



FEMA

Ray Sisk, Director
Knox County EMA
62 Union Street
Rockland, Maine 04841

AUG 27 2019

Dear Director Sisk:

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region I Mitigation Division has approved the Knox County, Maine Hazard Mitigation Plan – 2019 Update effective **August 21, 2019** through **August 20, 2024** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the National Flood Insurance Act of 1968, as amended, and Title 44 Code of Federal Regulations (CFR) Part 201.

This plan approval includes the following participating jurisdictions that provided copies of their resolutions adopting the plan.

- | | | |
|-----------------------------|-------------------|------------------|
| • Appleton | • North Haven | • Union |
| • Camden | • Owls Head | • Knox County UT |
| • Cushing | • Rockland | • Vinalhaven |
| • Friendship | • Rockport | • Warren |
| • Hope | • St. George | • Washington |
| • Isle au Haut | • South Thomaston | |
| • Matinicus Isle Plantation | • Thomaston | |

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

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

Thank you for your continued commitment and dedication to risk reduction demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Melissa Surette at (617) 956-7559 or Melissa.Surette@fema.dhs.gov.

Ray Sisk
Page 2

Sincerely,

A handwritten signature in black ink, appearing to read "W. Russ Webster". The signature is fluid and cursive, with the first name "W. Russ" and last name "Webster" clearly distinguishable.

Captain W. Russ Webster, USCG (Ret.), CEM
Regional Administrator
FEMA Region I

WRW:ms

cc: Anne Fuchs, Maine State Hazard Mitigation Officer

Executive Summary

2019 Knox County Hazard Mitigation Plan Update

Background- PL 106-390, the *Disaster Mitigation Act of 2000* (DMA2000) was enacted as an amendment to the *Robert T. Stafford Disaster Relief and Emergency Assistance Act*. DMA2000 placed greater emphasis on the identification and assessment of risks from natural disasters. It also implemented a means by which federal funding could be provided to mitigate those risks while ensuring critical infrastructure of communities could continue to function after a natural disaster.

In 2013, FEMA approved the second revision of the Knox County Hazard Mitigation Plan which had been formally adopted by the county and its 17 towns and plantation. This current iteration of the Hazard Mitigation plan was *approved-pending adoption* by FEMA on (enter APA date for 2019 revision when available)

The purpose of the Knox County Hazard Mitigation Plan Update is to provide guidance for a hazard resistant Knox County that vigilantly assesses, plans for and mitigates any natural hazard. Particular emphasis is placed on those natural hazards which pose the greatest hazard to Knox County. Municipal hazard mitigation projects identified in this plan update by jurisdictions participating in the plan are eligible to apply for FEMA funding assistance under a variety of mitigation related programs.

This multi-jurisdictional plan has been prepared by a Hazard Mitigation Planning Team hosted by the Knox County EMA and Mr. Rich Rothe, of Rothe Associates, a contract Hazard Mitigation planner. Assistance and direct input was provided by representatives from state, county and municipal governments, private and volunteer sectors. The Planning Team met or spoke with representatives of each of the municipalities to collect comments and recommendations on identification of hazards, assessment of vulnerabilities and risks, and determination of mitigation goals and measures. Information for this plan was also collected from surveys sent to each municipality. The surveys asked about planning and development, critical infrastructure inventory, and a listing of reoccurring disaster damage areas. Several public meetings and presentations were held at the Knox County EMA office or other locations about the county.

This plan is generally revised every five years, however, the *Hazard Mitigation Projects by Municipality* table contained in Section 5 is considered a “living document”. Municipalities are encouraged to periodically revise projects listed and provide updates for their respective jurisdictions. The projects listed in this section are the starting points for competitive grant awards for Hazard Mitigation Projects.

The Knox County Hazard Mitigation Planning Team identified and rated natural hazards, described their occurrence, frequency and vulnerable areas. The top five hazards profiled are:

1. Severe Summer Storm Events (includes storms in the spring, coastal erosion/landslides associated with storms and Hurricanes)
2. Severe Winter Storm Events
3. Flooding
4. Wildfire
5. Landslide

Cost estimates of potential future damages based on previous declared and undeclared disaster events were calculated. Recovery and mitigation costs from those historical events were shown along with calculated estimates of costs in “today’s dollars”.

Goals and strategic activities for each of the hazards identified were followed by a summary of prioritized projects (listed by municipality) to mitigate these hazards. Strategies for hazard mitigation across the municipalities of the county were identified to improve the disaster resilience of the affected communities. As noted, projects included in the plan may be eligible for funding from FEMA and MEMA.

The Knox County EMA will convene a meeting of the Hazard Mitigation Planning Team in 2023 to formally review of the risk assessment portion of the plan to determine if this information should be updated or modified, and if additional hazards should be profiled in the next revision.

Selected citations from PL 106-390, “*The Disaster Mitigation Act of 2000*”

Title II 42 USC 5133

“Section 203. Predisaster Mitigation

(c) APPROVAL BY PRESIDENT.—If the President determines that a State or local government has identified natural disaster hazards in areas under its jurisdiction and has demonstrated the ability to form effective public-private natural disaster hazard mitigation partnerships, the President, using amounts in the National Predisaster Mitigation Fund established under subsection (i) (referred to in this section as the ‘Fund’), may provide technical and financial assistance to the State or local government to be used in accordance with subsection (e).

Title II 42 USC 5165

“SEC. 322. MITIGATION PLANNING.

(a) REQUIREMENT OF MITIGATION PLAN.—As a condition of receipt of an increased Federal share for hazard mitigation measures under subsection (e), a State, local, or tribal government shall develop and submit for approval to the President a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government.

(b) LOCAL AND TRIBAL PLANS.—Each mitigation plan developed by a local or tribal government shall—

- (1) describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and
- (2) establish a strategy to implement those actions.

KNOX COUNTY, MAINE HAZARD MITIGATION PLAN – 2019 UPDATE



Prepared By:

**Knox County, Maine
Emergency Management Agency**

2019 Update

KNOX COUNTY HAZARD MITIGATION PLAN – 2019 UPDATE

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SECTION 1 OVERVIEW

Purpose

The purpose of this plan update is to provide guidance for a hazard resistant Knox County that vigilantly assesses, plans for and mitigates any natural hazard.

Geography

The County has a total area of 1,142 square miles, of which, 366 square miles is land and 776 square miles (68%) is water. Thirteen of the County's municipalities, including five islands, are coastal communities with frontage on Penobscot Bay and the Atlantic Ocean. There is approximately 768 miles of ocean coastline. The mainland portion of the County includes 13 lakes and great ponds. Rolling hills and mountains rise in both coastal and inland communities to a maximum elevation of 1,385 feet.

Climate

Knox County's climate has an influence on the occurrence and severity of natural hazards. During the winters, temperatures range on average from 10 to 29°F. Ice, sleet, rain, snow, and heavy winds are common. The highest monthly precipitation is 5.37 inches on average in November. During the summers, temperatures are pleasant. The warmest month, July has an average daily maximum temperature of 76.2°F. However, storms are common and bring heavy winds and rain. The lowest monthly precipitation for the County is 2.91 inches on average in August.

Transportation

With the exception of school bus services and on-demand response services for special needs individuals, and limited public service bus routes, regularly scheduled, fixed-route municipal public transportation services are not provided within the County. Therefore, most are dependent on private vehicles and the road network. Additionally, island communities are served by state and private ferries and essential air services which can be severely impacted by extreme weather. US Route 1 is the principal arterial serving Knox County residents and businesses. It is an economic lifeline to the region. State Route 17 is a minor arterial, providing the main east-west inland access to the state capital Augusta. The other state routes are collector roads that link coastal, peninsular, and inland communities. The region has freight rail service only. Year-round passenger rail is not currently available but is expected to return with limited passenger service to Boston within the next five years. The Knox County Regional Airport provides scheduled commercial air service to Boston and beyond.

Governance

Knox County has the following governmental units:

- **County** - One county government that is run by a county commission/county administrator form of government. The county commission sets policy, adopts plans, and approves annual budgets for the county, and adopts ordinances as appropriate for townships of the unorganized territory. The County includes the County Sheriff's Office and County Jail, County Administrative Office, County Treasurer's Office, Registrar of Deeds, Probate Judge, District Attorney, Regional Communications Center, Regional Airport and the Emergency Management Office.

- **City** - One city that is run by a city council/city manager form of government. The city council sets policy, adopts plans and ordinances, and approves annual budgets. The city office has regular hours, and provides a range of public services, like sewer, water, police, ambulance, fire protection, and public works. The city is responsible for tax collection, local road maintenance and snow removal, land use planning and permitting and code enforcement. Most city officials are paid employees.
- **Town** - Sixteen towns that are run by publically elected select boards, some with town administrators or managers. The town meeting form of government is used, in which registered voters adopt ordinances and plans, and approve budgets at yearly and special town meetings. Town offices are open to the public on a limited basis, and most town officials are volunteers. Towns provide limited services, and most depend upon the County or neighboring communities to assist with police and fire protection. The towns are responsible for tax collection, local road maintenance and snow removal, land use planning and permitting and code enforcement.
- **Plantation** - One plantation that is run by a Board of Assessors. Few services are provided locally, and the plantation depends upon the State and the County to assist with police protection and other essential services. Plantation office hours are irregular.
- **UT (Unorganized Territory)** - The State regulates land use development and permitting through the Land Use Planning Commission (LUPC), and tax collection. The County provides police protection and other essential services. The Unorganized Territory has no local government.

Employment

Most employment is located in the service center community of Rockland, followed by the specialized service center communities of Camden, Rockport, and Thomaston. Medical, social services and education professions have seen growth over the past decade, while many other sectors have stagnated or decreased. Hospitality occupations provide low wage employment in season. Traditional industries including construction, maritime activities, and related occupations remain important sectors, although they employ fewer people today than they once did.

Demographics

County, State, Nation Profile						
Measure	Knox County		Maine		United States	
	2010	ACS 2017	2010	ACS 2017	2010	ACS 2017
Population	39,736	39,700	1,328,361	1,330,158	308,745,538	321,004,407
Total Housing Units	23,744	24,215	721,830	735,711	131,704,730	135,393,564
Total Households	17,258	17,022	557,219	554,061	116,716,292	118,825,921
Median Household Income	\$45,264	\$53,117	\$46,933	\$53,024	\$51,914	\$57,652
% of population under 5	4.8%	4.4%	5.2%	4.8%	6.5%	6.2%
% of population 18 and over	80.6%	81.7%	79.3%	80.7%	76.0%	77.1%
% of population 65 and over	19.1%	22.9%	15.9%	18.8%	13.0%	14.9%

Source: US Census 2010 and ACS 5-yr Estimates 2017

Municipal Profile						
	Population				Housing Units	
Area	2000	2010	2017 ACS Estimates	2010-2017 % Change	2010 Total	2010 Occupied
Appleton, Town of	1,271	1,316	1,358	3.2	646	545
Camden, Town of	5,254	4,850	4,837	-0.3	3,165	2,382
Cushing, Town of	1,322	1,534	1,475	-3.8	926	642
Friendship, Town of	1,204	1,152	1,035	-10.2	896	508
Hope, Town of	1,310	1,536	1,522	-9.1	805	603
Isle au Haut, Town of	79	73	27	-63.0	172	42
Matinicus Isle Plantation	51	74	81	9.5	147	41
North Haven, Town of	381	355	540	52.1	515	165
Owls Head, Town of	1,601	1,580	1,559	-1.3	1,060	737
Rockland, City of	7,609	7,297	7,204	-1.3	3,925	3,423
Rockport, Town of	3,209	3,330	3,356	0.8	1,956	1,422
St. George, Town of	2,580	2,591	2,583	-0.3	2,107	1,204
South Thomaston, Town of	1,416	1,558	1,453	-6.7	893	674
Thomaston, Town of	3,748	2,781	2,767	-0.5	1,385	1,219
Union, Town of	2,209	2,259	2,507	11.0	1,203	981
UT (Unorganized Territories)	0	7	8	14.3	91	3
Vinalhaven, Town of	1,235	1,165	1,168	0.3	1,295	545
Warren, Town of	3,794	4,751	4,706	-0.9	1,760	1,508
Washington, Town of	1,345	1,527	1,514	-0.9	797	614
Knox County	39,618	39,736	39,700	-0.9	23,744	17,258

Source: U.S. Census and American Community Survey 5-Year Estimates 2013-2017

SECTION 2 PLAN ADOPTION

Multi-Jurisdictional Plan Adoption	
Requirement §201.6(c)(5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.	
Elements	A. Does the new or updated plan indicate the specific jurisdictions represented in the plan?
	B. For each jurisdiction, has the local governing body adopted (the) new or updated plan?
	C. Is supporting documentation, such as a resolution, included for each participating jurisdiction?

