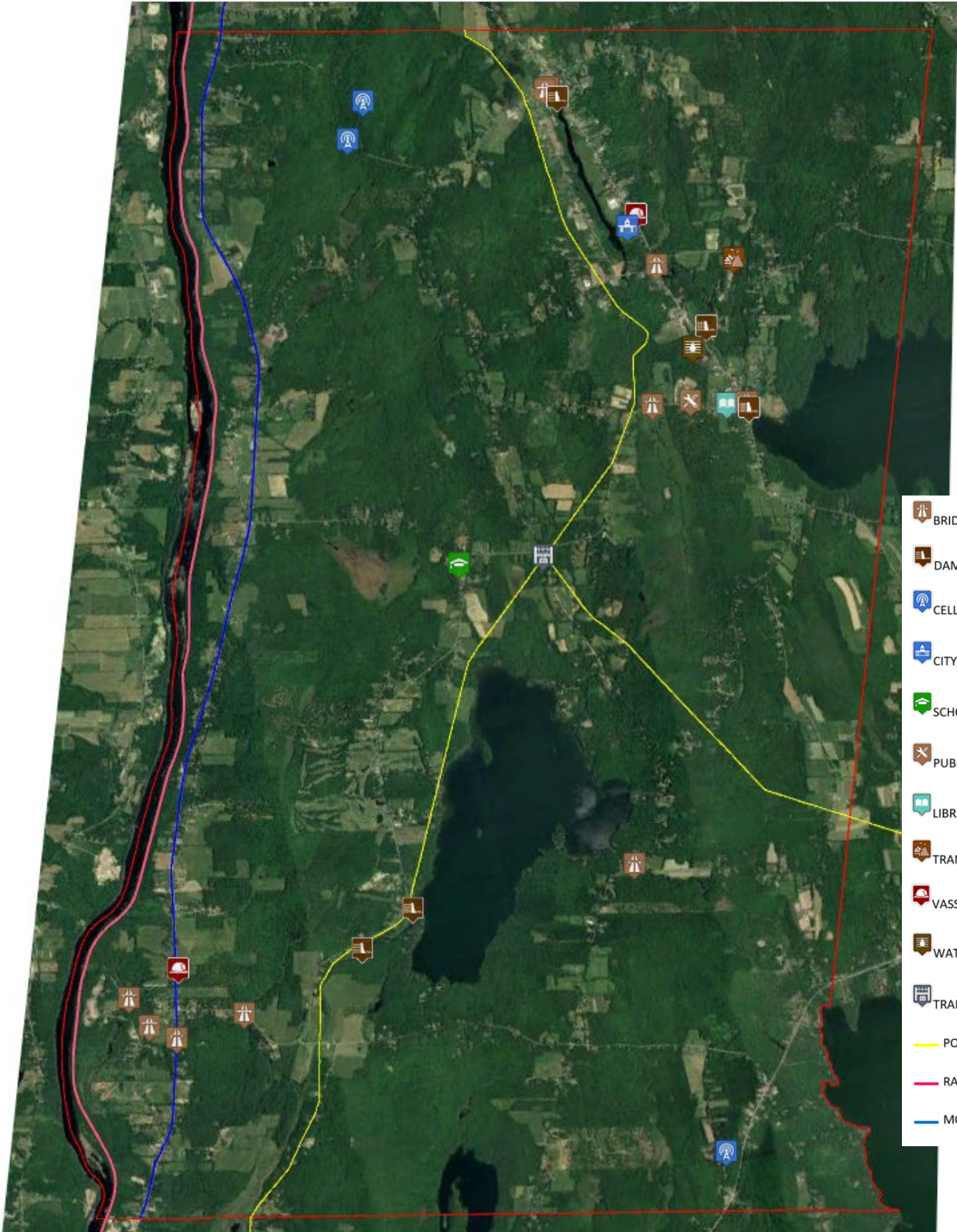


# UNITY TOWNSHIP

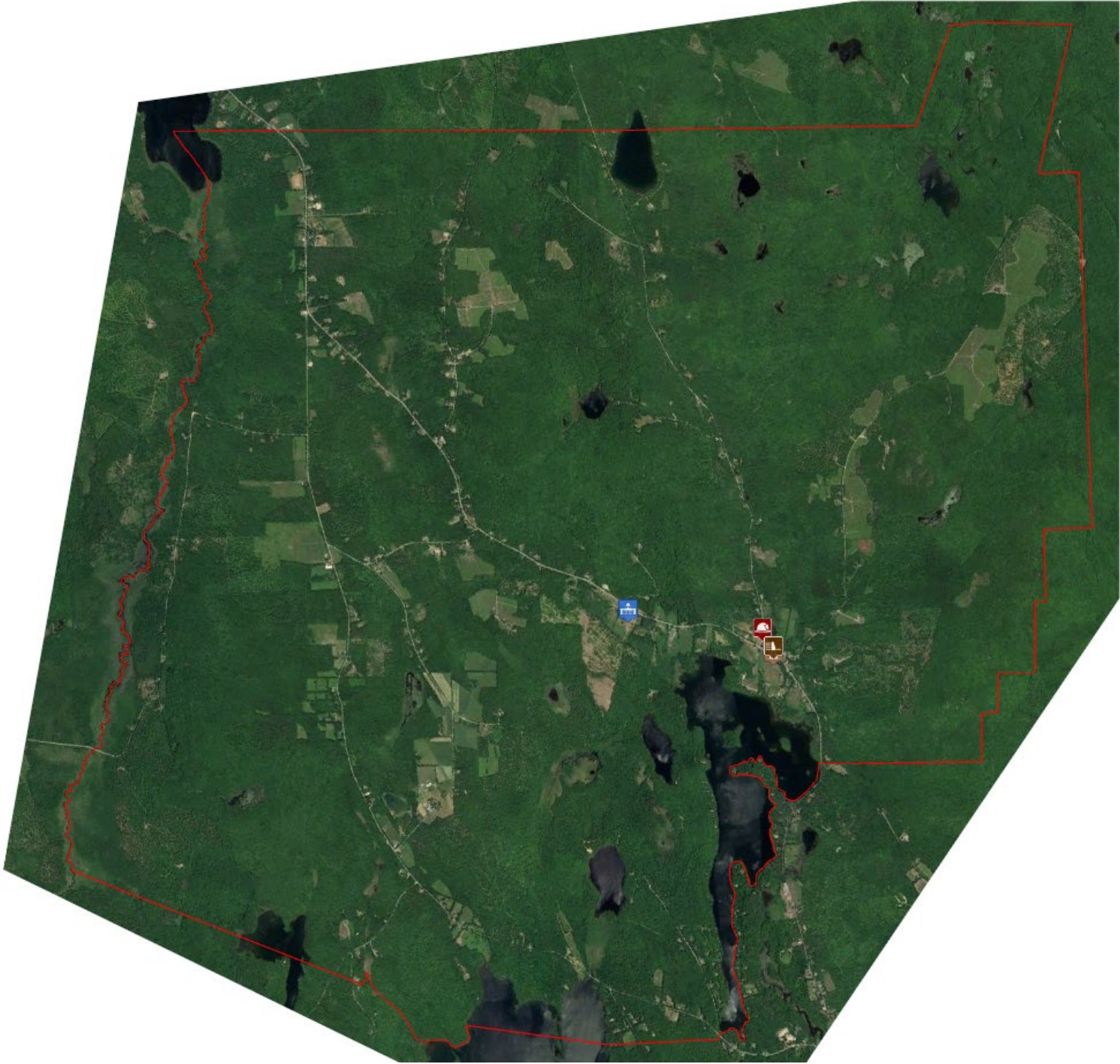


— POWER LINES

# VASSALBORO



# VIENNA



 BRIDGE









 DAM

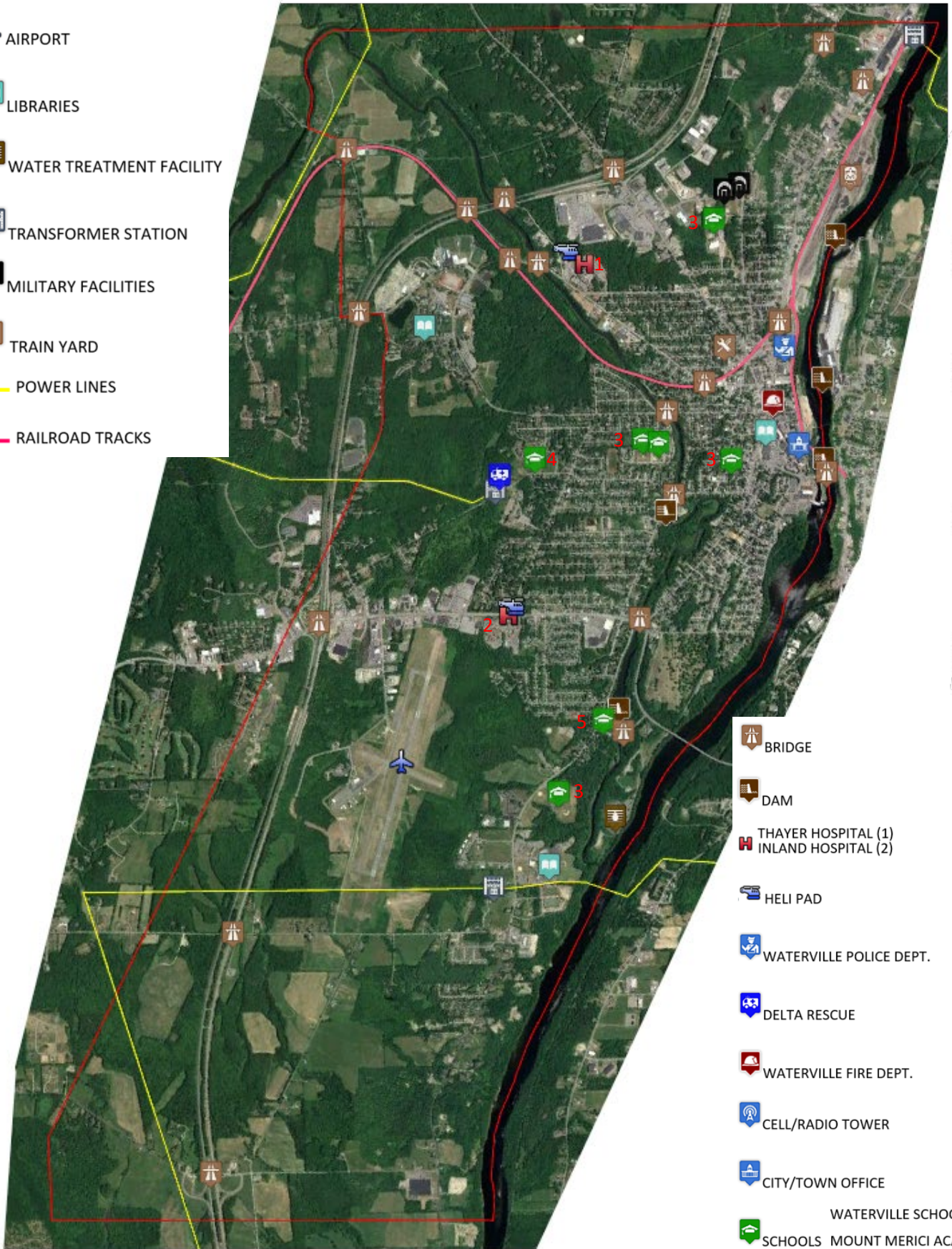
 CITY/TOWN OFFICE














 VIENNA FIRE DEPT.