The Knox County ME Hazard Mitigation Plan update is a multi-jurisdiction plan. The specific jurisdictions that participated in the review of and revisions to this plan update included all of the following communities:

- Appleton, Town of
- Camden, Town of
- Cushing, Town of
- Friendship, Town of
- Hope, Town of
- Isle au Haut, Town of
- Matinicus Isle Plantation
- North Haven, Town of
- Owls Head, Town of
- Rockland, City of
- Rockport, Town of
- St. George, Town of
- South Thomaston, Town of
- Thomaston, Town of
- Union, Town of
- UT (Unorganized Territory)
- Vinalhaven, Town of
- Warren, Town of
- Washington, Town of

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Appleton, acting on behalf of the Town of Appleton within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Appleton

John Farmer
Printed Name

[Signature]
Signature

Select Board Chair
Position

7/2/19
Date

PETER BECKETT
Printed Name

[Signature]
Signature

SELECT MAN.
Position

7/2/19
Date

Lore Costigan
Printed Name

[Signature]
Signature

select board
Position

July 2, 2019
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, Knox County, acting on behalf of the Unorganized Territory within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

County/City/Town/Plantation of Camden

Robert A. Falciani
Printed Name

RAF
Signature

Select Board
Position

7-23-19
Date

Jenna Lookner
Printed Name

JL
Signature

Select Board
Position

July 23, 2019
Date

Taylor Benzel
Printed Name

TB
Signature

Select Board
Position

7/23/19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk-assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, Cushing, acting on behalf of the Town of Cushing within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Cushing

Alton Grover
Printed Name

Alton Grover
Signature

Selectman
Position

7-8-19
Date

Daniel Staples
Printed Name

Daniel Staples
Signature

Selectman
Position

7-8-19
Date

Martha Marchant
Printed Name

Martha Marchant
Signature

Selectman
Position

7/8/19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, Cushing, acting on behalf of the Town of Cushing within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Cushing

Corey Jones
Printed Name

[Signature]
Signature

Selectman
Position

7-8-19
Date

Laurie A. Haynes
Printed Name

[Signature]
Signature

Selectman
Position

7-8-19
Date

Printed Name

Signature

Position

Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Friendship, acting on behalf of the Town of Friendship within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Friendship

ARTHUR "Bubba" Thompson
Printed Name

Arthur "Bubba" Thompson
Signature

SELECTMAN
Position

7-9-19
Date

ELIZABETH DINSMORE
Printed Name

Elizabeth M. Dinsmore
Signature

Selectman
Position

7-9-19
Date

David E. Benner
Printed Name

David E. Benner
Signature

Selectman
Position

7-9-19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Hope, acting on behalf of the Town of Hope within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Hope

Brian S. Powers Jr
Printed Name

B S Powers Jr
Signature

Selectboard Chair
Position

7/23/19
Date

Sarah Ann Smith
Printed Name

SASmith
Signature

Select Board Vice Chair
Position

23 July 2019
Date

Thomas Ingraham
Printed Name

T A Ingraham
Signature

Select Bd Member
Position

23 July 2019
Date

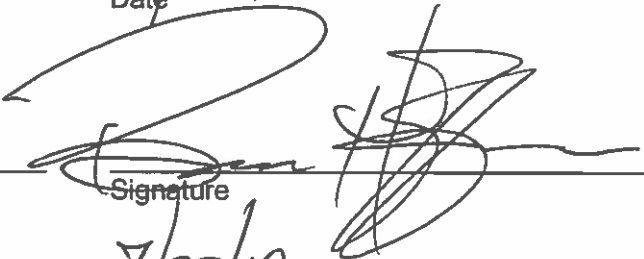
Wendy Pelletier
Printed Name

Wendy Pelletier
Signature

Selectman
Position

7/23/19
Date

BRUCE HOFFNER
Printed Name


Signature

SELECTMAN
Position

7/23/19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Isle au Haut, acting on behalf of the Town of Isle au Haut within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Isle au Haut

Peggi R. Stevens
Printed Name

Peggi R. Stevens
Signature

1st Selectperson
Position

7/16/19
Date

DANIEL MAC DONALD
Printed Name

Daniel MacDonald
Signature

2ND SELECTPERSON
Position

07/16/2019
Date

Abigail Schrader Hiltz
Printed Name

Abigail S. Hiltz
Signature

3rd Selectperson
Position

7/16/19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, Matinicus Isle Plantation, acting on behalf of the Matinicus Isle Plantation within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Matinicus Isle Plantation


Clayton Philbrook
Printed Name


Signature

1st Assessor
Position

7-9-19
Date

Tyler Bemis
Printed Name


Signature

Assessor
Position

7/9/2019
Date

Printed Name

Signature

Position

Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

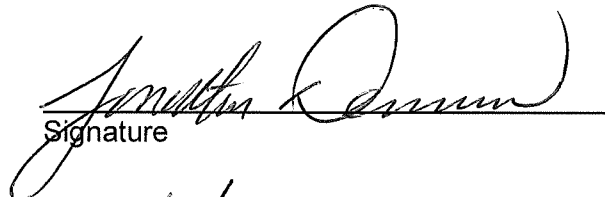
Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of North Haven, acting on behalf of the Town of North Haven within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of North Haven

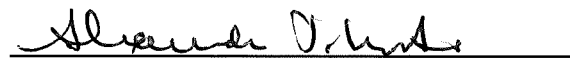
Jonathan Demmons
Printed Name


Signature

Chair Selectboard
Position

7/3/19
Date


Alexander Curtis
Printed Name


Signature

Selectman
Position

7/3/19
Date

JEREMIAH MACDONALD
Printed Name


Signature

SELECTMAN
Position

7/3/19
Date

Patricia J Lannon
Printed Name

Patricia Lannon
Signature

Selectman
Position

7/3/2019
Date

Printed Name

Signature

Position

Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Owls Head, acting on behalf of the Town of Owls Head within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Owls Head

THOMAS R. VON MALDER
Printed Name

Thomas R. Von Malder
Signature

Head of Selectman
Position

7-30-19
Date

Linda Post
Printed Name

Linda Post
Signature

Selectman
Position

7/19/19
Date

GORDON PAGE
Printed Name

[Signature]
Signature

SELECTMAN
Position

7/24/19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

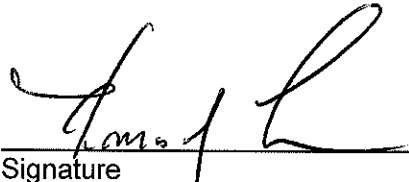
Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the City of Rockland, acting on behalf of the City of Rockland within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

City of Rockland

Thomas Lottrell
Printed Name


Signature

CITY MANAGER
Position

7/16/19
Date

Printed Name

Signature

Position

Date

Printed Name

Signature

Position

Date

CITY OF ROCKLAND, MAINE

RESOLVE #28

IN CITY COUNCIL

July 8, 2019

RESOLVE Adopting Knox County Hazard Mitigation Plan

WHEREAS, natural and man-made disasters may occur at any time, we recognize that to lessen the impact of these disasters we will save resources, property and lives in Knox County; and

WHEREAS, the creation of a multi-jurisdictional hazard mitigation plan is necessary for the development of a risk assessment and effective mitigation strategy; and

WHEREAS, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's unorganized territory are committed to mitigation goals and measures as presented in the Knox County Hazard Mitigation Plan;

NOW THEREFORE, BE IT HEREBY RESOLVED BY THE CITY COUNCIL AS FOLLOWS:

THAT the City of Rockland hereby adopted the Knox County Hazard Mitigation Plan as updated 2019.

Sponsor: Councilor Magjik

Originator: Fire Chief/EMA Director

*passed 7/8/19
S.O*

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Rockport, acting on behalf of the Town of Rockport within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Rockport

Debra Hall

Signature

Debra J. Hall

Chair, Select Board

Date

7-8-19

Denise Kennedy-Munger

Signature

Denise Kennedy-Munger

Vice-Chair, Select Board

Date

7-8-19

Douglas Cole

Signature

Douglas Cole

Select Board

Date

7/13/19

Mark Kelley

Signature *Mark G. Kelley*

Select Board

Date *8/July/2019*

Jeffrey Hamilton

Signature *J. Hamilton*

Select Board

Date *8-JUL-19*

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, South Thomaston, acting on behalf of the Town of South Thomaston within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of South Thomaston

Cheryl Waterman
Printed Name

Cheryl Waterman
Signature

Selectman
Position

9 July 2019
Date

WALTER L RUTZ
Printed Name

Walter L Rutz
Signature

SELECTMAN
Position

7/9/19
Date

JAN GAUDIO
Printed Name

J. C. Gaudio
Signature

SELECTMAN
Position

7/9/19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of St. George, acting on behalf of the Town of St. George within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

GERALD HALL

AUTHORIZING SIGNATURES

Gerald Hall

SELECT BOARD MEMBER

Town of St. George

7/8/19

Randall Elwell, Select Board

7/8/19

Tammy L. Willey

Printed Name

Tammy L. Willey

Signature

Select Board

Position

July 8, 19

Date

Wayne Sawyer

Printed Name

Wayne Sawyer

Signature

SO

Position

7/8/19

Date

Richard J.S. Bates

Printed Name

Richard J.S. Bates

Signature

Select Board

Position

7/8/19

Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Thomaston, acting on behalf of the Town of Thomaston within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Thomaston

PETER LAMMERT
Printed Name

Peter Lammert
Signature

CHAIR THOMASTON SELECTBOARD
Position

July 5 2019
Date

WILLIAM STAHN
Printed Name

[Signature]
Signature

SELECTED PERSON
Position

7/8/19
Date

Lee-Ann UPHAM
Printed Name

7/8/19
Signature

Lee-Ann M. Upham
Position

7/8/19
Date

Sandra Moore
Printed Name

[Signature]
Signature

Select Board
Position

7-8-15
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, Knox County, acting on behalf of the Unorganized Territory within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Union

GREGORY S. GROTTO
Printed Name

[Signature]
Signature

CHAIR Select Bd
Position

7-2-19
Date

John Shepard
Printed Name

[Signature]
Signature

selectman
Position

7/2/19
Date

Sarah J. Dickey
Printed Name

[Signature]
Signature

Selectman
Position

7/2/19
Date

Adam Fuller
Selectman
Knox County ME Hazard Mitigation Plan - 2019 Update

[Signature]
7/2/19

JOSHUA WHITE
SELECTMAN

[Signature]
7/2/19

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of city, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

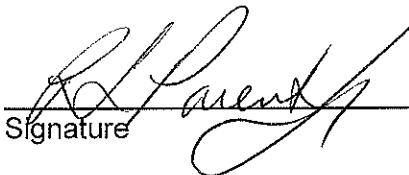
Therefore, the Knox County Commission hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, Knox County Commissioners, acting on behalf of the Unorganized Territory within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Unorganized Territory

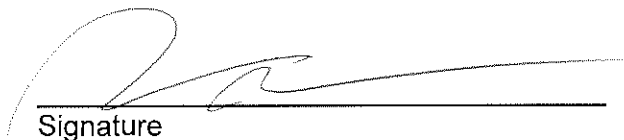
Richard L. Parent Jr.
Printed Name


Signature

Commissioner Clark
Position

7/9/2019
Date

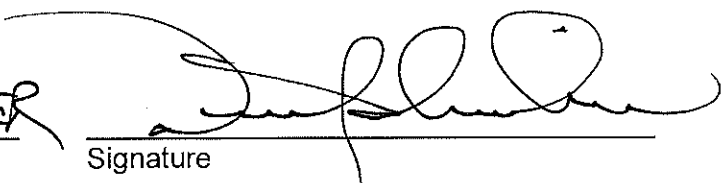
Shana L. Fohlman
Printed Name


Signature

Commissioner District 3
Position

7/9/2019
Date

DOROTHY G. MERRIFIELD
Printed Name


Signature

Comm. on R. District #1
Position

7/9/2019
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Vinalhaven, acting on behalf of the Town of Vinalhaven within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Vinalhaven

Eric W. Gasperini
Printed Name

Eric W. Gasperini
Signature

Selectman
Position

7/2/19
Date

PAMELA C. ALLEY
Printed Name

Pamela C. Alley
Signature

Position

4/8/19
Date

Ata Jacob Thompson
Printed Name

Ata Jacob Thompson
Signature

Selectman
Position

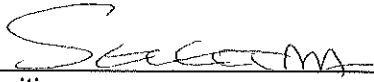
7/16/19
Date



Printed Name



Signature



Position

Date

Printed Name

Signature

Position

Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Warren Select Board, acting on behalf of the Town of Warren hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Warren

Roger Peabody
Printed Name

Roger Peabody
Signature

Chairman Board of Selectmen
Position

7/3/2019
Date

Wayne Luce
Printed Name

Wayne Luce
Signature

Selectman
Position

7/3/19
Date

Jan Macdonald
Printed Name

Jan Macdonald
Signature

selectman
Position

7-3-19
Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

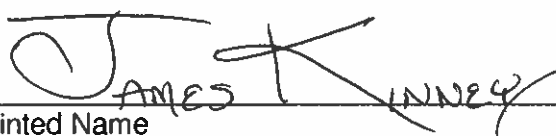
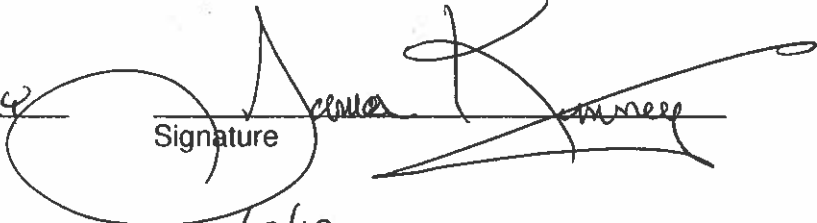
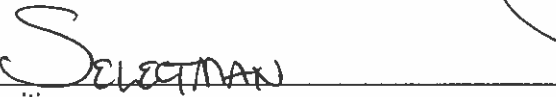
And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;




Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Warren Select Board, acting on behalf of the Town of Warren hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Warren

 Printed Name	 Signature
 Position	<u>7/3/19</u> Date

 Printed Name	 Signature
 Position	<u>7-3-19</u> Date

Printed Name

Signature

Position

Date

RESOLUTION

Whereas, natural and man-made disasters may occur at any time, we recognize that to lessen the impacts of these disasters we will save resources, property and lives in Knox County;

And whereas the creation of a Multi-Jurisdictional Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy;

And whereas, this multi-jurisdictional county of cities, towns, plantations and a portion of Maine's Unorganized Territory are committed to the mitigation goals and measures as presented in this plan;

Therefore, the City Councils, Boards of Selectmen of the Incorporated Towns and Board of Assessors for the Plantation, hereby adopt the Knox County Hazard Mitigation Plan - 2019 Update; and

Therefore, the Town of Washington, acting on behalf of the Town of Washington within its boundaries hereby adopts the Knox County Hazard Mitigation Plan - 2019 Update.

AUTHORIZING SIGNATURES

Town of Washington

Thomas N Johnston
Printed Name

[Signature]
Signature

Selectman
Position

7/3/19
Date

Berkley Linscott
Printed Name

[Signature]
Signature

Selectman
Position

7/3/19
Date

Printed Name

Signature

Position

Date

SECTION 3 PLANNING PROCESS

Planning Process	
Requirement §201.6(c)(1): (The Plan shall include) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.	
Element	A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))
	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? (Requirement §201.6(b)(2))
	A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))
	A4. Does the plan describe the review and incorporation of existing plans, studies, reports and technical information? (Requirement §201.6(b)(3))
	A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))
	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)? (Requirement §201.6(c)(4)(i))

A1. Documentation of Planning Process

This Knox County Hazard Mitigation Plan Update is a multi-jurisdictional plan that has been prepared by a Hazard Mitigation Planning Team hosted by the Knox County Emergency Management Agency with representatives from the state, county and municipal governments, private and volunteer sectors. The Planning Team also met or spoke with representatives of each of the 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.

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

Participants at various meetings discussed county wide and municipal specific hazards and the probability and vulnerability of certain hazards. Groups also reviewed mitigation projects from the 2012 plan, new projects that have been added for the 2019 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.

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

Knox County Planning Team	
Ray Sisk	Director, Knox County Emergency Management Agency
Leticia vanVuuren	GIS Planner, Certified HAZUS Practitioner, Knox County EMA
Candice Richards	M-HSEM, EMA Admin Assistant, Knox County EMA
Don Grinnell	Resources and Operations Planner, Knox County EMA
Anne Fuchs	Maine Emergency Management Agency (MEMA)
Jamie Francomano	MidCoast Regional Planning Commission
Rich Rothe	Rothe Associates

Documentation of local participation. Participation is documented by attendance lists of meetings, press releases, meeting notices, websites, and municipal survey responses in Appendix B, E and F. Each community's participation is characterized and summarized in the following table.

Summary of Local Participation					
Area	Meeting Attendance	Telephone Conversations	Email Correspondence	Surveys and Mailings	Representative(s) (KEY below)
Appleton, Town of	x		x	x	ELOFF, LEMD, TO, PW
Camden, Town of	x		x	x	TM, ELOFF, LEMD, TO, PU, PW
Cushing, Town of	x		x	x	ELOFF, LEMD, TO
Friendship, Town of	x		x	x	ELOFF, LEMD
Hope, Town of	x	x	x	x	TM, ELOFF, LEMD
Isle au Haut, Town of		x	x	x	ELOFF, LEMD
Matinicus Isle Plantation	x	x	x	x	ELOFF, LEMD, PU
North Haven, Town of	x	x	x	x	TM, LEMD, TO
Owls Head, Town of	x		x	x	ELOFF, LEMD
Rockland, City of	x		x	x	TM, ELOFF, LEMD, TO, PU, PW
Rockport, Town of	x	x	x	x	TM, ELOFF, LEMD, TO, PW
St. George, Town of	x	x	x	x	TM, ELOFF, LEMD, TO, PW
South Thomaston, Town of		x	x	x	TM, ELOFF, LEMD
Thomaston, Town of	x	x	x	x	TM, ELOFF, LEMD, TO, PW
Union, Town of	x		x	x	TM, LEMD, PW
UT (Criehaven, Muscle Ridge Shoals)		x	x	x	CCOM
Vinalhaven, Town of	x	x	x	x	TM, ELOFF, LEMD, PU, TO
Warren, Town of	x		x	x	TM, LEMD, TO, PW, PU
Washington, Town of	x		x	x	ELOFF, LEMD, TO

Key

TM Town/City Manager/Administrator
ELOFF Municipal Elected Official
PW Public Works or Road Commissioner
LEMD Local Emergency Manager

PU Public Utility
RES Private Citizen
CCOM County Commission
TO Town Official/Employee

Status of local participation.

Summary of Participating Municipalities			
Areas	In 2005 Plan	In 2012 Plan	In 2019 Plan
Appleton, Town of	Yes	Yes	Yes
Camden, Town of	Yes	Yes	Yes
Cushing, Town of	Yes	Yes	Yes
Friendship, Town of	Yes	Yes	Yes
Hope, Town of	Yes	Yes	Yes
Isle au Haut, Town of	Yes	Yes	Yes
Matinicus Isle Plantation	Yes	Yes	Yes
North Haven, Town of	Yes	Yes	Yes
Owls Head, Town of	Yes	Yes	Yes
Rockland, City of	Yes	Yes	Yes
Rockport, Town of	Yes	Yes	Yes
St. George, Town of	Yes	Yes	Yes
South Thomaston, Town of	Yes	Yes	Yes
Thomaston, Town of	Yes	Yes	Yes
Union, Town of	Yes	Yes	Yes
UT (Criehaven & Muscle Ridge Shoals)	No	Yes	Yes
Vinalhaven, Town of	Yes	Yes	Yes
Warren, Town of	Yes	Yes	Yes
Washington, Town of	Yes	Yes	Yes

Narrative description.

The planning process included a series of meetings for local officials and mailings to all municipalities in the county. The Hazard Mitigation Planning Team meetings are described in the paragraphs below and additional meeting information is in Appendix E:

Kick Off Meeting, December 13, 2016. The following is a summary of the planning “Kick off” meeting held at the Knox County EMA Office to begin development of the 2019 update to the Knox County Hazard Mitigation Plan.

35 Municipal officials and interested citizens representing 14 of 18 Knox County municipalities, Knox County EMA, Maine Emergency Management Agency, the MidCoast Regional Planning Commission, a public wastewater and rural electrical cooperative utility were represented at the meeting (see *Summary of Local Participation Table*). Planning stakeholders were identified and plan relevance to mitigation strategies, projects and funding were discussed.

Plan revision public outreach including website, media and social media information was discussed. An invitation for planning participation and public comment has been placed on the EMA website.

The existing 2012 (approved 2013) plan was briefly reviewed and points expected to carry over into the revision were identified. The group felt much of the information in the existing plan should remain in the revision.

The Municipal Mitigation Survey was introduced and distributed. 18 of 18 jurisdictions in the county returned completed surveys. Municipalities were asked to review and provide status on existing municipal mitigation strategies and projects contained in Section 5, consider new projects aligned with municipal goals, and return updated info prior to the fall of 2017. There

was some agreement that improved transportation infrastructure documentation presented a single most valuable effort to pursue.

Planning milestones and future planning participation expectations were discussed. Public outreach strategies were outlined and information on mitigation-related training and workshop initiatives were presented.

A follow-on workshop was planned for February 8, 2017.

A sampling of additional planning or plan related meetings is listed below:

Managing Local Roads with RSMS and GIS Workshop, February 8, 2017. The focus of this workshop was the MaineDOT Local Road's Center Road Management Software, or RSMS, a low cost, easy to use GIS enabled/compatible software to maintain, manage, and assess municipal roads. The workshop introduced attendees to RSMS functions, utilities and applications, and how it can be incorporated into municipal /EMA GIS and planning.

Using RSMS for Local Road Management Workshop/Lab, April 13, 2017. This was a follow-up workshop to the one held on February 8. This was a practical lab that provided attendees with a hands-on opportunity to learn and work with RSMS software.

Putting RSMS to Use for Local Road Management, December 5, 2017. This workshop/case study demonstrated how two local communities, Rockport and Union, inventories their roads, culverts and poles to better control their budgets.

Additional RSMS for Local Road Management meetings/workshops. These were held on February 13, 2018, March 19, 2018, and June 13, 2018. More information on these meetings can be found in Appendix E.

Language of GIS. These workshops covered the many uses of GIS data for municipalities, including hazard mitigation. Workshops were held on December 4, 2018, December 11, 2018, January 29, 2018.

Community Rating System Workshop. These workshops were conducted by the NOAA Coastal Management Fellow Maine Coastal Program and gave an overview of the Community Rating System and the National Flood Insurance Program. The workshops were held on June 15, 2017 and July 6, 2017.

Local Emergency Management Directors Meetings 2017 – 2019. Nine formal meetings are scheduled for each year. At nearly every one during the 2017 – 2019 timeframe, updates were given on the Hazard Mitigation Plan update process. Hazard mitigation maps were developed for each municipality with local EMA director input and review. Local EMA director were asked to provide periodic briefings to their municipal officials, were asked for feedback, input, and updates continually made to the plan after each meeting. A telepresence option was enabled for each meeting as a convenience for those unable to attend in person. More information on these meetings can be found in Appendix E.

Hurricane Vulnerability Study / Hazard Mitigation Planning. A conference call meeting with County-level EMA Directors, various members of the Maine Emergency Management Agency, other agencies, and the firm conducting the study was held on February 22, 2019. A follow-up meeting was held on March 1, 2019 with one MEMA representative, Knox County Hazard Mitigation Planners, and one Waldo County representative.

Public Comment and Review Session. On April 11, 2019, Knox County EMA sent an email to municipal representatives and local EMAs advising them that public comments and review sessions would be held on April 25, 2019 and that the review and comment period would close at 4:00 p.m. on May 5, 2019. (*This info was also presented at the Local EMD meeting held on Thursday, April 18, 2019.*) The email stated that this would be the final opportunity to review the updated Hazard Mitigation Plan prior to the plan being submitted to FEMA for conditional approval. The email stated that the updated plan is posted online at the Knox County EMA website.

Options for participating in the public comment and review session were set forth in the email (as well as a published newspaper notice) included:

1. Email. Anyone wishing to comment on the plan could email Knox County EMA between the date of the email April 11, 2019 and the close of the comment period (4:00 p.m., May 5, 2019).
2. Conference call. Anyone wishing to participate in a conference call on April 25, 2019 from 2:00 p.m. to 3:30 p.m. at which time comments could be made on the plan.
3. Meeting. Anyone wishing to comment on the plan could attend a public comment and review session at the Knox County EMA office on April 25, 2019 from 2:00 p.m. to 3:00 p.m.

People who were involved in the planning process.

Staff level and consultant assistance: The EMA Director led the development of the plan at the staff level. The Director was assisted by consultant Mid-Coast Regional Planning Commission and Rich Rothe of Rothe Associates in the drafting of the plan update.