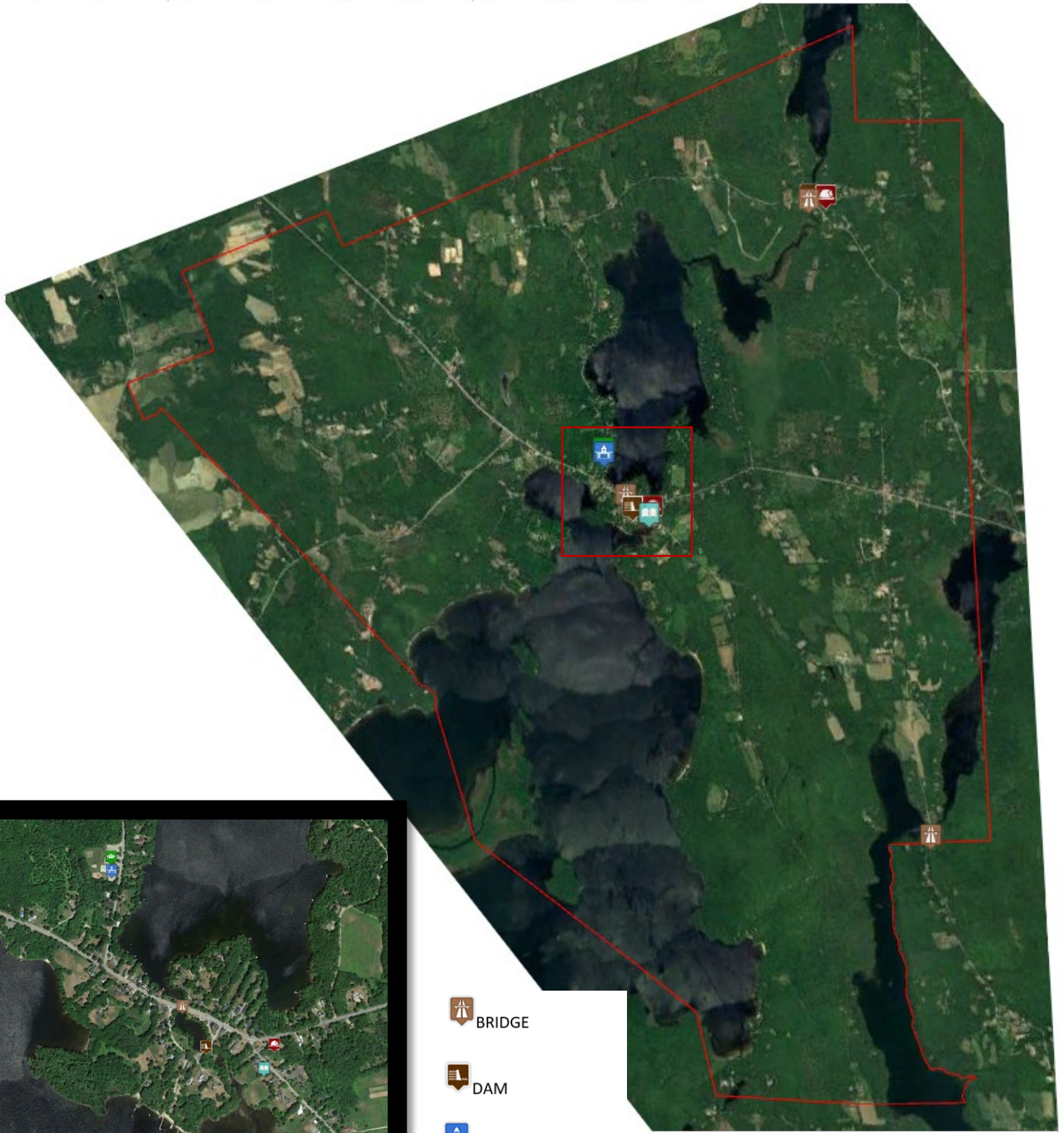
# CITY OF WATERVILLE

-  AIRPORT
-  LIBRARIES
-  WATER TREATMENT FACILITY
-  TRANSFORMER STATION
-  MILITARY FACILITIES
-  TRAIN YARD
-  POWER LINES
-  RAILROAD TRACKS



-  BRIDGE
-  DAM
-  THAYER HOSPITAL (1)  
INLAND HOSPITAL (2)
-  HELI PAD
-  WATERVILLE POLICE DEPT.
-  DELTA RESCUE
-  WATERVILLE FIRE DEPT.
-  CELL/RADIO TOWER
-  CITY/TOWN OFFICE
-  WATERVILLE SCHOOLS (3)
-  SCHOOLS MOUNT MERICI ACADEMY (4)
-  TEMPLE ACADEMY (5)
-  PUBLIC WORKS

# WAYNE



BRIDGE



DAM



CITY/TOWN OFFICE



SCHOOL

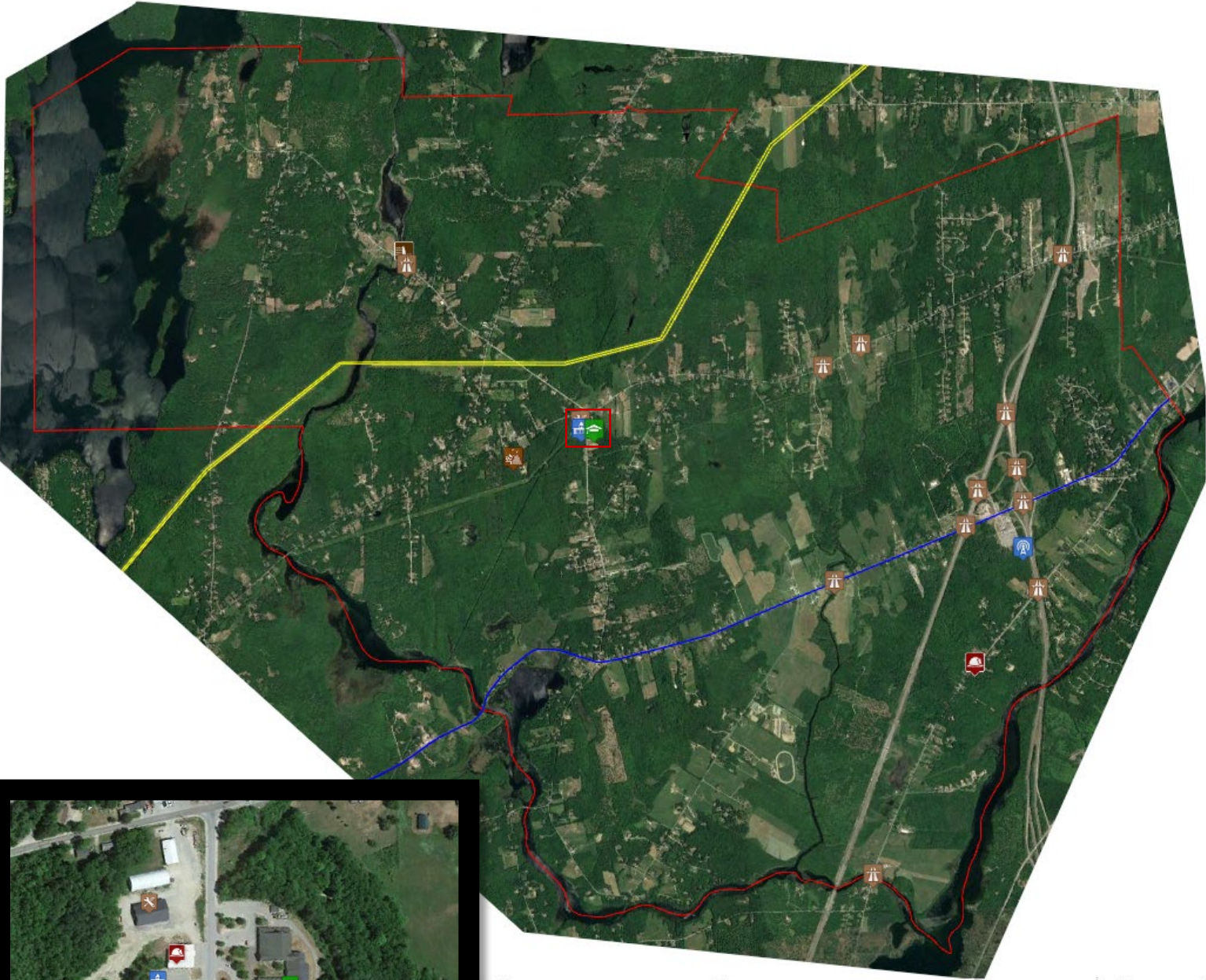












WAYNE FIRE DEPT.



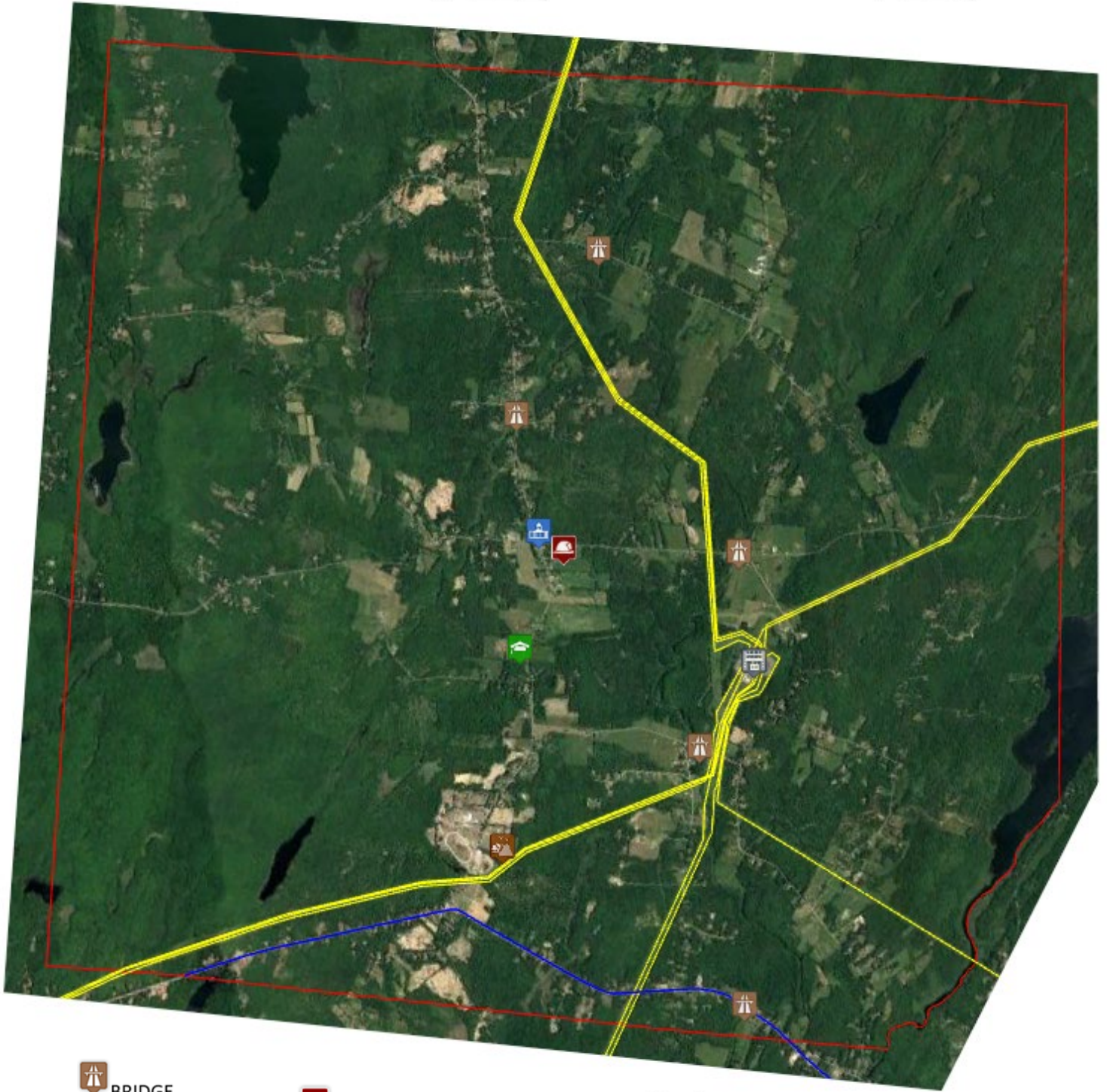
LIBRARIES

# WEST GARDINER



-  BRIDGE
-  DAM
-  CELL/RADIO TOWER
-  CITY/TOWN OFFICE
-  SCHOOL
-  PUBLIC WORKS
-  TRANSFER STATION
-  WEST GARDINER FIRE DEPT.
-  POWER LINES
-  MOBILITY CORRIDOR

# WINDSOR



 BRIDGE

 WINDSOR FIRE DEPT.