Each municipality participated in one of several ways. Information for this plan was collected from data surveys that were sent out to each municipality. All municipalities completed and returned surveys, which included Planning and Development Information, Critical Infrastructure Inventory, a listing of reoccurring disaster damage areas and other areas of concern. Finally, every community participated in the Mitigation Project Selection Process by attending several public meetings held at the County EMA office after the Hazard Mitigation Planning Team completed their work.

See Appendix E for a summary of meetings, trainings, etc.

Organizations and agencies. The following organizations and agencies participated in the development and review of the Knox County Hazard Mitigation Plan:

- Knox County Commission
- Knox County Emergency Management Agency
- Knox County Local Emergency Planning Committee (includes representation from the American Red Cross, Maine Department of Environmental Protection, U.S. Coast Guard, Penobscot Bay Medical Center, DuPont Nutrition USA, Dragon Products and Coastal Cement Corporation, Fisher Engineering, Lonza, Inc., Lyman Morse Boatbuilding Company, Maritime Energy, O'Hara Corporation, and Northeast Composites, Inc.)
- Knox Regional Communication Center
- Mid-Coast Regional Planning Commission

A2. Opportunity for neighboring communities, local and regional agencies

Since this is a multi-jurisdictional plan, all meetings were with neighboring communities, either adjacent to each other or within the County. 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 information in the form of municipal mailings, the Knox County EMA website, emails and phone calls. Many of the local officials involved in the 2019 update of the plan work in various agencies, businesses, academia and nonprofit organizations.

A3. How the public was given an opportunity to be heard.

The Planning Team used press releases, municipal mailing, the County EMA website and social media to provide public notice. Public notice was also given for all of the team meetings and public informational meetings, in which public comment was accepted, in the form of newspaper notices. Meeting notices, press releases, and websites links are included in Appendix F.

Additional comments could be made to the County EMA in person, by phoning or writing by mail, email, and/or by completing the survey provided to the municipalities. Opportunities for neighboring jurisdictions, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process were given in the form of press releases, municipal mailings, the County EMA website, social media and newspaper notices used to meet the requirements of A3, above. No formal public input was provided outside of meetings and the municipal surveys, however anecdotal info from private citizens was considered in plan development.

A4. Review and incorporation of existing plans and studies.

The Planning Team reviewed the 2013 County Plan, the 2019 version of the State Plan and other county and local plans and incorporated them as appropriate. The Risk Assessment portion of this plan provides a more detailed summary of plans, and other materials that were used to identify and document various hazards. This plan update may be incorporated into other plans, municipal budgets, and EOPs once this plan update is approved by FEMA and adopted by the municipalities of Knox County.

A5. How communities will continue public participation.

See Section 6 Plan Maintenance Process.

A6. Method and schedule for keeping plan current.

See Section 6 Plan Maintenance Process.

SECTION 4 RISK ASSESSMENT

Risk Assessment	
Requirement: §201.6(c)(2): (The plan shall 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.	
Element	B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))
	B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))
	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? (Requirement §201.6(c)(2)(ii))
	B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

44 CFR §201.6(c)(2) outlines specific information that Knox County must consider when completing the risk assessment portion of this mitigation plan. The 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, those risks with potential to impact only portions of the County were assessed separately in the context of the plan.

Physical Geography

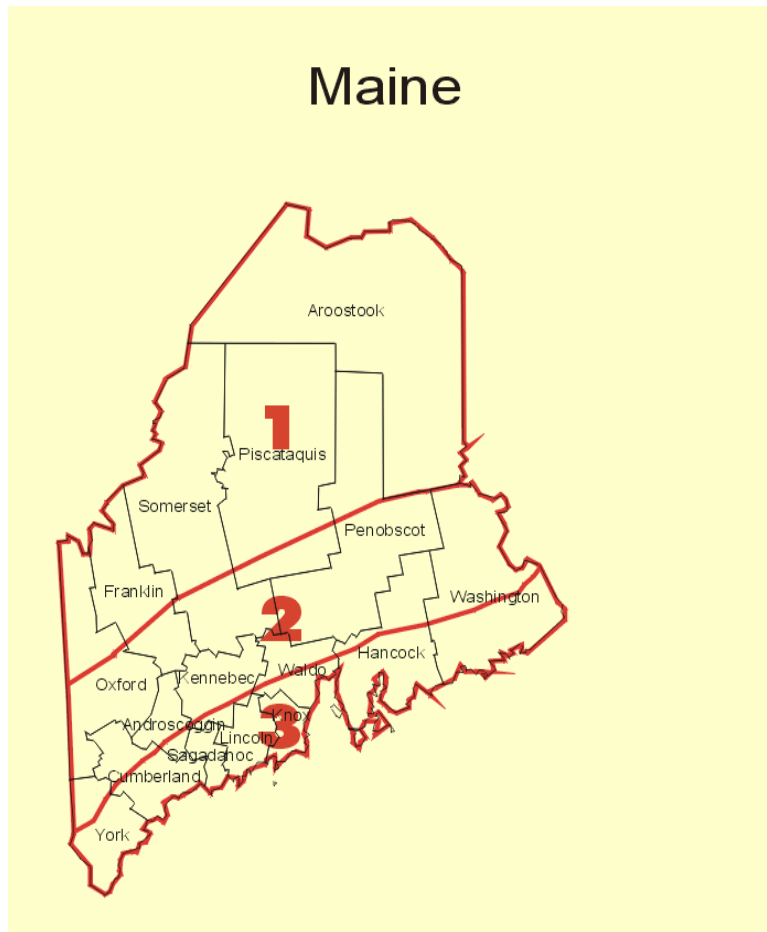
According to the Maine State Hazard Mitigation Plan - 2018, prepared by the Maine Emergency Management Agency, "The present-day landscape is a direct result of glacial erosion and deposition from the large ice sheets that completely covered Maine approximately 14,000 years ago. A variety of glacial deposits cover the state, 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."

"Maine is a water rich state with five major rivers and 5,779 lakes and ponds. Water accounts for 13.5 percent of Maine's land cover. Much of Maine is under coastal influence, as the easternmost state in the United States. The State's tidally influenced coastline stretches 3,478 miles and is characterized by its rugged shape, numerous islands, peninsulas, bays and inlets."

Climate

Knox County is located in the Coastal Division of Maine's three climatic divisions. The Coastal Division encompasses a 20-30 mile band along the coast of 4,992 square miles (15%) of the State.

This division is most affected by the ocean, but has minimal elevation change, and thus, minimal climatic impact from any topographic controls.



Climate Divisions of Maine

Temperature: According to the Maine State Hazard Mitigation Plan - 2018, “The mean annual temperature varies greatly across the State of Maine. The mean annual temperature in the coastal region is 43.8 degrees F...July is the warmest month in Maine, with a statewide mean temperature of 65.4 degrees F. Conversely, January is the coldest month on average, with a statewide mean temperature of 13.5 degrees F.”

Precipitation: The Maine State Hazard Mitigation Plan - 2018 states that “Maine averages 42.6 inches of precipitation annually statewide, based on precipitation data collected between 1895 and 2016...On average, the coastal division receives the most annual precipitation, at 46.1 inches...Average monthly precipitation statewide ranges from a low of 2.6 inches in February to a high of 4.0 inches in November.”

Prevailing Winds: The Maine State Hazard Mitigation Plan - 2018 states that “Prevailing wind direction varies across the state 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 state 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 across the state.”

Climate Change

The purpose of this part of the plan is 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 Knox County. Projecting future climate change can be problematic because, as stated in the document “Maine’s Climate Future, 2015 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).

As stated in the Maine State Hazard Mitigation Plan - 2018, “For clarification, the National Aeronautics and Space Administration (NASA) uses the following definitions to describe climate and weather:

Climate: The description of the long-term pattern of weather in a particular area.

Weather: The description of the way the atmosphere is behaving in the short term, from minute to minute, hour to hour, day to day, and season to season.”

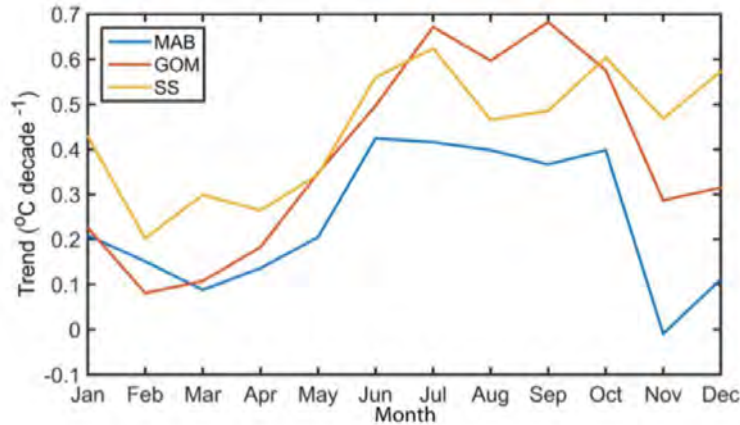
Temperature Changes: Excerpts from the report “Maine’s Climate Future, 2015 Update,” prepared by the University of Maine, include the following:

“Average annual temperature across Maine warmed by about 3.0 degrees F between 1895 and 2014....Although the overall warming trend...is clear, Maine’s temperature signal also features significant year to year fluctuations superimposed on a distinct pattern with periods of relative cold...and warmth...” (page 2).

“Numerical models of the global atmosphere and ocean have been in development for over three decades. The most sophisticated of these models, such as those used by the Intergovernmental Panel on Climate Change (IPCC)...predict that annual temperature will increase another 3.0 – 5.0 degrees F...across Maine between now and 2050” (page 3).

“Maine’s warm season...increased by two weeks from the early 1900s to the 2000s. Global climate models predict that the warm season will increase by an additional two weeks over the next 50 years. Winter is warming at a faster rate than summer.” (page 3).

Surface Seawater Temperature Change: A study completed by Andrew Thomas and the U Maine School of Marine Sciences examined 33 years of sea surface temperatures (SST) data along the NE United States Continental Shelf and found the Gulf of Maine SST to be increasing at a rate of about .4° C/decade. The study postulates “*A warmer shelf means that hurricanes approaching in the late fall are going to be impacting warmer water. We know cold water slows down hurricanes and so hurricanes coming ashore will come ashore more powerful than the same sort of hurricane 20 or 30 years ago*”. (cite: Thomas, A.C., Pershing, A.J., Friedland, K.D., Nye, J.A., Mills, K.E., Alexander, M.A., Record, N.R., Weatherbee, R. and Henderson, M.E., 2017. Seasonal trends and phenology shifts in sea surface temperature on the North American northeastern continental shelf. *Elem Sci Anth*, 5, p.48. DOI: <http://doi.org/10.1525/elementa.240>)



Temperature trends (in degrees Celsius per decade) for the recent 33-year period (1982–2014) in each month, averaged over the surface waters of the Mid-Atlantic (MAB), Gulf of Maine (GOM) and Scotian Shelf (SS). While all months show increasing temperature trends, these data show the large seasonal difference in when, during the year, the largest changes are taking place. (<https://umaine.edu/news/blog/2017/09/05/longer-stronger-summer-gulf-maine/>)

Precipitation Changes: Excerpts from the report “Maine’s Climate Future, 2015 Update,” include the following:

“Since 1895, total annual precipitation has increased by about six inches...or 13%, with most of the additional amount falling in summer and fall. IPCC models predict that precipitation will continue to increase across the Northeast by 5-10% between now and 2050, although the distribution is likely to vary across the climate zones. Model predictions show greater increases in precipitation in interior Maine...whereas measurements to date from the weather stations across the Maine landscape show that precipitation has increased most along the coast” (page 8).

“A significant increase in extreme precipitation events (more frequent and intense storms) has been observed across Maine and other parts of the eastern U.S....we define an extreme precipitation event for this analysis as one in which two or more inches (five or more cm) of precipitation falls within a 24-hour period. Historical measurements show that extreme events vary across the state, occurring most often in the coastal zone and western mountains. The northernmost sites, like Millinocket and Caribou, show fewer extreme events overall, but with similar relative increases over the most recent decade” (page 9).

“In general, the snow season has declined on average across Maine since the late 1800s...On a simplified linear trend, the snowfall has declined by about 15%...although the amount and duration of snow may decline in the future, extreme snowfall events with significant accumulation - strong nor’easters - are likely to increase in frequency” (page 10).

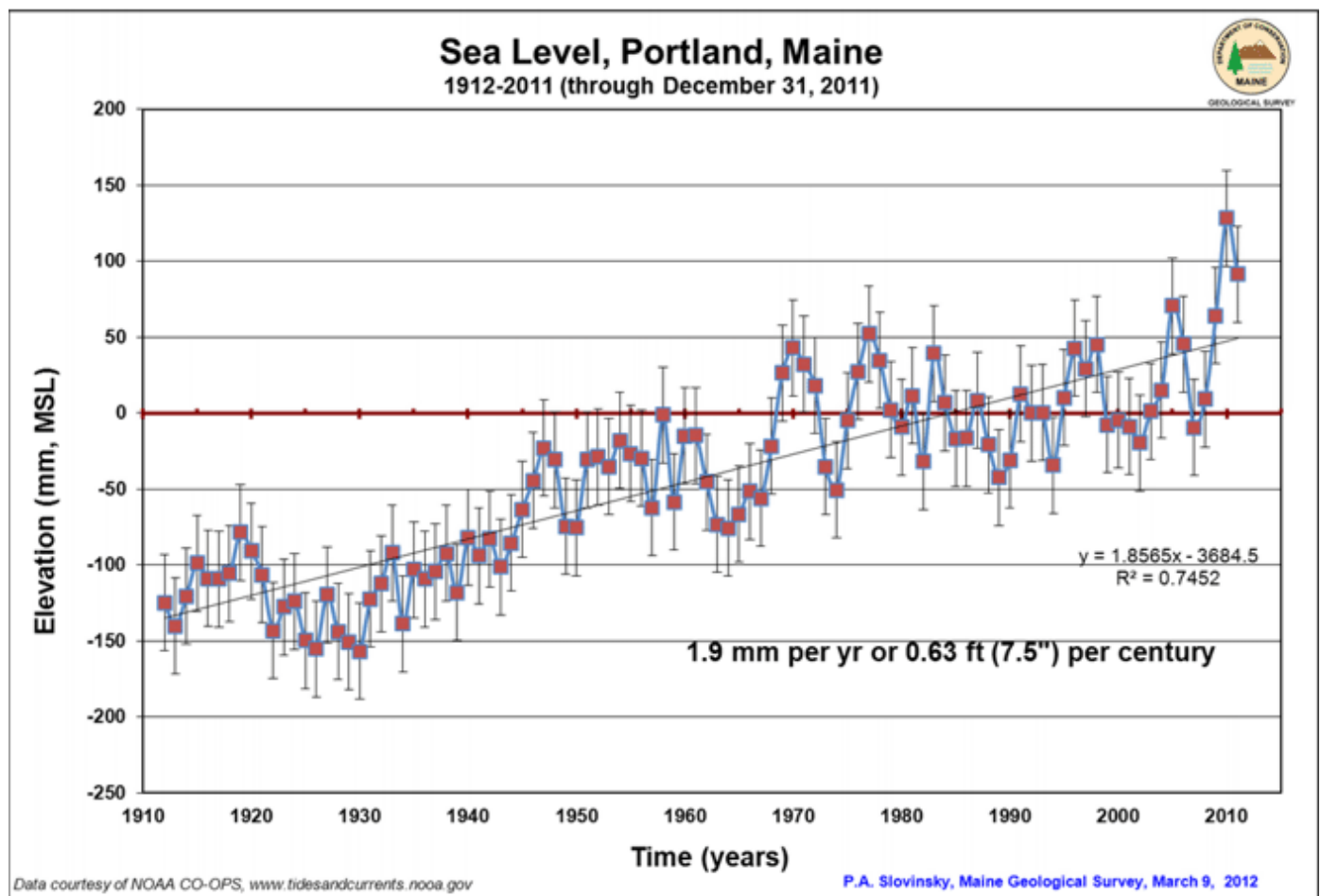
“The Northeast has experienced a greater recent increase in extreme precipitation than any other region in the U.S.; between 1958 and 2010, the Northeast saw more than a 70% increase in the amount of precipitation falling in very heavy events, taxing an already stressed and aging infrastructure” (page 11).

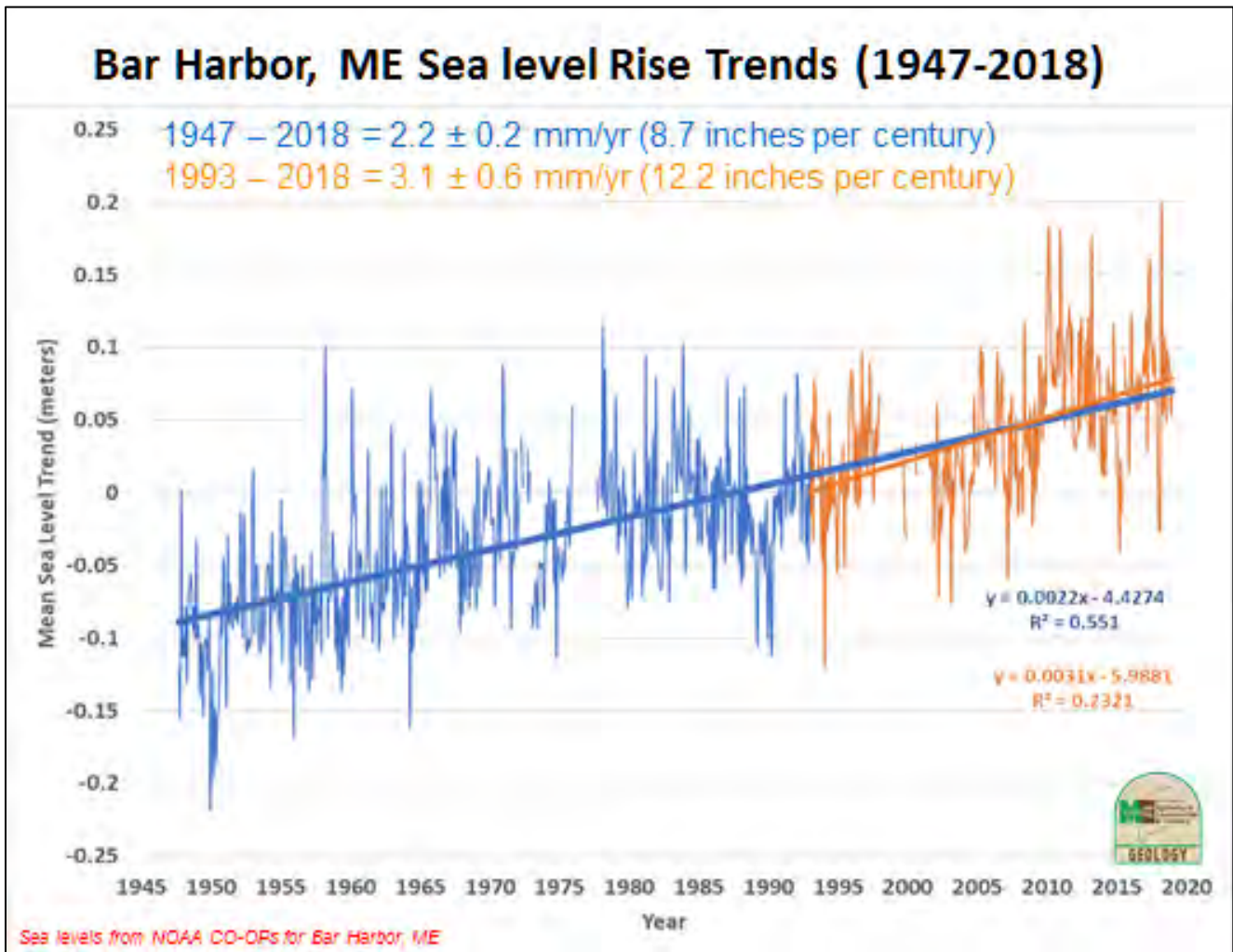
Sea Level Rise. According to the Maine State Hazard Mitigation Plan - 2018, “Global sea level is rising at a rate of 0.07 inches per year (1.9mm), though that rate varies significantly for a specific location based on topography, ocean circulation, and geologic variations. The table below demonstrates documented sea level changes over various time periods based on available data across several locations in Maine, from south to north:

Documented Sea Level Rise across Maine			
Location	Time Period	Total Change (100 year equivalent)	Average Annual Change
Seavey Island, Maine	1926-2001	0.58 feet	1.76 mm
Portland, Maine	1912-2016	0.61 feet	1.86 mm
Bar Harbor, Maine	1947-2016	0.72 feet	2.2 mm
Cutler, Maine	1979-2010	0.77 feet	2.34 mm
Eastport, Maine	1929-2016	0.70 feet	2.12 mm

Source: <https://tidesandcurrents.noaa.gov/sltrends/sltrends.html>”

The graphs below, prepared by the Maine Geological Survey, shows sea level rise over time through 2011 in Portland and 2018 in Bar Harbor.





One of the consequences of sea level rise is the damage that can occur from storm surges. Storm surge is simply water that is pushed toward the shore by the force of the winds swirling around the storm as well as low barometric pressure. This advancing surge combines with the normal tides to create the storm tide. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides. The following illustration shows how storm surge can increase flooding risk.



No one knows for sure how high the sea will rise or how quickly it will occur, but the IPCC has prepared a range of scenarios based on a scientific analysis of a number of variables including glacial ice melt, thermal expansion of water due to global warming, slowing of the Gulf Stream (there has been a 25% reduction during the past decade), and the melting of ice caps in Greenland and Antarctica. Based on the IPCC's projections the Maine Geological Survey (MGS) is using for its studies a conservative, mid-range estimate of two (2) additional feet of sea level rise by the year 2100.

A. Description of natural hazards affecting the jurisdiction.

After reviewing the FEMA and State Plan list of all natural hazards, a summary table was prepared to use as an overview of all the hazards that could potentially affect Knox County. In conformance with the Maine State Hazard Mitigation Plan - 2018, it was decided that because so many of the County's natural hazards tend to occur in seasonal groups, the summary table and hazard "titles" should be revised to reflect that.

Therefore, events such as thunderstorms, lightning, and tornados will all be found under "Severe Summer Storm Events" though it is possible for them to occur separately and at other times of year. Accordingly, blizzards, ice storms, nor'easters, and snowstorms are grouped under "Severe Winter Storm Events" even though nor'easters can occur in other seasons. In considering the effect of each hazard, it became apparent that the most common result was usually flooding. For that reason, "Dam Failure / Breach," though listed separately on the next table for identification purposes, will appear in the flood hazard sections throughout the rest of the plan.

Non-profiled hazards were eliminated from further consideration in the Plan due to a lack of historical evidence, lack of overall countywide severity, or a low likelihood for the event to occur. There is no guarantee that non-profiled hazards would not occur and cause damage.

Knox County Natural Hazard ID – Summary of Hazards

Hazard Type	Sources of Information	Damage History	Location in Plan
Blight/Infestation	Department of Agriculture, Conservation and Forestry; website State Entomological Office historical records Input from residents County and State Hazard Mitigation Plans	Knox County has small-scale wood product related businesses. There are no historical records of major damage to these products that have caused serious economic conditions.	Not included
Dam Failure	MEMA, Dam Safety Program FEMA Disaster Reports Association of Dam Safety Officials Municipal EMA Directors County and State Hazard Mitigation Plans	In the event of High or Significant Hazard Dam failure, a “flash flood” would be the likely result.	Flooding
Drought	Department of Agriculture, Conservation and Forestry National Integrated Drought Info System Historical Records Existing County and State Hazard Mitigation Plans	Severe, multi-year droughts occurred in Maine in the 1960's, 1980's, 2000 to 2003 and from 2016-2018. However, the effects of drought, such as wells running dry in some areas, have never been sufficient to create disaster conditions in Knox County, although they have increased the danger of wildfires.	Not included
Earthquake (5.0+ magnitude)	Maine Geological Survey Historical records Existing County and State Hazard Mitigation Plans	All of the earthquakes that occur in Maine are intra-plate earthquakes. Maine is far inland from the boundaries of the North American plate that extends from the Mid-Atlantic ridge on the east to the western boundary of the U.S. Maine is near the middle of the plate and is therefore not subject to the frequent, deep, and large earthquakes that are generated by the edges of the tectonic plates bumping into each other.	Not included
Landslide	Department of Agriculture, Conservation and Forestry, Flood Plain Management State Marine Geologist, ME Geological Survey FEMA Disaster Reports Municipal EMA Directors Newspaper articles Review of Historical Records County and State Hazard Mitigation Plans	Landslides although uncommon in Knox County, have occurred causing roadway and property damage. The most significant landslides occurred in Rockland and Thomaston.	Landslide