 CITY/TOWN OFFICE

 TRANSFORMER STATION

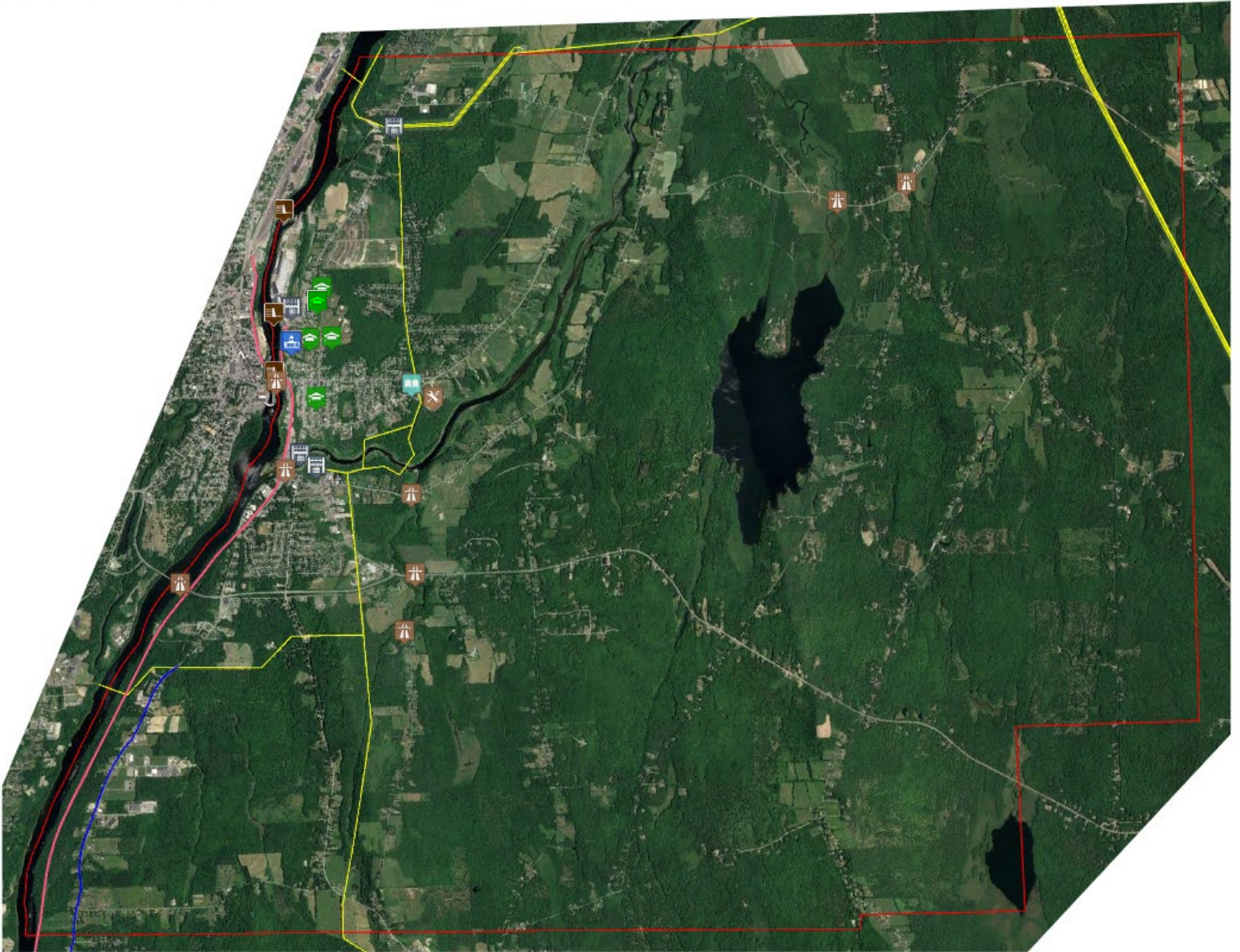
 SCHOOL

 POWER LINES

 TRANSFER STATION

 MOBILITY CORRIDOR

# WINSLOW




 BRIDGE

 DAM

 WINSLOW POLICE DEPT.

 WINSLOW FIRE DEPT. → SAME BUILDING

 CITY/TOWN OFFICE

 WINSLOW SCHOOLS (1)

ST JOHNS CATHOLIC SCHOOL(2)

 WINSLOW SCHOOL OFFICE

 LIBRARIES

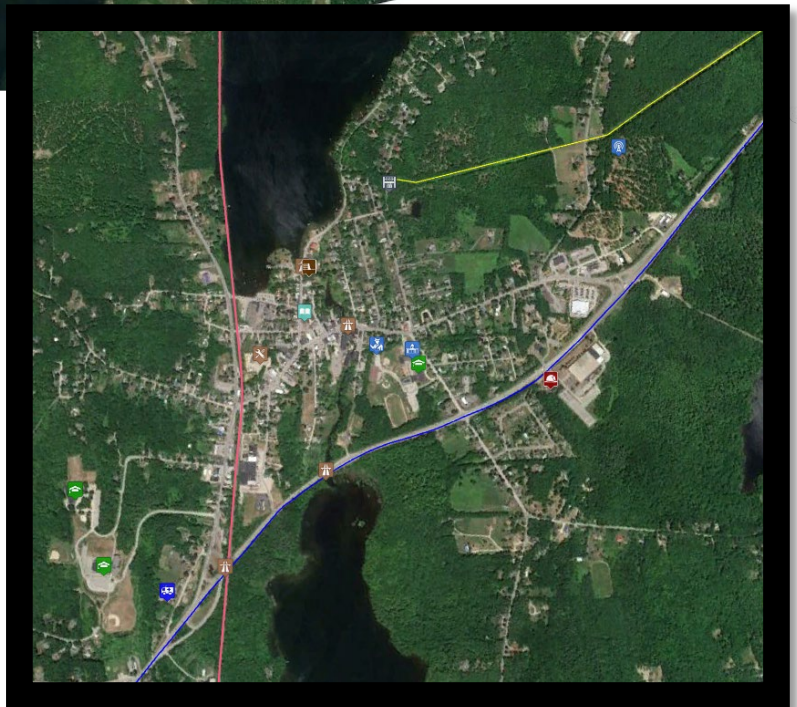
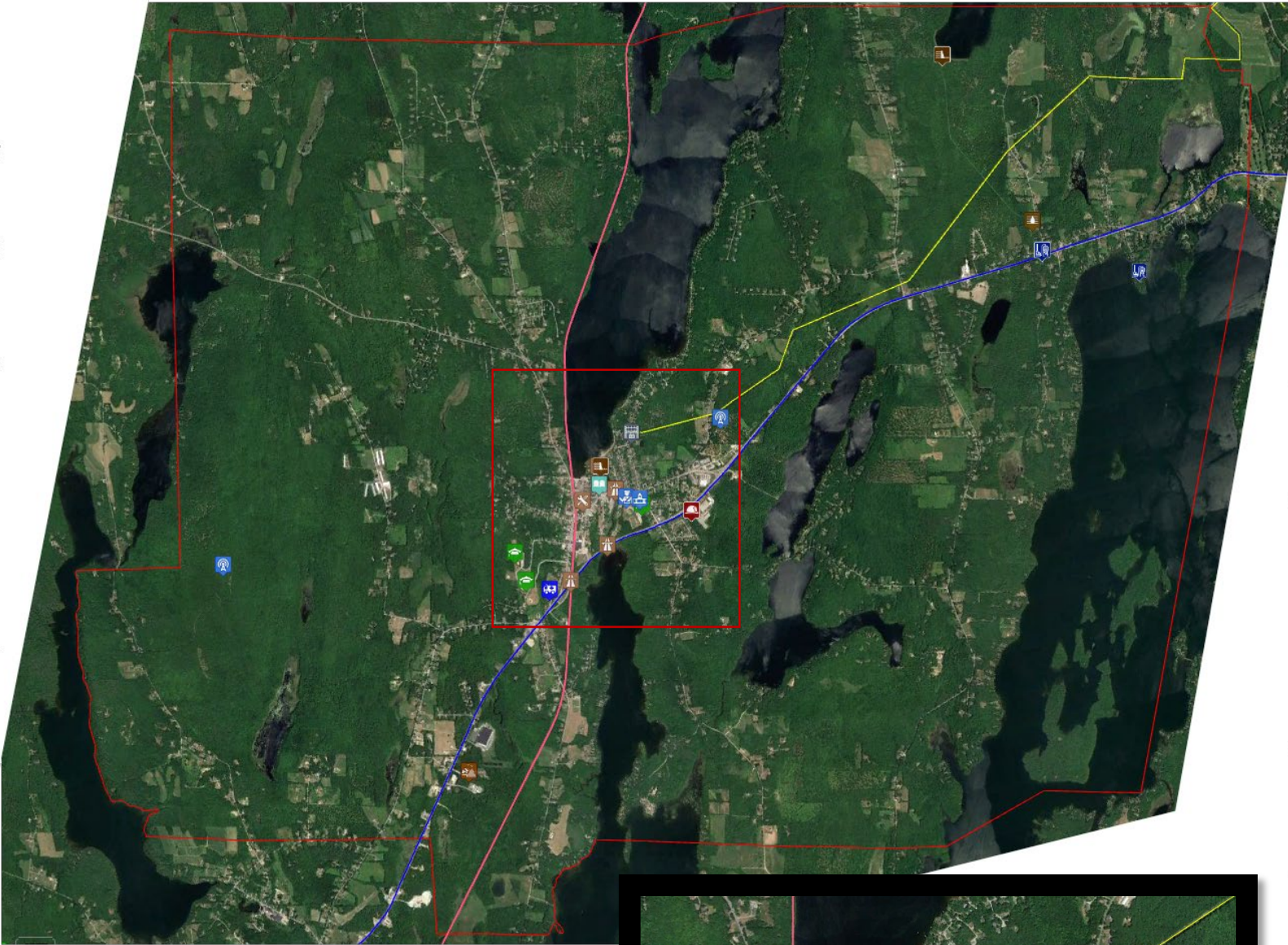
 PUBLIC WORKS