Hazard Type	Sources of Information	Damage History	Location in Plan
Erosion	<p>Department of Agriculture, Conservation and Forestry, Flood Plain Management</p> <p>State Marine Geologist, ME Geological Survey</p> <p>FEMA Disaster Reports</p> <p>Municipal EMA Directors</p> <p>Newspaper articles</p> <p>Review of Historical Records</p> <p>County and State Hazard Mitigation Plans</p>	Minor Erosion associated with Severe Summer Storms is noted in the Severe Summer Storm Events hazard profiled in this plan.	Summer Storms
Wildfire: • Wildfire/Urban Interface	<p>Forestry, Fire Protection Division</p> <p>State Fire Marshall's Office</p> <p>Wildfire Loose: The Year Maine Burned</p> <p>Input from residents</p> <p>Committee and local knowledge</p> <p>Existing County and State Hazard Mitigation Plans</p>	Much of Knox County has dense forestland cover. Wildfires have been numerous, though small, in the past.	Wildfire
Flooding (includes coastal, riverine, spring and stormwater run off, heavy rains)	<p>MEMA records</p> <p>Department of Agriculture, Conservation and Forestry, Flood Plain Management</p> <p>FEMA Disaster Reports</p> <p>County EMA Director</p> <p>Municipal EMA Directors</p> <p>Newspaper articles</p> <p>Review of FEMA flood studies, FIRM maps</p> <p>Input from residents</p> <p>Emergency declarations</p> <p>Identification of repetitive losses</p> <p>SLOSH Maps</p> <p>Committee knowledge</p> <p>Existing County and State Hazard Mitigation Plans</p>	Flooding is associated with the effects of ice and snow build-up in the hills and rivers, spring runoff and storms including hurricanes. Several repetitive loss properties and roadways are located in the County. Several coastal communities experience coastal flooding during major storm events - winter and summer. The County contains one major river and many streams and lakes, and is located along the coast.	Flooding

Hazard Type	Sources of Information	Damage History	Location in Plan
Hurricanes	MEMA records FEMA Disaster Reports National Weather Service NOAA website Existing County and State Hazard Mitigation Plans	Direct hits from hurricanes in Knox County are few and so are considered in the Severe Summer Storm Events category. Hurricane Edna was the last major hurricane to hit Knox County in 1954.	Severe Summer Storm Events
Summer Storms • Lightning • Thunderstorms	National Weather Service NOAA website County EMA Director Municipal EMA Directors Committee and local knowledge Input from residents Existing County and State Hazard Mitigation Plans	Knox County is frequently hit with thunderstorms, heavy wind and rainstorms, hail and lighting, and rarely by hurricanes. Summer storms are often accompanied by high winds, road and culvert washouts.	Severe Summer Storm Events
Winter Storms: • Blizzard • Ice Storm • Nor'easters • Sleet Storm	MEMA records FEMA Disaster Reports National Weather Service NOAA website News paper articles County EMA Director Municipal EMA Directors Review of past disaster declarations Input from residents Risk assessments Review of library historical data Committee and local knowledge Records from 1998 ice storm County and State Hazard Mitigation Plans	Knox County is frequently hit by blizzards. The impacts of winter storms include erosion and wind damage, road and culvert washouts. The Knox County coastal communities are more often subject to ice/sleet storms.	Winter Storm Events
Other: Avalanche Subsidence Tsunami	FEMA hazards MEMA and FEMA reports County and State Hazard Mitigation Plans	There are no higher elevations in the County that hold large amounts of snow that would create avalanches. There have been no known cases of subsidence or Tsunami (meteo or seismic origin) in Knox County.	Not included Not included Not included

Profiled Natural Hazard Ratings:

The Knox County Hazard Mitigation Planning Team identified and rated natural hazards. These hazards were identified through a process that utilized input from members of the Hazard Mitigation Planning Team, public input, researching past declared and non-declared disaster declarations in the County, a review of current maps, and a risk assessment completed by the Knox County Emergency Management Agency and the Hazard Mitigation Planning Team. The hazards, and their respective ratings, are shown in the following table.

Rating of Profiled Hazards by Hazard Mitigation Planning Team						
Category/Type of Hazard	Potential Damages	Source	2012 Plan Update		2019 Plan Update	
			Rating	Priority	Rating	Priority
Severe Summer Storm Events (Includes storms in the spring, coastal erosion/landslides associated with storms and Hurricanes)	Downed power lines, blocked roadways. Localized flooding and high wind damage to roads buildings, trees and utility lines. Localized flooding and high wind damage to roads buildings, trees and utility lines	NWS, FEMA, & History Local/State Maine Coastal Program	2.5A	1 (tied)	2.5A	1 (tied)
Severe Winter Storm Events	Downed power lines, blocked roadways, and heavy snow damage. Ice Storm Localized flooding and high wind damage to roads buildings, trees and utility lines	NWS, FEMA, & History Local/State	2.5A	1 (tied)	2.5A	1 (tied)
Flooding	Damages to structures in flood zones, dams, bridges, culverts and roadways	DFIRM	2B	2	2B	2
Wildfire	Timber lost, homes lost, businesses lost. October 1947 Fire	Maine Forest Service/ MEMA	2B	3	2B	3
Landslide	Damage to structures, roads & rail line	County/ Local EMA Records	1.5C	4	2.5C	4

Note: The Hazard Mitigation Team used the 5-year timeframe of the Plan as the basis for estimating the likelihood of various hazards (i.e., how likely is the hazard to occur within the next five years)

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

Key to Priority: 1. First Priority, 2. Second Priority, 3. Third Priority, 4. Fourth Priority

Profiling Hazards

B1 Type, location, and extent of all natural hazards that can affect each jurisdiction(s).

B2 Previous occurrences of hazard events and probability of future hazard events.

Severe Summer Storm Events

Introduction.

Severe summer storm damages typically involve downed overhead utility lines, flooding from heavy rain, and debris in the roads (since flooding has been covered in another section, it will not be reviewed in this section).

General Definition of Severe Summer Storm Events.

Severe summer storm events are violent weather phenomenon producing winds, heavy rains, lightning, and hail that can cause injuries, and destruction of property, crops, and livestock that usually occur between June and early October.

Types of Severe Summer Storm Events in Knox County.

There are several different types of potential severe summer storm events in Knox County

Summer Storms

- **Hurricane.** An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach seventy-four miles per hour or more and blow in a large spiral around a relatively calm center called the “eye.” Storms having Tropical Cyclone features but winds less than 74 MPH are considered Tropical Storms.
- **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°F in a split second. The rapid heating and cooling causes thunder.
- **Thunderstorm.** A thunderstorm is formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air such as a warm or cold front, or a sea breeze. 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 of 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 an area 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.

A. Location of Severe Summer Storm Events.

Knox County is subject to severe summer storm events. The entire County is very susceptible to severe coastal summer storms, especially from the very high winds that are involved in such a storm. The entire County is vulnerable to one or more severe summer storms each year, usually in the form of thunderstorms. Within Knox County, severe summer storms have the most impact on shoreline areas along the coast, including harbor areas, and inland along lakeshores and watercourses like the Saint George River. Areas with steep slopes are also adversely affected by summer storms.

Erosion evidenced in Knox County has been the result of severe storms principally. The location of coastal erosion and landslides (though rare) is found in low-lying shoreline areas, where flooding can also often occur.

B. Extent (severity) of the Hazard.

In the summer, southwest to southerly winds may become quite prevalent across Knox County. Because of the frequent formation of sea breezes, southerly winds prevail along the Mid-Coast during the summer months. Severe summer storms bring high winds that 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. Hail can cause crop damage for farmers and backyard gardeners. Lightning strikes can start fires. Any of these weather events can cause personal injury or property damage.

The impact of summer storms in Knox County is usually restricted to flooding caused by the copious amounts of moisture these storms can carry. Interestingly, the interaction of extra-tropical storms *and* hurricanes can produce events of a significant magnitude such as the floods of October 1996.

The most damaging types of summer storms possible in Knox County are F1 tornados and microbursts with winds in excess of 100 miles per hour, and thunderstorms of more than an inch of rain per hour that can wash out roads and result in flash flooding. For more information on the Enhanced Fujita Scale, see the table below or visit this link: <https://www.weather.gov/oun/efscale>

Enhanced Fujita Tornado Scale (abbreviated)		
Tornado Category	3 Second Gust	Typical Effects
EF0	65-85 mph	Gale tornado (weak); light damage to chimneys; breaks twigs and branches off trees; pushes over shallow-rooted trees; damages signboards; some windows broken.
EF1	85-110 mph	Moderate tornado (weak); Moderate damage: peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off roads; trees snapped or broken.
EF2	111-135 mph	Significant tornado (strong); 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.
EF3	136-165 mph	Severe tornado (strong); 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.
EF4	166-200 mph	Devastating tornado (violent); 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.
EF5	Over 200 mph	Incredible tornado (violent); Strong-framed, well-built houses leveled; steel-reinforced concrete structures damaged, tall buildings collapse or have severe deformations; some vehicles can be thrown great distances.

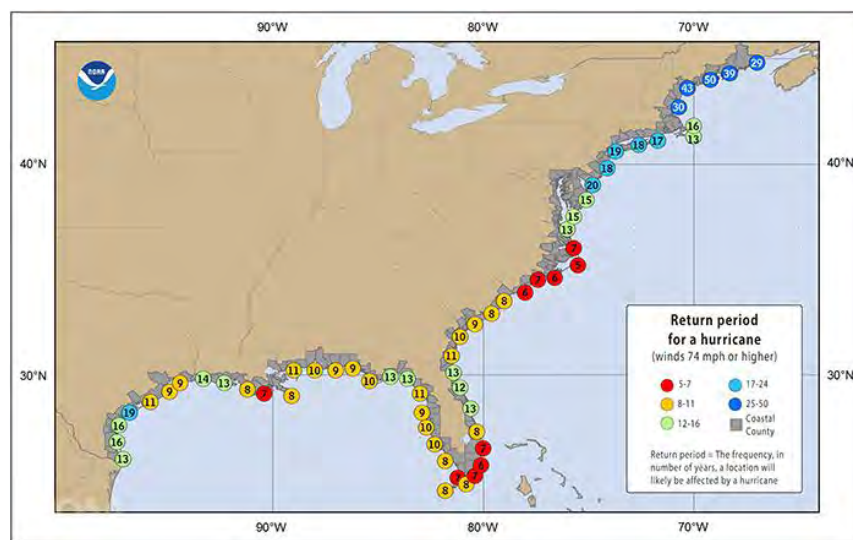
As described in the Maine State Hazard Mitigation Plan, 2018, hurricanes and tropical storms are classifications of tropical cyclones which are relatively large and long lasting, rotating, low pressure weather systems over tropical or sub-tropical waters. Tropical cyclones that can threaten Knox County originate in the Atlantic Ocean, Caribbean Sea, and the Gulf of Mexico. The development phases and progression of a tropical cyclone is captured in the Saffir-Simpson Hurricane Scale shown below and available here: <https://www.nhc.noaa.gov/aboutsshws.php>.

Saffir-Simpson Hurricane Scale		
Category	Definition	Effects
Tropical Depression	Winds up to 38 mph	N/A Tropical disturbances originate in tropical wagtars
Tropical Storm	Winds 39-73 mph	Sustained winds capable of causing structural damage
Hurricane Cagtegrory 1	Winds 74-95 mph	Very dangerous winds will produces some damage
Hurricane Cagtegrory 2	Winds 96 mph-110 mph	Extremely dangerous winds will cause extensive damage
Hurricane Cagtegrory 3	Winds 111-129 mph	Devastating damage will occur
Hurricane Cagtegrory 4	Winds 130-156 mph	Catastrophic damage will occur
Hurricane Cagtegrory 5	Winds 157+ mph	Catastrophic damage will occur

Source: Maine State Hazard Mitigation Plan 2018

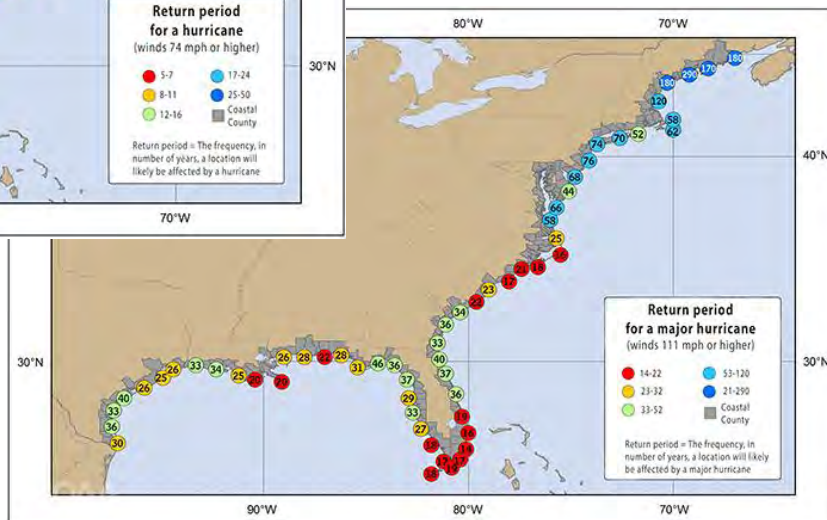
Note: hurricanes with winds greater than 110 mph (Categories 3, 4 and 5) are major hurricanes

According to National Hurricane Center predictive analysis, a hurricane with wind speeds greater than 74 MPH (CAT 1 or 2) can be expected to return within 50 miles of Knox County every 50 years. A Major (CAT 3 or higher) storm could return within 50 miles of Knox County every 290 years.