 TRANSFORMER STATION

 POWER LINES

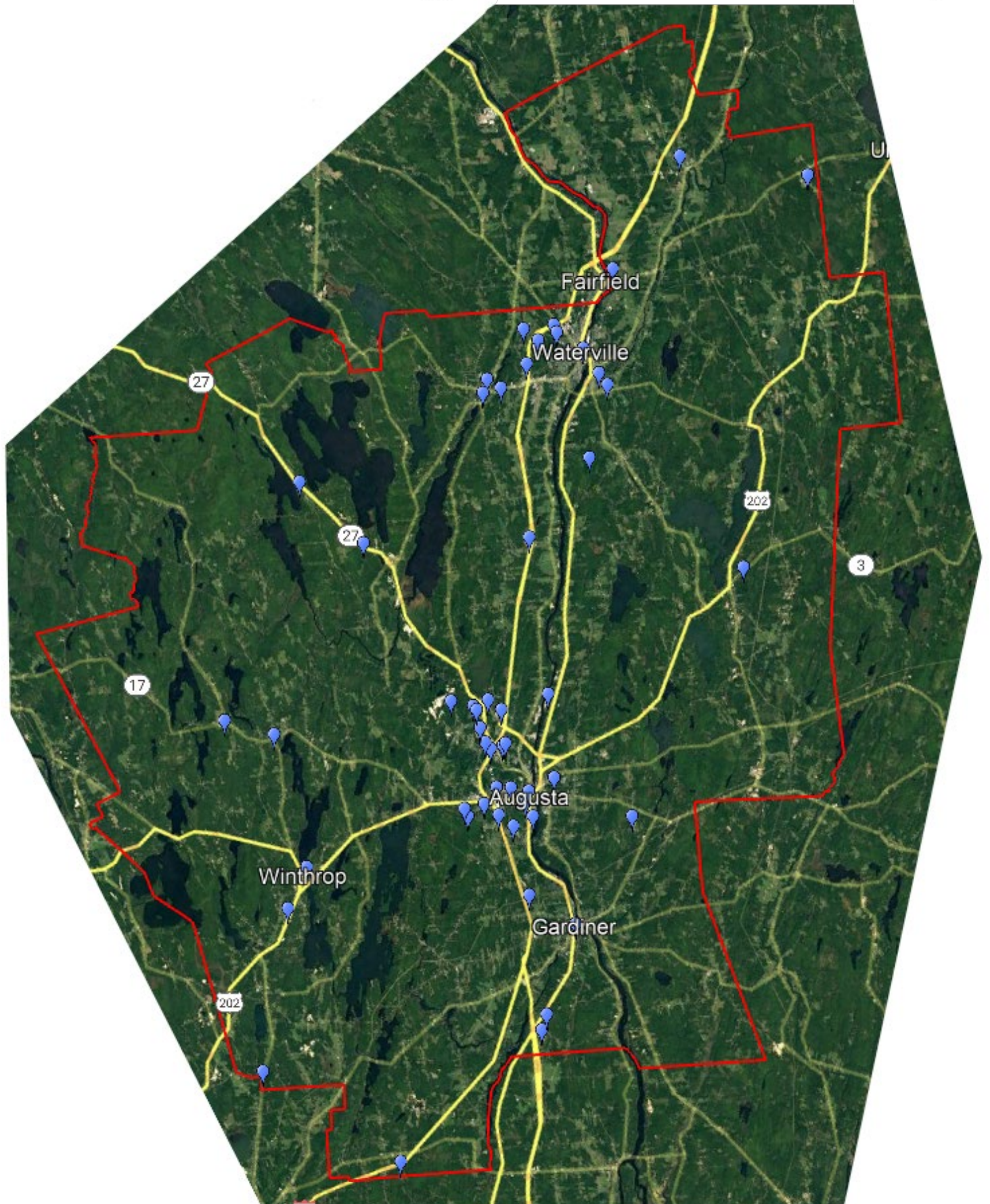
 MOBILITY CORRIDOR

# WINTHROP



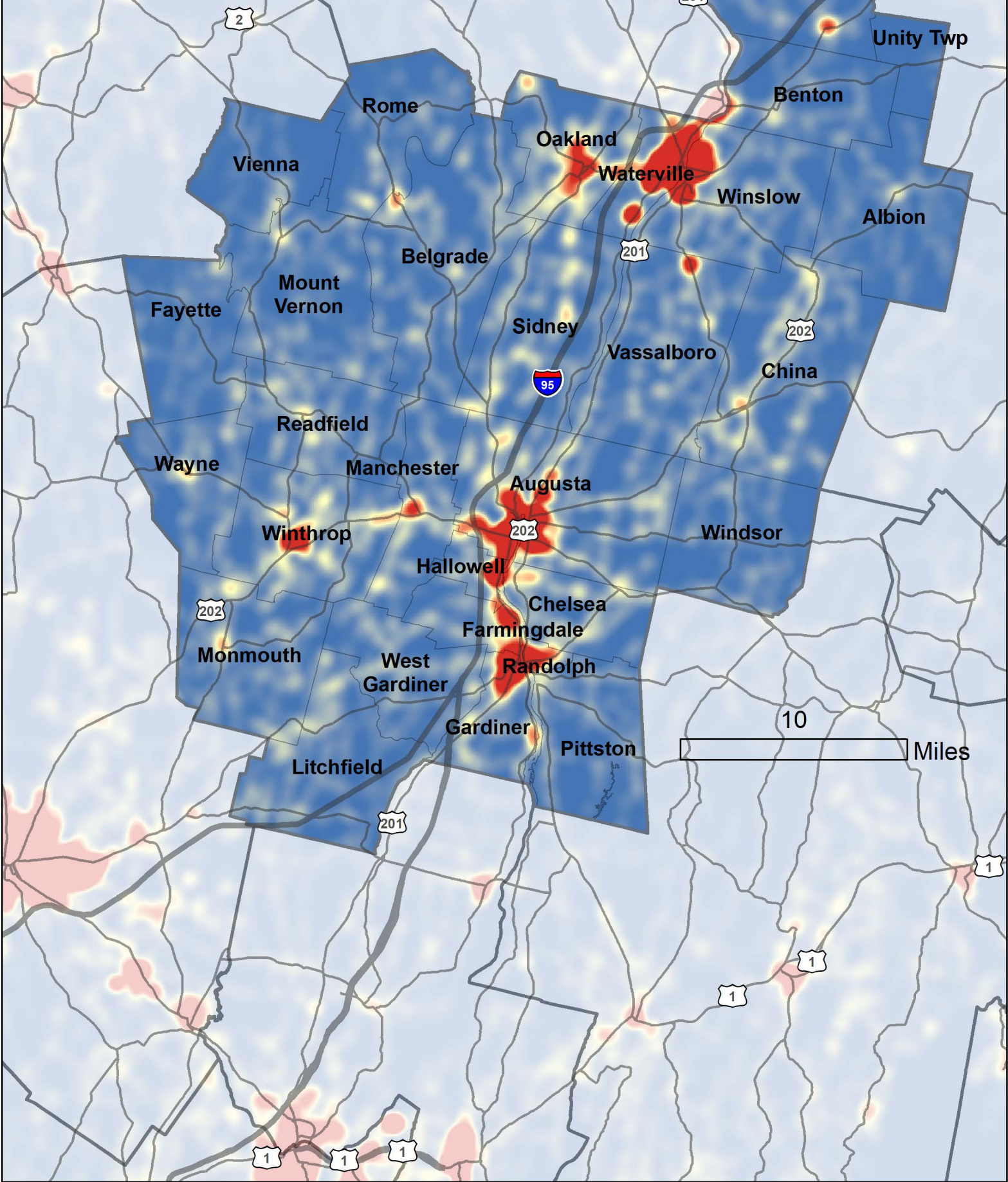
- |   |  |
|---|--|
|  BRIDGE                |  PUMP STATION             |
|  DAM                   |  WATER TREATMENT FACILITY |
|  LIBRARIES             |  TRANSFER STATION         |
|  CELL/RADIO TOWER      |  TRANSFORMER STATION      |
|  CITY/TOWN OFFICE      |  WATER TOWER              |
|  SCHOOLS               |  POWER LINES              |
|  PUBLIC WORKS          |  RAILROAD TRACKS          |
|  WINTHROP POLICE DEPT. |  MOBILITY CORRIDOR        |
|  WINTHROP EMS          |  |
|  WINTHROP FIRE DEPT.   |  |

**KENNEBEC COUNTY EXTREMELY HAZARDOUS  
SUBSTANCE SITES (EHS)  
2020 TIER II REPORT YEAR**



# Addressable structures per square mile

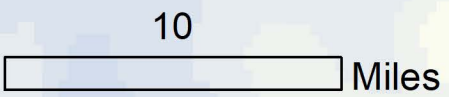
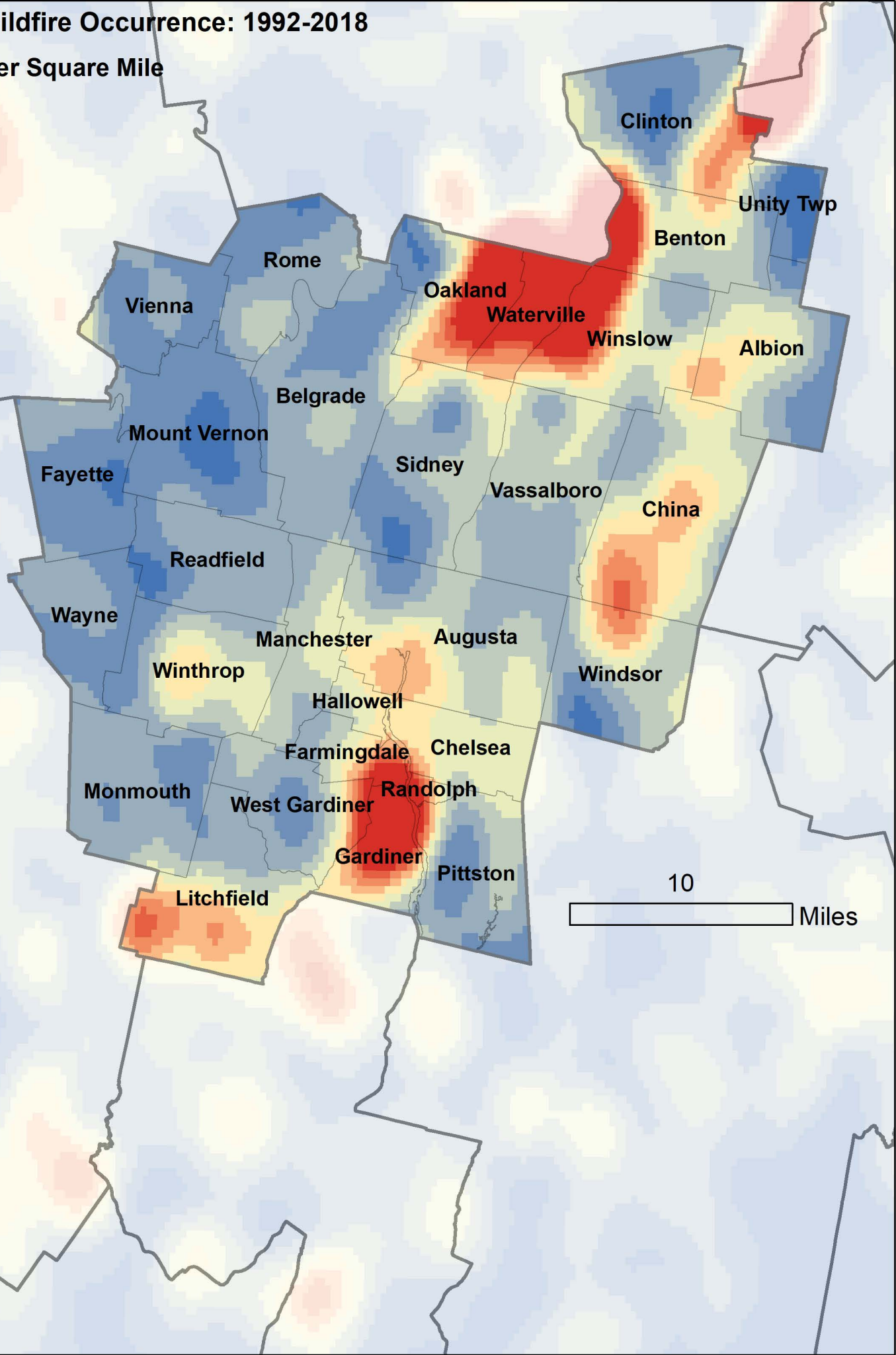
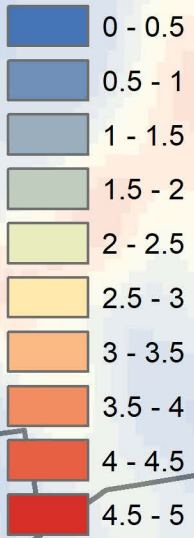
Value





# Historic Wildfire Occurrence: 1992-2018

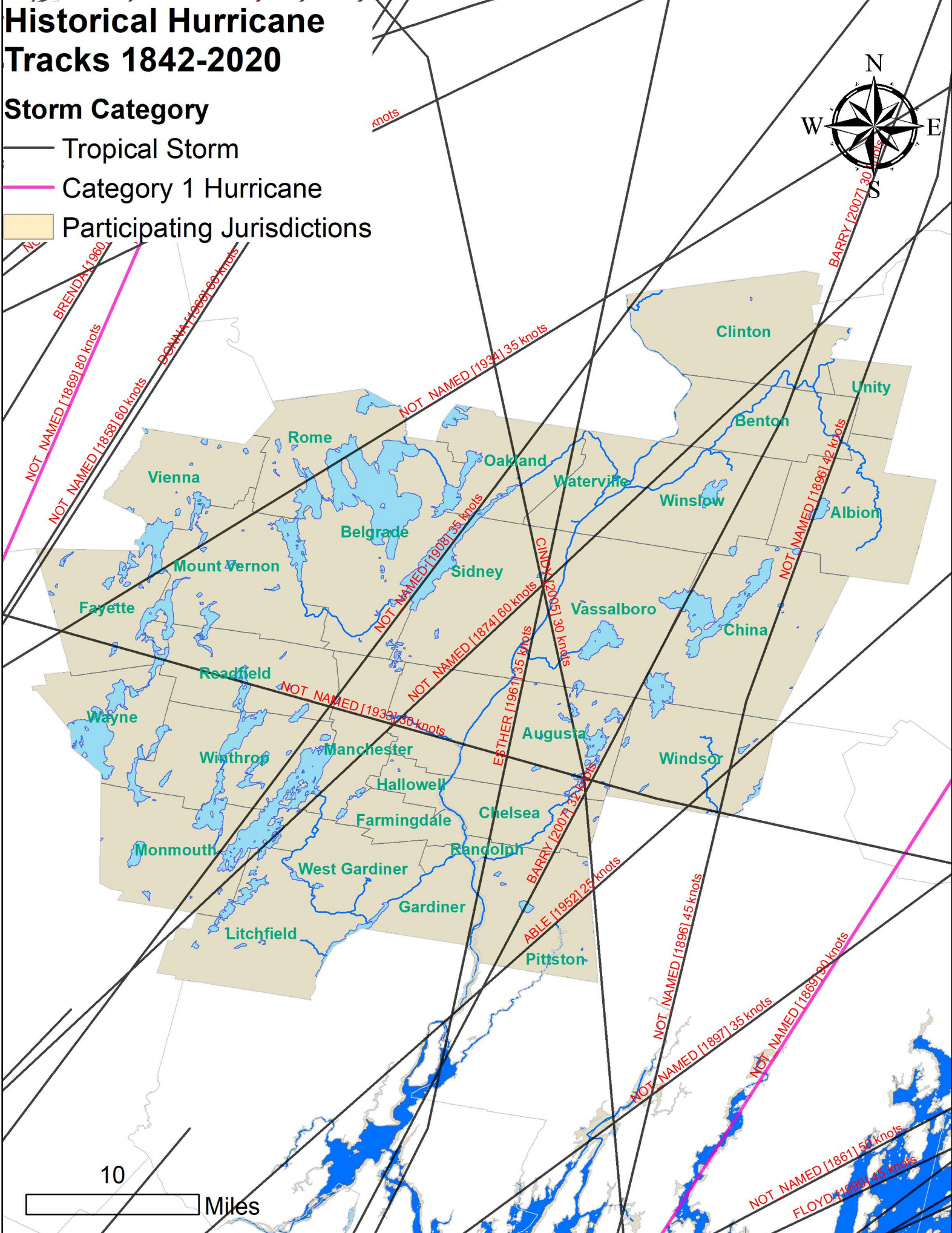
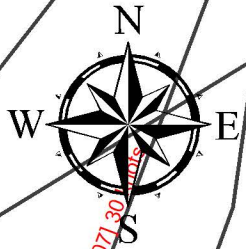
## Wildfires per Square Mile



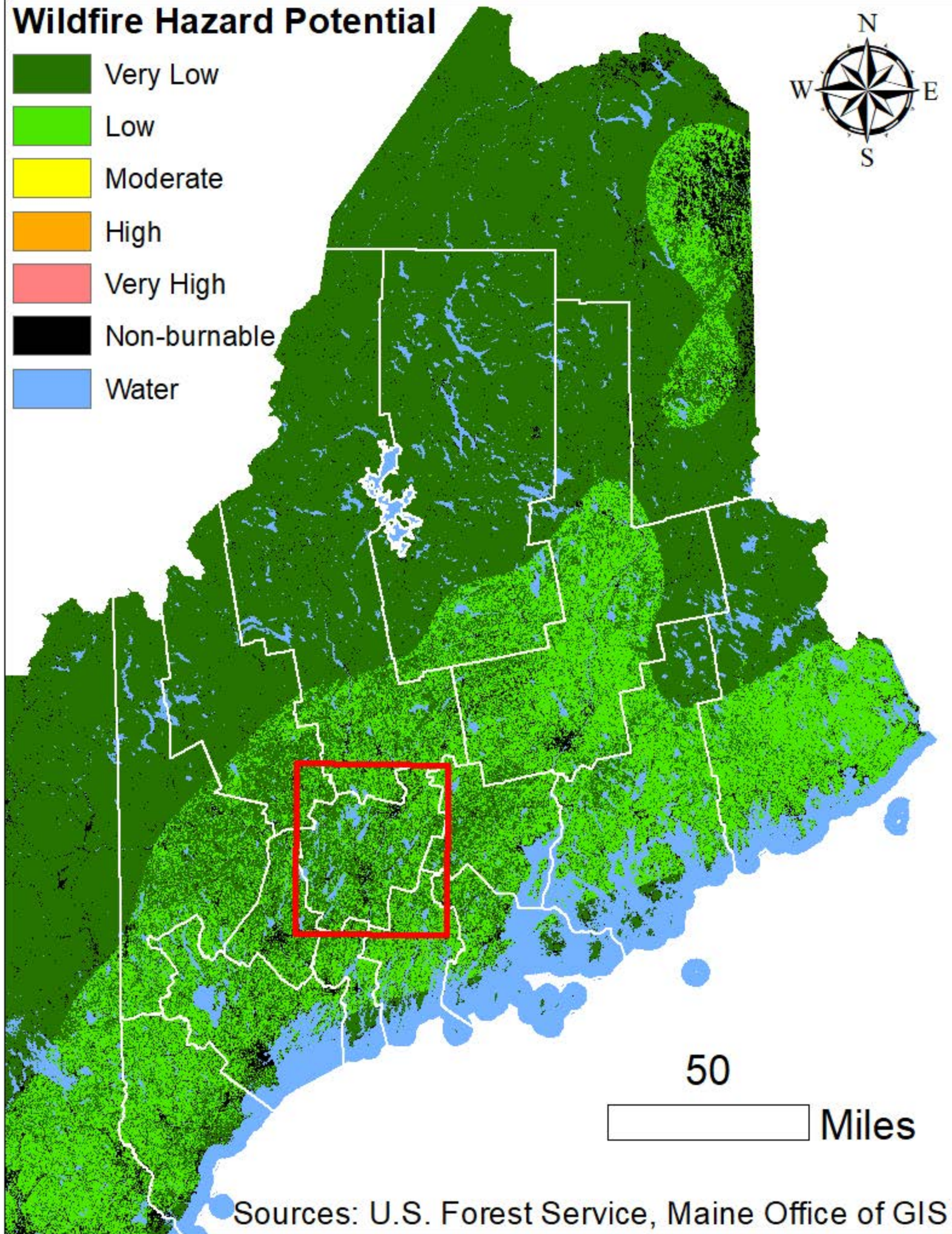
# Historical Hurricane Tracks 1842-2020

## Storm Category

- Tropical Storm
- Category 1 Hurricane
- Participating Jurisdictions



# Wildfire Hazard Potential



50

Miles

Sources: U.S. Forest Service, Maine Office of GIS

# APPENDIX A –

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY: Town of Albion</b>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: <b>We have no specific areas in town susceptible to flooding. We have many culverts where localized flooding may occur depending on ice and other conditions.</b>
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. <b>Most damage from severe storms occurs because of trees coming down onto power lines and into roadways. We have many areas where trees are heavy along the roadways.</b>
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. <b>Most damage from severe storms occurs because of trees coming down onto power lines and into roadways. We have many areas where trees are heavy along the roadways.</b>
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires: <b>The Bog Road area, areas around Lovejoy Pond, Pond Road, Abbott Road, Clark Road, and the Quaker Hill Road are at higher risk for structure damage due to a wildland fire. There are many camps and houses within the wooded areas. There are many more isolated areas in Town at risk.</b>
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded? <b>We don't have any regular areas that repetitively flood. We have drainage issues on Barnes Road that becomes almost impassable during spring thawing and times of severe rain.</b>
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): <b>They meet the 2nd and Fourth Monday of the Month at 6:30 pm.</b>

**8. Mitigation Team - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address: I may be interested depending on the time commitment. Andrew Clark, 207-680-0138, [aclark@albionfd.org](mailto:aclark@albionfd.org)**

Please get this back to the office as soon as possible before July 19<sup>th</sup> @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

**GAUD feedback**

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY:</b>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: <b>WWTP is vulnerable to significant flooding 10 to 25 year events; pump station 3 on Front Street is subject to risk under one to two year flood events</b>
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. <b>Design basis threat for GAUD is an ice storm where nearly all power is out and it is difficult to reach remote areas due to ice. Since 1998 we have mitigated a lot of sites but not all sites have generators but all sites are pre-wired and ready to accept portable wheeled generators (e.g. large double axle diesel generators, 100 kW etc)</b>
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. <b>same issues as ice storms – lots of downed lines / difficult to quickly reach remote sites</b>
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded? <b>Front Street is our biggest issue for flooding; other stations have been relocated out of flood areas; flooding is fairly common on Memorial Circle as MDOT stormwater system is old and becomes overwhelmed;</b>
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): <b>GAUD generally meets third Monday of each month</b>

8. **Mitigation Team** - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address: **I believe Phyllis Rand from our office is already a member; if not, 622-3701 prand@gaud.ws**

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.



Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY: Augusta</b>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: Front ST., Waterfront Park and the East side boat landing. Bangor Street, Sewall Street.
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. Kennebec River runs through the City so both sides of the river are susceptible to ice jams with the impact being more severe on the west side where the building are affected. Whole City is impacted with big winter storms.
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. Entire City with the country roads and people living on remote private roads most susceptible
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded? Front St. and Bangor St. Many areas have minor street flooding during heavy rain events.
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): City Council has two Business Meetings and two Informational Meetings a month.

**8. Mitigation Team** - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:

Please get this back to the office as soon as possible. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

<p>1. <b>NAME OF YOUR COMMUNITY: Belgrade</b></p>
<p>2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: Belgrade has five lakes within it: Great Pond, Long Pond, Messalonskee Lake, and McGrath Pond-Salmon Lake. Each has streams flowing into and from them, the most significant being Belgrade Stream, which connects Long Pond and Messalonskee. Properties along those lakes and streams are susceptible to flooding, depending upon the amount, rate and duration of rainfall.</p>
<p>3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. Ice jams are most likely to occur at Belgrade's three dams in its village, on Salmon Lake and on the Belgrade Stream along Wings Mills Road. Some hills, particularly on the Knowle, Minot Hill, West and Horse Point roads.</p>
<p>4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. Belgrade's village is most densely populated in a wooded area between Long and Great ponds. A recent microburst left some impressive destruction that left some without power for about a day. Power outages are not uncommon in Belgrade during severe weather, owing partly to it being a rural, heavily wooded area.</p>
<p>5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires: Belgrade is a rural, heavily wooded area that, depending upon conditions, could be a tinderbox. It sits at the base of the Kennebec Highlands, most of which is in conservation. Logging remains a significant industry here, which helps to control tree growth.</p>
<p>6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded? Improved stormwater infrastructure around Belgrade's lakes, particularly in the village, which is more developed, could help improve the flow and quality of water running into those waterbodies. One challenge is maintaining stormwater infrastructure, which easily becomes clogged by sand used in winter road maintenance.</p>
<p>7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): The Belgrade Board of Selectpersons meets twice monthly – on the first and third Tuesdays of the month.</p>

**8. Mitigation Team - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:**

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY:</b> Benton
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: Some parts of Pleasant Street and Comment Street – Kennebec River. Intersection of Albion Rd & East Benton Rd. Unity Rd on the town line with Unity
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams.
4. <b>All land area Kennebec River and Sabasticook River</b>
5. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc.
6. <b>All</b>
7. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:
8. <b>All</b>
9. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?
10. <b>None known</b>
11. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): 2 <sup>nd</sup> Monday of the month

12. **Mitigation Team** - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:

Please get this back to the office as soon as possible before July 19<sup>th</sup> @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

## Jason Decker

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**From:** Duane Bickford <dbickford@fairfieldme.com>  
**Sent:** Monday, August 2, 2021 08:25  
**To:** Jason Decker  
**Subject:** RE: Hazardous Mitigation Plan updates

Jason,

I just heard back from Benton, all the projects below are still considered to be deferred until funded

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**From:** Jason Decker [mailto:jason.decker@kcema.org]  
**Sent:** Wednesday, July 28, 2021 10:20 AM  
**To:** Duane Bickford <dbickford@fairfieldme.com>  
**Subject:** RE: Hazardous Mitigation Plan updates

Thank you

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**From:** Duane Bickford <dbickford@fairfieldme.com>  
**Sent:** Wednesday, July 28, 2021 10:15  
**To:** Jason Decker <jason.decker@kcema.org>  
**Subject:** RE: Hazardous Mitigation Plan updates

Jason,

I am not sure I will forward this to Benton select board.

---

**From:** Jason Decker [mailto:jason.decker@kcema.org]  
**Sent:** Wednesday, July 28, 2021 10:10 AM  
**To:** Duane Bickford <dbickford@fairfieldme.com>  
**Subject:** RE: Hazardous Mitigation Plan updates

Chief,

Thank you for the quick response to the survey. Can you take a look at this list of project that was submitted in 2016 and see if any have been completed and if they have when were they done.