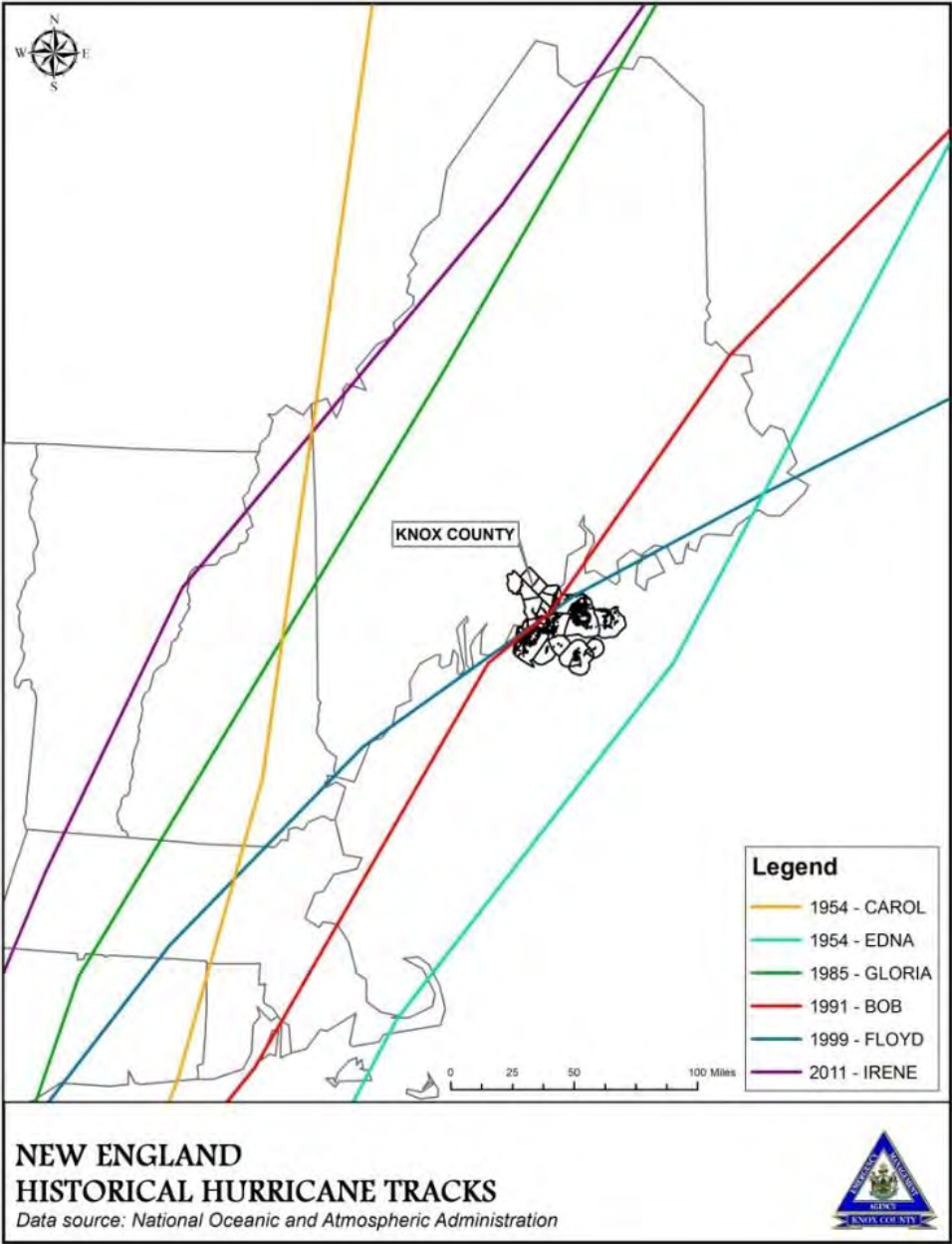


Hurricane Cat 1 & 2

Major Hurricane Cat 3, 4 & 5



Hurricane season in the Atlantic runs from June 1 to November 30, and hurricane threats increase late in the summer as ocean temperatures have warmed. Hurricanes typically weaken before reaching Maine. While unlikely, it is possible for strong storms to reach the state. Hurricane forecasts will have uncertainty due to variables of the hazard which include forward track and approach, storm speed, wind speed, storm size and precipitation and high altitude steering currents. The map below shows some notable storms which have affected Maine and Knox County.



C. Previous Occurrences.

The following table contains a summary of severe summer storms that have occurred in Knox County. Note: Flooding during the spring is often a result of snowmelt, which may be from winter storms.

Historical Summary of Severe Summer Events in Knox County			
Year	Incident Period	Financial Assistance for Knox County and Description/ FEMA Incident Type	Declaration
1954	Sept 2 -15	NA / "Hurricane Edna"	None
1954	Aug 25 - Sept 1	NA / "Hurricane Carol"	None
1985	Sept 16 - Oct 2	NA / "Hurricane Gloria"	None
1991	Aug 16 - 20	NA / "Hurricane Bob"	Presidential FEMA-915-DR (<i>IA only Knox County</i>)
1999	Sept 7 - 19	NA / "Hurricane Floyd"	None
2009	April	NA / Severe Storm	None
2009	June 18 - July 8	\$206,475 Severe Storms, Flooding, and Landslides	Presidential FEMA-1852-DR
2015	Sep 30	\$721,669 Severe Storm, Flooding (* <i>Local Damage Assessments</i>)	Undeclared
2017	October 29 - November 1	\$226,367* Severe Storm and Flooding	Presidential FEMA-4354-DR

Source: FEMA/MEMA & Local Records. Notes: * This disaster is still open; the figure represents PA Projects approved as of January, 2019. Of the hurricanes listed in this table, only Hurricanes Edna and Bob hit Knox County directly. For the other hurricanes listed, heavy rain, winds and flooding occurred, but not at hurricane-strength levels.

D. Probability of Occurrence.

There are no probability studies available of summer storms; however, based on past experiences, the County can expect thunder and lightning every year. It is expected that a severe summer storm will create damage in Knox County at least once every three years. There have been no EF2-5 tornados documented in Knox County since 1950. Historically, the probability of an F2-5 tornado is low and will not be considered further in the Plan.

Severe Winter Storm Events

Introduction.

Severe winter storm damages typically involve downed overhead utility lines, flooding from heavy rain, ice jams and melt off, and debris in the roads (since flooding has been covered in another section, it will not be reviewed in this section).

General Definition of Severe Winter Storm Events

Severe winter storm events are violent weather phenomenon producing winds, heavy snow, and sleet and ice that can cause injuries, and destruction of property, crops, and livestock. Low temperatures, strong winds, and often large quantities of ice and snow distinguish severe winter storms and weather conditions.

Types of Severe Winter Storm Events in Knox County.

There are several different types of potential severe storm events in Knox County.

- **Blizzard.** Sustained winds and frequent gusts of 35 miles per hour (mph) with heavy falling or blowing snow, persisting for three hours or more, which frequently reduces visibility to less than ¼ mile.
- **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.
- **Heavy Snow Storm.** A snowfall of fifteen inches or more within 12 to 24 hours, which disrupts or slows transportation systems and public safety departments' response capability.

A. Location of Severe Winter Storm Events.

The entire County is subject to major snowfall events; however, the northern, inland portion of the County typically will receive greater snowfall amounts. Especially impacted areas includes windswept areas of higher elevations and areas with steep slopes. The entire County can experience a major ice storm, as it did in January 1998, however, the shoreline of coastal communities on the mainland and on the islands, which contain the vast majority of the population, experience freezing rain, sleet, tide surges, flood damage, and ice storms more frequently. The entire County is very susceptible to "Nor'easter" winter storms.

B. Extent (severity) of the Hazard.

During the winter months, Knox County often has heavy snowfall, or snow combined with high winds, freezing rain or ice storms. Significant rainfall also often occurs during winter months. Nor'easters, the most severe form, can 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 Knox County. 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. The extent of one winter weather event can be exacerbated if it occurs shortly after a previous weather event.

Average seasonal snowfall amounts generally increase north and northwestward from the coastal region. Total seasonal snowfall ranges between 50 and 80 inches in the Coastal Division in which Knox County is located.

Occasionally, Knox County will experience a *Norlun Trough*, as it did in 2016 when two Knox County island towns in Penobscot Bay; Vinalhaven and North Haven, experienced 24 - 26 inches of snow, while nearby mainland areas received single digit snowfall. The WMTW website describes a *Norlun Trough* as follows: "It's a line where we have instability along it and then air converges and rises and

we get prolific snow or heavy snow at times. It can last awhile. It doesn't have to move very far. It's kind of like a lake-effect snow band in the winter time where some towns could get a foot and a few towns down only get a few inches."

The snowfall season usually runs from November to April and sometimes into May. Occasionally an early season storm can bring snow in the first weeks of October even along the coast. January is usually the snowiest month and December usually 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.

C. Previous Occurrences.

Federally declared winter storm disaster events affecting Knox County since 1978 are shown in the next table. The Maine storm of record occurred in January 1998 and caused \$305,292 in damage throughout Knox 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 large snowstorms which over task the highway snow removal operations and cause localized power outages.

In 2008 a series of severe winter storms including an ice storm caused over \$650K in damages to Knox County. This storm, like the "*Great Ice Storm of '98*", forced closure of many roads due to tree and utility debris and ice while also causing widespread power outages.

The next table is a summary of some of the most severe winter storms during the past 47 years:

Historical Summary of Severe Winter Events in Knox County			
Year	Incident Period	Damages	Declaration
1972	March 7	\$12,541 Rain/Snow/Ice, Severe Storms, Flooding	Presidential DR-326
1993	March 13 - 17	\$14,857 Blizzards, Severe Winds and Snowfall, Coastal Storm	Presidential EM-3099
1998	January 5 - 25	\$305,292 Ice Storms " <i>Great Ice Storm of '98</i> "	Presidential FEMA-1198-DR
2005	February 10 - 11	\$173,642 Snow	Presidential EM-3206
2005	March 29 - May 3	\$429,928 Severe Storms, Flooding, Snow Melts, and Ice Jams	Presidential FEMA-1591-DR-ME
2008	December 11 - 29	\$659,827 Severe Winter Storm and Flooding	Presidential FEMA-1815-DR
2010	Feb 23 - Mar 2	\$230,305 Severe Winter Storms and Flooding	Presidential FEMA-1891-DR
2013	Feb 8 - 9	\$337,448 Winter Storm, Snow Storm, Flooding	Presidential FEMA-4108-DR

Historical Summary of Severe Winter Events in Knox County (cont'd)			
Year	Incident Period	Damages	Declaration
2013	Dec 21 - Jan 1 2014	\$338,414 Severe Winter Storm, Ice Storm	FEMA Undeclared Rcvd SBA Declaration #13897/ME-042
2014	Nov 2 - 6	\$213,305 Winter Storm/Heavy Snow (* <i>Local Damage Assessments</i>)	Undeclared
2017	Feb 12 - 14	\$317,688 Severe Winter Storm, Blizzard (* <i>Local Damage Assessments</i>)	Undeclared

Source: FEMA/MEMA & Local Records.

Statewide Storm of Record: The “Great Ice Storm of ’98.”

The storm began January 5th and continued through January 25, 1998. During this time, residents in Knox County and statewide experienced effects from freezing rain, high winds, snow and ice. The combination of peak low-pressure areas, abundant moisture in the atmosphere, and cold temperatures near the ground caused significant rainfall and severe icing. Gusts were reported up to 50 miles per hour and brought much colder air and temperatures dropped to single digits. Wind chills were in the minus twenty to minus forty-degree range. The mixture of precipitation continued into the afternoon of January 25, with significant icing along the coast. Extending from western New York to Maine, below-freezing temperatures combined with record rainfall contributed to the formation of a blanket of solid ice. In some places, more than three inches of ice coated the rural and urban landscape.