Benton	1) East Benton Rd; Upsize 60" x 30' cmp with 4' x 8' x 40' bottomless box culvert and elevate 150' x 21' x 2' and repave.	\$60,000	L T
	2) McCarthy Rd: Upgrade twin 24" x 40' culverts. with 4' x 6' x 40' bottomless box culvert and riprap intake and outlet (dirt road. Beaver problem exacerbates flooding).	\$37,000	L T
	3 ) Bog Road; Elevate 300' x 21' x 18" on average, armor road and shoulders.	\$15,000	S T
	4) Handscomb Rd; Ditch 1,200'.	\$4,000	S T

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY: Chelsea</b>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: Butternut Park end of Ferry Rd and the area around 570 Windsor Rd
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. Town wide but including Butternut Park and possibility of the Intervale Rd along the Kennebec River
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. Townwide but especially town roads such as Hallowell Rd, Windsor Rd, Townhouse Rd and Hankerson Rd. Nelson Rd is especially bad due to its location and being a dead end road often is affected by rain and wind storms.
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires: Townwide
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded? Windsor Rd in area of 570. Ferry Rd at Butternut Park. Townhouse Rd by the large CMP power lines cross street is Sulya Rd
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): Every two week 2nd & 4th Wednesday of the month at 18:30 town office
8. <b>Mitigation Team</b> - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:



Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY:</b>	Town of China
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding:	Branch Mills Dam
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams.	None Known at this time
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc.	Clark Rd - gravel road - wash outs
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:	None Known at this time
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?	None Known at this time
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month):	every 2 weeks on Monday night
8. <b>Mitigation Team</b> - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:	No

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY: Clinton</b>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: Water St, Pleasant St (near the river), Main St (near the river), River Rd
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. All streets in town
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. All streets in town
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires: area the train tracks go through.
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?  N/A
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): 2 <sup>nd</sup> and 4 <sup>th</sup> Tuesday of the Month
8. <b>Mitigation Team</b> - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

Kennebec County Revised Hazard Mitigation Plan – 2011 Revision

Town (Kennebec County)	Potential Projects	Cost estimate 2010	Time line	Responsible Agency	Status as of 2010	Notes
(China)	5) Pleasant View Ridge Rd; Ditch and line with fractured stone 5,000' and upslope (8) 12" x 20' culverts with 15" x 20' HDPE driveway culverts.	\$58,000	8 weeks	Town Manager	New project	
	6) Dirigo Rd; Rebuild road sub base and base 3 miles, repave. Establish ditch 15,000'.	\$600,000	12 weeks	Town Manager	New project	
	7) Branch Mill Rd; Rebuild road sub base and base 3,000, repave. Ditch and line 1,200', upslope (3) 15" x 40' culverts with 18" x 40' HDPE and one (1) 15" x 40' culvert 18" x 40' HDPE culvert.	\$125,000	4 weeks	Town Manager	New project	
	8) Clark Rd; Ditch and line with fractured stone 1,000', add (1) 15" x 20' HDPE driveway culvert and crown road.	\$12,000	2 weeks	Town Manager	New project	
	9) Bog Rd; Upsize existing 15" x 40' culvert with 24" x 40' HDPE culvert and riprap intake and outlet.	\$2,800	1 week	Town Manager	New project	
	1) Johnson Flats Rd; Elevate roadway 600' x 21' x 2' on average and stabilize shoulders with geotextile and fractured stone.	on 250 \$40,000 787,100k	4 weeks	Hwy Foreman	New Project	on going \$75-150k
	2) True Rd; Upsize existing 72" x 40' culvert with 12" x 8' x 40' bottomless box culvert with integrated headwalls.	on 300 \$70,000 720,000	4 weeks	Hwy Foreman	New Project	June - Oct 20 22 more than \$200k
	3) Rogers Rd; Armor ditches 500' an line with fractures stone. Install check dams as needed, add 8" x 20" x 4000' surface gravel, shape and crown road.	\$35,000	4 weeks	Hwy Foreman	New Project	Site may have had PA funds some time in the past....
Clinton	4) Pease Rd; Add 15" x 40' HDPE culvert.	\$1,500	1 weeks	Hwy Foreman	New Project	
	1) 305 Water St; Acquire and remove house.	\$65,000	6 months	Town Manager	New Project	
	2) Water St; Farmingdale Town Hall and fire station relocate away from Kennebec River 8,000 sq'.	\$1,000,000	one year	Town Manager	New Project	Critical facility
Farmingdale	3) Access Rd; Build access road connecting Greely Drive, Hill Street, riverside Drive and Kennebec Street 1,400' x 20'.	\$45,000	8 weeks	Town Manager	New Project	Could be part or relocating town hall and fire station project #2.

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

<p>1. <b>NAME OF YOUR COMMUNITY: Hallowell</b></p>
<p>2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding:</p> <p><b>Kennebec River</b></p>
<p>3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams.</p> <p><b>Kennebec River</b></p>
<p>4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc.</p> <p><b>Entire City, but especially the Downtown area.</b></p>
<p>5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:</p> <p><b>The western part of the City, generally west of Interstate 95.</b></p>
<p>6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?</p> <p><b>The downtown area that borders the Kennebec River. Stormwater systems were upgraded in 2017-2018. Most buildings are older and not floodproofed.</b></p>
<p>7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month):</p> <p><b>City Council meets once a month on the first Monday after the first Tuesday of the month.</b></p>

**8. Mitigation Team - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:**

**The new City Manager, Gary Lamb, may be interested. He starts on August 9. He can be reached at [citymanager@hallowellmaine.org](mailto:citymanager@hallowellmaine.org).**

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.



# MONMOUTH FIRE DEPARTMENT

771 MAIN STREET  
PO Box 270  
MONMOUTH, ME 04259  
207-933-4545

Dan Roy, Fire Chief  
Jason Mills, 2<sup>nd</sup> Asst.  
Chief

Ed Pollard, 1<sup>st</sup> Asst. Chief  
Anthony Siderio, 3<sup>rd</sup> Asst. Chief

[WWW.MONMOUTHFIRE.COM](http://WWW.MONMOUTHFIRE.COM)

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1. Town of Monmouth
2. Most of the flooding our town experiences is a result of water runoff damage on the edges of roadways or overrun/plugged culverts. The plugged culverts can result from beavers, debris pile-up or just excessive water buildup. The Sanborn, Waugan and Annabessacook Roads have historically been an issue with minor flooding of the roadways. As far as water runoff, Welch, Berry, Waugan, Academy, Blue, Norris Hill, Oak Hill Roads and Oak Hill Acres have had erosion damage.
  - a. Note, the culvert was recently replaced at the Sanborn Road, so flooding of this road will hopefully be mitigated going forward.
  - b. The culvert near the Wilson Pond Road/boat ramp is scheduled to be replaced in the upcoming year. This culvert replacement will hopefully mitigate damage to that area.
  - c. The Waugan Road bridge should be replaced and raised however, this is a DOT bridge.
3. The only major ice dam issue is on Jug Stream which flows from Anabessacook Lake into Cobbossee Lake at the East Monmouth Dam. Drifting snow is very problematic on the following roadways: Route's 132 (Main St.), 135, Cobbossee, Ridge, and Norris Hill Roads. Downed trees and power lines from snow/ice storms are always an issue, which is widespread.
4. Summer storms are usually widespread with downed trees and power lines. There are no isolated areas that experience more damage than others. The utility company has done a great job in the past few years pruning back trees from power lines.
5. Wildland fires are always a threat, especially with the dense woods and farm land in our area. A railroad runs through the center of our town, which has sparked fires in the past. We also have a lot of seasonal residents. There are approximately 100 miles of camp roads that have seasonal and year-round dwellings on five bodies of water; Cochnewagan, Wilson, Cobbossee, Annabessacook and Tacoma Lakes.
6. A lot of the areas that have a history of flooding were already outlined in question #2. The railroad also has a few culverts that have been known to get plugged up as well, which they police frequently and maintain.
7. Our selectmen & town manager meet every other Wednesday at 6:00 pm at the town hall.
8. At this time, I am not interested in serving on the Kennebec County Hazard Mitigation Planning Team.

Thanks,

Dan Roy, Fire Chief  
Monmouth Fire Department



Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY:</b>	<i>Oakland</i>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding:	<i>MINOR STREET FLOODING, MESSAQUISHUE SUMMIT @ WATER STREET USUALLY MINOR</i>
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams.	<i>WINTER STORMS - TOWN WIDE</i>
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc.	<i>SUMMER STORMS TOWN WIDE LAKEFRONT PROPERTY</i>
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:	<i>RAILROAD CORRIDOR</i>
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?	<i>NOT KNOWN</i>
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month):	<i>1<sup>ST</sup> &amp; 4<sup>TH</sup> WEDNESDAY'S</i>
8. <b>Mitigation Team</b> - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:	

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

1. <b>NAME OF YOUR COMMUNITY:</b> <b>City of Waterville</b>
2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: <b>Water Street, Front Street, Areas Boarding the Kennebec and Messalonskee Stream</b>
3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. <b>The City of Waterville borders the Kennebec River, which is know to be susceptible to ice jams. None have caused catastrophic failure at this time.</b>
4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. <b>The City of Waterville is susceptible to severe storms. During microburst conditions is it not uncommon to yield 60 – 80 calls for service for trees and lines down.</b>
5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires: <b>Quarry Road, Devils Chair Rockface</b>
6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded? <b>Water Street specifically the Hathaway parking lot and boat landing.</b>
7. <b>Governance</b> - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): <b>Twice per month. First and Third Tuesday</b>

8. **Mitigation Team** - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address: **Fire Chief Shawn Esler 207-314-1497 [sesler@waterville-me.gov](mailto:sesler@waterville-me.gov)**

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

1) <b>Drummond Rd;</b> Ditch 2,300' and reset 18" x 50' culvert.	\$9,200	Short Term	Public Works	Deferred; lack of funds
2); <b>County Rd;</b> Riprap intake and outlet of existing 48" culvert and add 4' x 6' x 6' stone lined plunge pool.	\$4,000	Short Term	Public Works	Completed culvert replacement, unable to fund plunge pool.
3) <b>West River Rd;</b> Upsize 18" x 100' culvert with 3' x 2' x 100' bottomless box culvert.	\$45,000	Long Term	Public Works	Deferred; lack of funds
4) <b>West River Rd at Abenaki;</b> culvert upsize and ditching required.	\$7,000	Short Term	Public Works	2021 Need
5) <b>Paul Ave;</b> drainage	\$35,000	Short Term	Public Works	2021 Need
6) <b>Eight Rod Rd;</b> culvert replacement time 2 and upsize to boxed or bottomless style.	\$90,000	Long Term	Public Works	2021 Need
7) <b>Upper Main Street;</b> culvert upsize and replacement.	\$10,000	Short Term	Public Works	2021 Need

Thank you all for your cooperation with this project.

Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

<p>1. <b>NAME OF YOUR COMMUNITY: Town of Wayne</b></p>
<p>2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding:</p> <p><b>Seasonally, every spring, after the winter snow melts in the mountains the Androscoggin River floods. This spring flood causes the Dead River to reverse flow filling up the Androscoggin Lake Basin. Several lakefront properties are susceptible to high water events on Androscoggin Road. During high water events one neighborhood (West Acres) cannot access the Town Road.</b></p> <p><b>The Town owns two dams: 1) Village Dam, holding back Pocasset; 2) North Wayne Dam, holding back Lovejoy Pond.</b></p>
<p>3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams.</p> <p><b>Our whole community is susceptible to severe winter storms. Heavy snow/ ice storms take down trees frequently causing long duration power outages.</b></p>
<p>4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc.</p> <p><b>Our whole community is susceptible to severe summer storms. Heavy rains and windstorms take down trees frequently causing long duration power outages and washing out roadsides. Ie. House Road, Hardscrabble Road, Dexter Pond Roads</b></p>
<p>5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:</p> <p><b>Much of Wayne is forested and susceptible to wildfire. Wayne is a member of the Lakes Region Mutual Aid Group and works closely with Maine Forest Service to respond to wildfire and mitigate property damage.</b></p>
<p>6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?</p>

**1.) House Road ditches needs some rip rap and check dam installed to slow water down to prevent road washouts;**

**2.) Tempe Bridge culvert needs upgrading;**

**3.) Several sections of Dexter Pond Road and Hardscrabble Road need to be widened and ditches installed to prevent road washouts; Several sections have been improved since last Plan.**

**4.) The Town is working with a local contractor to remove hazard trees.**

**7. Governance - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month):**

**The Selectboard meets first and third Tuesday of each month**

**8. Mitigation Team - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:**

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

**Jason Decker**

**From:** Debra <navycaptpomi0031@gmail.com>  
**Sent:** Monday, August 2, 2021 11:55  
**To:** Jason Decker  
**Cc:** Angela Phillis  
**Subject:** Re: 2016 Word Format

I just recreated and updated it in spreadsheet format. It is "attached" here.

Thank you.  
Deb Couture  
EMD  
Town of West Gardiner

**2021 TOWN OF WEST GARDINER**

	1) Indiana Road: Elevate 900' x 22' x 2' on average and repave. Upsize 15" x 40' cmp to 24" x 40' HDPE culvert.	\$38,000.00	Long Term	Board of Selectman	Deferred: Lack of Funds.	
	2) Stoneham Drive Site 1: Replace 24" x 40' cmp with 24" x 40' HDPE culvert and remove ledge 36" x 40' x 24" and reset 24" x 40' culvert.	\$6,500.00	Long Term	Board of Selectman	Deferred: Current culvert working well. Will replace with upgraded culvert when required.	
	3) Bog Hill Road: Upsize 48" x 40' cmp with 4' x 6' x 40' bottomless box culvert and elevate 500' x 22' x 2' and repave.	\$48,000.00	Long Term	Board of Selectman	Deferred: Lack of Funds	

West Gardiner	4) Old Lewiston Road: Stabilize 500' x 4' with geotextile fabric and fractured stone and upsize existing 18" x 40' cmp with 24" x 40' HDPE culvert.	\$6,000.00	Long Term	Board of Selectman	Deferred: Current culvert working well. Will replace with upgraded culvert when required.
	5) Stoneham Dive Site 2: Elevate 2000' x 22' x 2' and upsize (10) 12" x 30' cmps with 18" x 30' HDPE driveway culverts.	\$72,000.00	Long Term	Board of Selectman	Deferred: Lack of Funds
	6) Benson Road: Upsize 15" x 40' cmp with 24" x 40' HDPE culvert.	\$3,500.00	Long Term	Board of Selectman	Deferred: Current culvert working well. Will replace with upgraded culvert when required.
	7) Hinkley Road: Elevate 1000' x 22' x 12" and upsize 12" x 40' cmp with 18" x 40' HDPE culvert.	\$81,000.00	Long Term	Board of Selectman	Deferred: Lack of Funds

On Mon, Aug 2, 2021 at 11:40 AM Jason Decker <[jason.decker@kcema.org](mailto:jason.decker@kcema.org)> wrote:

Good Morning,

I have attached the word version of the file that you submitted in 2015 for the 2016 plan. You should be able to edit this and send it back. Thank you so much for getting this done.

*Jason A Decker*





Good afternoon,

Back in September of 2020 a survey was sent out to the Local EMA personnel, the purpose of this was to identify any issues as well as starting work on the Hazard Mitigation Plan. We have not heard from some of you and need the information so that we can get this plan into FEMA for review and have it adopted by the County Commissioners. Please review your plans that you have currently and let us know what projects have been completed since the last update and projected projects for the next 5-7 years. The following information is placed into the plan as well:

<p>1. <b>NAME OF YOUR COMMUNITY:</b> Town of Winslow</p>
<p>2. <b>FLOODING</b> - Identify areas in your municipality that are susceptible to damages from flooding: The area susceptible to damage from flooding is the south end of Lithgow Street when the Kennebec reaches flood stage.</p>
<p>3. <b>SEVERE WINTER STORMS</b> - Identify areas in your municipality that are susceptible to severe winter storms – including ice jams. Some of the hilly streets such as Halifax Street and Clinton Avenue become difficult to maintain during heavy snow. China Road west of Reynolds Road becomes an issue during heavy snow due to MDOT's difficulty keeping up with the snowfall. Garland and Albion Roads experience drifting during windy events, as does Taylor and Maple Ridge Roads.</p>
<p>4. <b>SEVERE SUMMER STORMS</b> - Identify areas in your municipality that are susceptible to severe summer storms and the effects of power outages, debris removal, etc. We have two areas that experience repeated street flooding during heavy rain events. China Road in the area of Bay Street because the drainage pipe that carries a stream across the McDonalds property is undersized and gets overwhelmed and runs out to the China Road and overflows the drainage system. The second area is on Robert Street that has an under sized drainage system.</p>
<p>5. <b>WILDFIRE/URBAN INTERFACE</b> - Identify areas in your municipality that are susceptible to wildfire/forest fires/wildland fires:</p>
<p>6. <b>HISTORY OF DAMAGES</b> - Are there areas in your community that repetitively flood? Do you have any stormwater drainage systems (culverts, catch basins, drain pipes, etc) that need to be upgraded?</p> <p>Much of the drainage system on Cushman Road and the Sunset Heights development need to be rebuilt and enlarged. Some areas need to be re-directed to decrease the flows crossing the McDonalds property (as noted above). We are presently designing improvements for Sunset Heights and Robert Street. Funding is the critical issue to address these areas.</p>

7. **Governance** - When does your Select Board, Board of Assessors or City Council regularly meet (e.g. first Monday of the month): The second Monday of each month.

8. **Mitigation Team** - If you would like to serve on the Kennebec County Hazard Mitigation Planning Team, please provide your name, phone number and email address:

Please get this back to the office as soon as possible before August 6th @ 4PM. If you have any questions please feel free to contact the office 623-8407 and ask for Jason or Ted.

Thank you all for your cooperation with this project.

# APPENDIX B –

# KENNEBEC COUNTY EMERGENCY MANAGEMENT

## 2020 HAZARD MITIGATION SURVEY RESULTS

In preparation for a review of the Kennebec County Hazard Mitigation Plan, Kennebec County Emergency Management (EMA) created a survey on the readiness, hazards, and ongoing mitigation projects of the municipalities of Kennebec County. Due to difficulties created by COVID-19, Kennebec County EMA was not able to go out in the community as in previous years. Kennebec County EMA choose to conduct an on-line survey in an effort to streamline the data recovery and in an effort to engage regular citizens that reside in the county. The survey was published via email and social media in September of 2020 and remained open for a few weeks until October of 2020. Twelve municipalities and three engaged citizens (EC) participated with six people starting the survey but not completing it.

## Table of Contents

Page 3 – Question 1	<i>In the past five years, how many times has your municipality (or yourself) contacted KCEMA for assistance?</i>
Page 4 – Question 2	<i>Has your municipality (or yourself) had any communication problems with KCEMA either during a crisis or during normal business?</i>
Page 5 – Question 3	<i>Does your municipality have an established Emergency Operation Center (EOC) and how fast can your municipality get it operational?</i>
Page 6 – Question 4	<i>Do all of the members of your Emergency Operations Center and municipal staff have the required training?</i>
Page 7 – Question 5	<i>Are there any additional training's you would like to take place for your municipality?</i>
Page 8 – Question 6	<i>If there is a training your municipality, or you as an individual, would like to participate in but was not on the list, please comment below.</i>
Page 9 – Question 7	<i>Of the following hazards, please rank numerically(1 being the highest threat) which hazards would have the greatest impact to the least impact on your municipality?</i>
Page 10 – Question 8	<i>If there are hazards that were not listed in the previous question but you feel should be added, please list them below.</i>
Page 11 – Question 9	<i>In the event of a disaster, how prepared is your municipality?</i>
Page 12 – Question 10	<i>Which parts of your community are prone to flooding?</i>
Page 13 – Question 11	<i>What are your planned infrastructure projects planned over the next five years? (Roads, bridges, ect.)</i>
Page 14 – Question 12	<i>What mitigation projects have you completed in the past five years? (Roads, bridges, ect.)</i>
Page 15 – Question 13	<i>Are there any changes in the Kennebec County Hazard Plan that need to be addressed to better fit your municipality?</i>
Page 16 – Question 14	<i>Are there any improvements you feel are needed to better prepare your municipality for a disaster?</i>

mm	Town	Q1.) In the past five years, how many times has your municipality (or yourself) contacted KCEMA for assistance?
82697307	Oakland (EC)	No Answer
82698476		
82707867	Gardiner	3-4 Times a year
82714029	Vassalboro	I do not know
82721237	Readfiled	1-2 Times a year
82756630	Benton (EC)	3-4 Times a year
82826934	Monmouth	1-2 Times a year
82847823	China	I do not know
82942228		
83183621	Albion	1-2 Times a year
83593417	Benton	I do not know
83753155		
83757692		
84415295	Oakland	I do not know
84475274	Sidney (EC)	3-4 Times a year
84476119	Waterville	3-4 Times a year
84499847		
84529536		
84574582	China	3-4 Times a year
85137941	West Gardiner	1-2 Times a year
85414460	Winthrop	At least once a month

Response ID	Timestamp (mm/dd/yyyy)	Town	Q2.) Has your municipality (or yourself) had any communication problems with KCEMA either during a crisis or during normal business?
82697307	09/28/2020 07:55	Oakland (EC)	No Answer
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	No
82714029	09/28/2020 10:33	Vassalboro	No
82721237	09/28/2020 11:07	Readfiled	No
82756630	09/28/2020 14:53	Benton (EC)	No
82826934	09/29/2020 04:51	Monmouth	No
82847823	09/29/2020 08:07	China	Yes during both
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	No
83593417	10/05/2020 09:52	Benton	I do not know
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	Yes during normal business
84475274	10/13/2020 08:31	Sidney (EC)	No
84476119	10/13/2020 08:40	Waterville	No
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	No
85137941	10/18/2020 21:28	West Gardiner	No
85414460	10/20/2020 13:54	Winthrop	I do not know
			Those who answered yes did not provide an explanation.

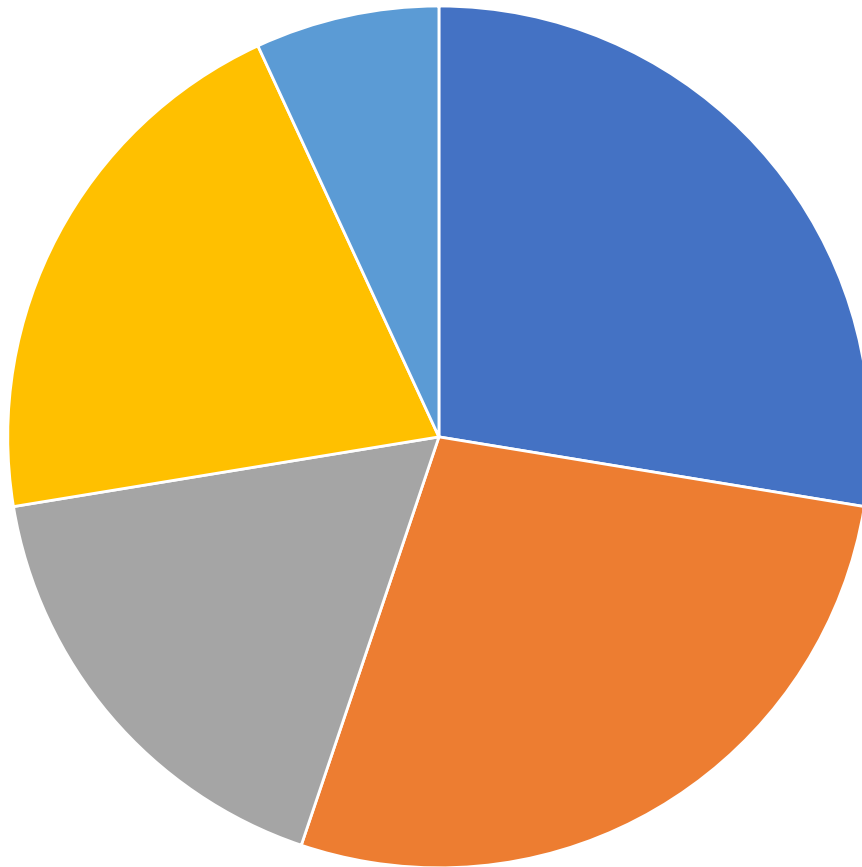
Response ID	Timestamp (mm/dd/yyyy)	Town	Q3.) Does your municipality have an established Emergency Operation Center (EOC) and how fast can your municipality get it operational?
82697307	09/28/2020 07:55	Oakland (EC)	No Answer
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	Yes and it would take about an hour
82714029	09/28/2020 10:33	Vassalboro	I am not aware of an established EOC
82721237	09/28/2020 11:07	Readfiled	Yes and it would take a few hours
82756630	09/28/2020 14:53	Benton (EC)	No, our town does not have the necessary equipment to establish an EOC
82826934	09/29/2020 04:51	Monmouth	Yes and it would take about an hour
82847823	09/29/2020 08:07	China	Yes and we are not sure how long it would take to establish out EOC
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	No, our town does not have the necessary equipment to establish an EOC
83593417	10/05/2020 09:52	Benton	No, our town does not have the necessary equipment to establish an EOC
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	No, our town does not have the necessary equipment to establish an EOC
84475274	10/13/2020 08:31	Sidney (EC)	Yes and we are not sure how long it would take to establish out EOC
84476119	10/13/2020 08:40	Waterville	Yes and it would take about an hour
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	Yes and it would take about an hour
85137941	10/18/2020 21:28	West Gardiner	Yes and it would take a few hours
85414460	10/20/2020 13:54	Winthrop	



Response ID	Timestamp (mm/dd/yyyy)	Q4.) Do all of the members of your Emergency Operations Center and municipal staff have the required training?
82697307	09/28/2020 07:55	No Answer
82698476	09/28/2020 08:06	
82707867	09/28/2020 09:27	I do not know
82714029	09/28/2020 10:33	I do not know
82721237	09/28/2020 11:07	Some members still need training
82756630	09/28/2020 14:53	Some members still need training
82826934	09/29/2020 04:51	Yes all members have had the required training
82847823	09/29/2020 08:07	I do not know
82942228	09/29/2020 17:26	
83183621	10/01/2020 12:58	No, most or all members need training
83593417	10/05/2020 09:52	I do not know
83753155	10/06/2020 11:54	
83757692	10/06/2020 12:23	
84415295	10/12/2020 18:07	Yes all members have had the required training
84475274	10/13/2020 08:31	Yes all members have had the required training
84476119	10/13/2020 08:40	Some members still need training
84499847	10/13/2020 11:41	
84529536	10/13/2020 15:14	
84574582	10/13/2020 21:17	I do not know
85137941	10/18/2020 21:28	Some members still need training
85414460	10/20/2020 13:54	

Q5.)

Are there any additional training's you would like to take place for your municipality? (Please select all that apply)



- National Incident Management System (NIMS)
- KCEMAs job and what we can do to help
- Tier II Reporting and what is it for
- Hazard Mitigation Training
- Other

Response ID	Timestamp (mm/dd/yyyy)	Town	Q6.) If there is a training your municipality, or you as an individual, would like to participate in but was not on the list, please comment below.
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	
82714029	09/28/2020 10:33	Vassalboro	
82721237	09/28/2020 11:07	Readfiled	
82756630	09/28/2020 14:53	Benton (EC)	
82826934	09/29/2020 04:51	Monmonth	
82847823	09/29/2020 08:07	China	I don't know what is available or appropriate.
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	
83593417	10/05/2020 09:52	Benton	
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	ICS 100, 200, 700, 800 for municipal leaders.
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	
85137941	10/18/2020 21:28	West Gardiner	
85414460	10/20/2020 13:54	Winthrop	

Q7.) Of the following hazards, please rank numerically(1 being the highest threat) which hazards would have the greatest impact to the least impact on your municipality?											
Response ID	Timestamp (mm/dd/yyyy)	Town	Summer Storms	Winter Storms	Flooding	Flooding due to Ice Jams	Wildand Fires	Other Not Listed			
82697307	09/28/2020 07:55	Oakland (EC)									
82698476	09/28/2020 08:06										
82707867	09/28/2020 09:27	Gardiner	5	4	2	1	3	6			
82714029	09/28/2020 10:33	Vassalboro	1	2	4	5	3	6			
82721237	09/28/2020 11:07	Readfiled	2	1	3	5	4	6			
82756630	09/28/2020 14:53	Benton (EC)	2	3	1	4	5	6			
82826934	09/29/2020 04:51	Monmouth	2	1	4	5	3	6			
82847823	09/29/2020 08:07	China	2	1	5	4	3	6			
82942228	09/29/2020 17:26										
83183621	10/01/2020 12:58	Albion	2	1	4	5	3	0			
83593417	10/05/2020 09:52	Benton	1	2	3	5	4	6			
83753155	10/06/2020 11:54										
83757692	10/06/2020 12:23										
84415295	10/12/2020 18:07	Oakland	2	1	4	5	3	6			
84475274	10/13/2020 08:31	Sidney (EC)	1	2	3	5	4	6			
84476119	10/13/2020 08:40	Waterville	2	3	5	6	4	1			
84499847	10/13/2020 11:41										
84529536	10/13/2020 15:14										
84574582	10/13/2020 21:17	China	2	1	3	5	4	6			
85137941	10/18/2020 21:28	West Gardiner	1	2	4	5	3	6			

Response ID	Timestamp (mm/dd/yyyy)	Town	Q8.) If there are hazards that were not listed in the previous question but you feel should be added, please list them below.
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	
82714029	09/28/2020 10:33	Vassalboro	
82721237	09/28/2020 11:07	Readfiled	COVID?
82756630	09/28/2020 14:53	Benton (EC)	
82826934	09/29/2020 04:51	Monmonth	Hazmat incidents involving railroad, vehicle transport or industrial structures
82847823	09/29/2020 08:07	China	
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	
83593417	10/05/2020 09:52	Benton	
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	COVID19
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	
85137941	10/18/2020 21:28	West Gardiner	cyber
85414460	10/20/2020 13:54	Winthrop	

Response ID	Timestamp (mm/dd/yyyy)	Town	Q9.) In the event of a disaster, how prepared is your municipality?
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	We have limited resources to handle most disasters and require local mutual aid
82714029	09/28/2020 10:33	Vassalboro	We have very limited resources and are dependent on outside help
82721237	09/28/2020 11:07	Readfiled	We have the resources to handle most disasters on our own
82756630	09/28/2020 14:53	Benton (EC)	We have the resources to handle most disasters on our own
82826934	09/29/2020 04:51	Monmouth	We have the resources to handle most disasters on our own
82847823	09/29/2020 08:07	China	I do not know
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	We have limited resources to handle most disasters and require local mutual aid
83593417	10/05/2020 09:52	Benton	We have limited resources to handle an isolated disaster and would require additional county and state resources.
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	We have the resources to handle most disasters on our own
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	We have limited resources to handle most disasters and require local mutual aid
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	We have the resources to handle most disasters on our own
85137941	10/18/2020 21:28	West Gardiner	We have the resources to handle most disasters on our own
85414460	10/20/2020 13:54	Winthrop	

Response ID	Timestamp (mm/dd/yyyy)	Town	Q10.) Which parts of your community are prone to flooding?
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	Our Downtown
82714029	09/28/2020 10:33	Vassalboro	No known flooding hazard areas.
82721237	09/28/2020 11:07	Readfiled	stream crossings and some intermittent streams in heavy rain events.. Dams on the lakes are functioning much better and lakefront issues are mostly resolved.
82756630	09/28/2020 14:53	Benton (EC)	Small section along the Kennebec River and Smaller section along the Sabasticook river
82826934	09/29/2020 04:51	Monmonth	Small streams, culverts and back water areas (minor) - several locations
82847823	09/29/2020 08:07	China	
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	Local roads can be prone to flooding and damage from small streams
83593417	10/05/2020 09:52	Benton	Flood Zone areas
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	None
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	Water Street
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	Around our larger brooks and streams
85137941	10/18/2020 21:28	West Gardiner	Several areas near streams and on one low lying road.
85414460	10/20/2020 13:54	Winthrop	

Response ID	Timestamp (mm/dd/yyyy)	Town	Q11.) What are your planned infrastructure projects planned over the next five years? (Roads, bridges, ect.)
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	Currently Replacing both major bridges in downtown
82714029	09/28/2020 10:33	Vassalboro	Culvert replacement on Cross Hill Road and Gray Road with assistance of DEP stream crossing grants. We do road cross-culvert replacements and brush cutting every year in anticipation of annual paving projects.
82721237	09/28/2020 11:07	Readfiled	Paving, potential removal of a redundant bridge that has been out of service for over a decade.
82756630	09/28/2020 14:53	Benton (EC)	unkn
82826934	09/29/2020 04:51	Monmonth	Culvert on Wilson Pond Road by boat ramp for Wilson Pond is next planned project. Bridge on Waugan Road needs replacing (DOT bridge, though). This bridge was shut down last year due to flooding over roadway.
82847823	09/29/2020 08:07	China	
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	Paving, ditching and clearing brush/trees from besides roads Our Economic Development Committee would be able to provide this
83593417	10/05/2020 09:52	Benton	
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	Some various road repairs
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	Trafton Road, Ticonic Bridge, Downtown Main Street, many other projects.
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	Changing old drainage pipes and paving roads Salt Shed updates
85137941	10/18/2020 21:28	West Gardiner	
85414460	10/20/2020 13:54	Winthrop	



Response ID	Timestamp (mm/dd/yyyy)	Town	Q12.) What mitigation projects have you completed in the past five years? (Roads, bridges, ect.)
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	New bridge on Maine Ave. Upgraded communications infrastructure and hardened our tower site.
82714029	09/28/2020 10:33	Vassalboro	Brush cutting/clearing and cross-culvert replacements in anticipation of road paving for the following roads: Lombard Dam, Nelson, Bog, Whitehouse, Cross Hill, Hannaford Hill, Holman Day, Hunt, Taber Hill, Cushnoc, Mill
82721237	09/28/2020 11:07	Readfiled	As noted, extensive repairs to both the Maracaibo Outlet and Torsey Pond Dams. Several roadway culvert replacements.
82756630	09/28/2020 14:53	Benton (EC)	unkn
82826934	09/29/2020 04:51	Monmonth	Replaced culvert on Sanborn Road, which resolved flooding of back water area that dumps into Jug Stream for Cobbossee Lake. In summer 2020, the gravel Packard and Gilman Roads were paved with new culverts and
82847823	09/29/2020 08:07	China	
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	Paving and ditching of roads, cutting brush near roadways.
83593417	10/05/2020 09:52	Benton	unsure
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	Hussey hill road, ditching and culverts around town
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	roads bridges
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	Causeway bridge replaced, Pleasant View Ridge multi plate replacement, and large culvert replaced on IIV Brook Rd
85137941	10/18/2020 21:28	West Gardiner	Many roads have been repaved. One dam has been upgraded.
85414460	10/20/2020 13:54	Winthrop	

Response ID	Timestamp (mm/dd/yyyy)	Town	Q13.) Are there any changes in the Kennebec County Hazard Plan that need to be addressed to better fit your municipality?
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	Not that I am aware of
82714029	09/28/2020 10:33	Vassalboro	Unknown
82721237	09/28/2020 11:07	Readfiled	More on Pandemics and 'virtual' EOCs
82756630	09/28/2020 14:53	Benton (EC)	unkn
82826934	09/29/2020 04:51	Monmonth	No
82847823	09/29/2020 08:07	China	
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	no
83593417	10/05/2020 09:52	Benton	I would need to review the plan to find out
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	Unknown
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	unsure
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	No
85137941	10/18/2020 21:28	West Gardiner	Not aware of any.
85414460	10/20/2020 13:54	Winthrop	

Response ID	Timestamp (mm/dd/yyyy)	Town	Q14.) Are there any improvements you feel are needed to better prepare your municipality for a disaster?
82697307	09/28/2020 07:55	Oakland (EC)	
82698476	09/28/2020 08:06		
82707867	09/28/2020 09:27	Gardiner	We need more day to day staffing
82714029	09/28/2020 10:33	Vassalboro	Red Cross Shelter at the School (FEMA Grant has been applied for - possible award pending.)
82721237	09/28/2020 11:07	Readfiled	Yes, always room for improvement
82756630	09/28/2020 14:53	Benton (EC)	no
82826934	09/29/2020 04:51	Monmouth	No
82847823	09/29/2020 08:07	China	
82942228	09/29/2020 17:26		
83183621	10/01/2020 12:58	Albion	no
83593417	10/05/2020 09:52	Benton	more information
83753155	10/06/2020 11:54		
83757692	10/06/2020 12:23		
84415295	10/12/2020 18:07	Oakland	
84475274	10/13/2020 08:31	Sidney (EC)	
84476119	10/13/2020 08:40	Waterville	Large scale command unit
84499847	10/13/2020 11:41		
84529536	10/13/2020 15:14		
84574582	10/13/2020 21:17	China	No
85137941	10/18/2020 21:28	West Gardiner	New Fire Truck
85414460	10/20/2020 13:54	Winthrop	