On January 13, fifteen of Maine's sixteen counties were declared a federal disaster area, including Knox County, eligible for Infrastructure Support assistance. The Disaster Declaration was amended to cover Individual Assistance on January 15, and Aroostook, the final county, was added. Hazard Mitigation funds to reduce future disaster risks were made available on January 13.

At its peak, more than half of Maine's population was without power, caused by ice that coated lines and branches an inch-thick. Many state and secondary roads were closed because of downed trees on power lines. State, county, and municipal government offices were closed, and innumerable businesses were forced to close and remain closed because of blocked roadways and power outages. As a result, 130 emergency shelters were opened throughout the state. Heat, electricity, refrigeration, running water, and sanitary facilities were all interrupted by the power outage. Maine Public Television and Radio remained unavailable to most viewers for more than a week. Other commercial radio and television stations in South-central Maine lost communication towers and or electrical power and were unable to broadcast. Even the Emergency Alert System failed.

D. Probability of Occurrence.

It is expected that a severe winter storm will create damage in Knox County at least once every three years.

Neither the State of Maine, nor the National Weather Service, maintain data on snowfall and ice accumulation on a town-by-town basis. On average, the length of annual maximum snow cover is about 50 days along the coast

Flooding

Introduction.

Flooding in Knox County takes place at many different intervals. Flooding results from spring thaw, severe storms and heavy rains.

General Definition of Flooding.

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 Knox County's geology and hydrology is such that flooding is usually fast rising but of short duration.

Types of Flooding in Knox County.

There are several different types of potential flooding in Knox County:

- **Coastal Flooding.** The temporary inundation of beaches and other land areas by the sea, usually as a result of coastal storms. Coastal flooding comes with two significant components: still water and storm surge. The typical high winds associated with coastal flooding exacerbate the flooding by "pushing" more water toward land. A nor'easter can cause a storm surge along the coast of Maine. Fetch, or the distance the wind can blow toward the shore from out at sea is a significant factor in coastal flooding depths. The shape of the ocean floor just offshore is another variable.
- **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 snowmelt 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 floodwaters.
- **Lacustrine.** (Lake 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 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 sport camps 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 run off, but can also be caused by major rain storms.
- **Storm surge.** An abnormal rise of water that is generated by a storm, over and above the predicted astronomical tide.
- **Tsunami.** A wave produced by a disturbance that displaces a large mass of water – usually a result of geologic activities such as earthquakes, volcanic eruptions, underwater landslides, or in rare geologic cases, meteor strikes. After such a disturbance, displaced water travels outward from its site of origin as a series of unusually large waves at great speeds (Komar, 1996). All areas with an elevation less than 100 feet and within a mile of the coast could be impacted by a tsunami. Based on information obtained from the Maine Geological Survey, the chances of a catastrophic event are minimal. Moreover, with the presence of the relatively shallow Georges Bank offshore, Maine remains protected from the full force of an Atlantic Ocean tsunami. In Oct of 2008 a rare “*MeteoTsunami*” occurred in the Midcoast town of Boothbay Harbor (FMI, see <https://nws.weather.gov/nthmp/documents/meteotsunamis.pdf>)
- **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 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.
- **Beaver Dam Flooding.** Flooding resulting from back-up and overflow of water resulting from beaver dams.

A. Location of Flooding Hazard.

All of Knox County has locations that are susceptible to flooding. Knox County’s susceptibility to flooding is further exacerbated by the wide-ranging weather variables. Due to seasonal (and regional) factors such as heavy rains, rapidly melting snow pack and/or ice jams, major flooding most frequently occurs between December and May. Based on MEMA data, the most flood prone months are April, January and March respectively. Floods can also be caused by severe storm events, including hurricanes, and may be further affected by rises in sea levels. Floods can saturate blueberry barrens, hay fields, and niche farm fields. Flood zones are mapped under the NFIP program. These maps are available at municipal offices.

There is one river located in Knox County. The St. George River flows through the towns of Appleton, Union, Warren, Thomaston, South Thomaston, Cushing and St. George. There are no dams on the St. George River. Flooding from the St. George River happens on occasion, but it is not severe. There are several dams located at the outlets of lakes and ponds that are very small and would not have a major flooding impact. However, on Megunticook Lake there are two dams, Megunticook East and Megunticook West, which the State has classified as High Hazard dams. If these dams were to fail, it would cause major flooding in downtown Camden. The Town of Camden, owner of the dams, has addressed this possibility by developing an Emergency Action Plan, which must be revised every two years, according to State law. Additionally, there is another town-owned High Hazard Dam in Camden, Seabright, which was is regulated by FERC until 2018.

Knox County has approximately 768 miles of coastline, some of which susceptible to coastal flooding. The most susceptible communities to sea level rise and storm surge related coastal flooding are Camden, Cushing, Friendship, North Haven, Owl’s Head, Rockland, Rockport, St. George, South Thomaston, and Vinalhaven. There is a State of Maine Ferry Service at Rockland that services the islands of North Haven, Vinalhaven and Matinicus Island Plantation and this service could be

impacted by coastal flooding. Rare astronomically high “*King tides*” observed and documented during November of 2016 could increase with the potential for future sea level rise. Photo comparisons of King Tide vs. normal high tide levels were obtained locally to support the NWS Coastal Flood Program. Those images are included in Appendix D.

The majority of the flood damage in the County is caused by winter runoff in the springtime, which undercuts or overtops local roads. When Maine has an above average snowfall for the winter and then warmer temperatures and rainfall suddenly arrive in the spring, the snow pack melts off more quickly than the watersheds can handle. This can cause local water bodies to overflow their boundaries and flood nearby road surfaces. Typically, the road damage is not major, although it can absorb the municipal road budget for an entire year and does happen in several towns every year.

Extent (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 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. Accordingly, Maine law requires that dams classified as High or Significant Hazard dams must have current Emergency Action Plans (EAPs). By definition, if they failed, High Hazard dams could cause loss of life; Significant Hazard dams could cause significant property damage and Low Hazard dams would generally cause damage only to the owner's property. Usually, dams that produce electricity are regulated by the Federal Energy Regulatory Commission (FERC). The others are regulated by Maine Emergency Management Agency (MEMA).

In Knox County, there are three High Hazard dams, all upstream of the town of Camden. Per their hazard classification, and EAPs, failure of these dams could cause loss of life in Camden, and seriously damage downstream buildings, businesses and the harbor.

Knox County has four Significant Hazard dams, as shown in the next table. Per their hazard classification, and EAPs, if these were to fail, the Lermond Pond Dam would damage the downstream roads in the eastern portion of Union and possibly two homes. Either Henderson Dam could damage the west end roads of Camden. Tolman Pond could damage Mill Street. The County also has 21 low hazard dams and 9 unranked or unclassified dams that are not included in the table.

Knox County High Hazard and Significant Hazard Dams					
MEMA ID	Dam Name	Other Name	Dam Owner	Town	River / Water body
High Hazard Dams					
81A	Megunticook East	Knox # 1	Camden, Town of	Camden	Megunticook
81B	Megunticook West	Knox #2	Camden, Town of	Camden	Megunticook
377	Seabright		Camden, Town of	Camden	Megunticook
Significant Hazard Dams					
85	Lermond Pond	East Union	Richard Morgan	Union	Mill Stream
864 A	Henderson #1		Henderson Lake Association	Camden	unknown
864 B	Henderson #2		Henderson Lake Association	Camden	unknown
524	Tolman Pond	Tolman Rec Dev	Tolman Park Association	Rockport	Oyster River

Source: MEMA

Extent (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, fire-fighting efforts can be compromised if fire fighters and equipment are responding to a flood emergency.

Generous precipitation (about 46 inches a year) contributes to the flood potential. Low pressure systems 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 County's most valuable natural resources and can be a hazard.

C. Previous Occurrences.

The next table contains a summary of floods that have occurred in Knox County:

Historical Summary of Flooding Events in Knox County			
Year	Incident Period	Damages	Declaration
1987	Mar 30 - April 12	\$13,062 Severe Storms, Flooding	Presidential FEMA-788-DR
1992	Mar 10 - Apr 6	\$91,712 Flooding, Heavy Rain, Ice Jams	Presidential FEMA-940-DR
1996	April 16 - 17	\$434,989 Flooding and Mudslides	Presidential FEMA-1114-DR (addendum to 1106-DR)
2005	March 29 - May 3	\$429,928 Severe Storms, Flooding, Snow Melts, and Ice Jams	Presidential FEMA-1591-DR-ME
2007	March 16 - 18	\$589,399 Flooding	Presidential FEMA-1691-DR-ME
2007	April 15 - 23	\$375,046 Severe Storms and Inland and Coastal Flooding	Presidential FEMA-1693-DR-ME
2008	April 28 - May 14	\$361,835 Severe Storms and Flooding	Presidential FEMA-1755-DR
2009	December 11 - 29	\$659,827 Severe Winter Storm and Flooding	Presidential FEMA-1815-DR
2009	June 18 - July 8	\$206,475 Severe Storms, Flooding, and Landslides	Presidential FEMA-1852-DR
2010	February 23 - March 2	\$230,305 Severe winter storms, flooding	Presidential FEMA-1891-DR
2015	Sep 30	\$721,669 Severe Storm, Flooding (*Local Damage Assessments)	Undeclared
2017	October 29 - November 1	\$226,367* Severe Storm and Flooding	Presidential FEMA-4354-DR

Source: FEMA/MEMA Note: *This disaster is still open, so this figure represents FEMA totals or Damage Assessments as of Jan, 2019. Flooding during the spring is often a result of snowmelt, which may be from winter storms.

D. 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. 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 Maine Geological Survey estimates that the ocean has risen about seven (7) inches since 1900, and is currently rising at a rate of about $1/10^{\text{th}}$ of an inch per year. The result has been increased flooding, erosion of coastal bluffs and landslides. The consensus of the scientific community, reflected in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) is that sea level will continue to rise at an accelerating rate through the year 2100. A storm that had a 1% chance of occurring in any one year (the 100-year storm) at the current sea level elevation has a more than 1% chance of occurring in any year at a higher sea level elevation. With sea level rise, more homes, businesses, public infrastructure such as roads, and entire communities will be subject to more devastating coastal floods on a more frequent basis.

Wildfire (also known as Wildland fires)

Introduction.

Much of the County is covered with forests. Wildfires have been numerous, though small, in the past and have the potential to damage or destroy structures, especially in the more rural sections of the County. Wildfires can negatively affect the forestry economy as well.

General Definition of Wildfire.

Wildfire/Wildland fires are defined as those fires that burn vegetative cover: grass, brush, timber or slash (Clayton 1985). Though wildfire is a natural phenomenon and can be ignited by lightning, people have become the greatest cause of fires in the County. Wildland urban interface fires are created where homes meet with highly volatile forest fuels.

Types of Wildfire in Knox County.

There are several different causes of wildfire events in Knox County. 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: lightning, campfire, smoking, debris burning – which can include backyard burning as well as the agricultural practice of “burning over” blueberry fields, incendiary (includes arson), machinery, railroad children, miscellaneous, and fireworks. The number and acreage of fires by cause is shown in table on the following page.

Number/Acreage of Fires by Cause in Knox County 2014 - 2018											
	Light	Camp	Smoke	Debris	Incend	Mach	RR	Child	Misc	Fireworks	Total
2014		1/0.1				1/0.1			1/4.75		3/4.95
2015		2/4.2	1/0.1	2/0.5		1/0.1		1/0.2	1/0.1		8/5.2
2016	1/0.2	1/0.1		10/12.65	1/0.1	1/0.3			5/0.6	2/0.2	21/14.15
2017		2/0.2		8/4		1/0.1		1/0.1	4/1.55	1/0.1	17/6.05
2018				8/5.2		1/1.5			2/0.6		11/7.3
Total	1/0.2	6/4.6	1/0.1	28/22.35	1/0.1	5/2.1	0	2/0.3	13/7.6	3/0.3	60/37.65

Source: Maine Forest Service, 2019

Note: Fires burn an annual average of about 5.5 acres annually in Knox County.

A. Location of Wildfire.

All parts of the County are subject to wildfire/wildland fires. However the northern portion of the county has the least accessibility to emergency services due to the lack of proper roads. The southern portion of the County has a larger number of homes and businesses within the Wildland-Urban Interface but better access to emergency services. Islands have an increased risk in areas where downed old growth softwood trees and limited access provide a significant fuel load and would delay suppression response.

B. Extent (nature) of the Hazard.

In 2006, Knox County was estimated to have 173,100 acres of forestland, about 74% of the County land area (Maine Land Cover Dataset, 2006). The County's forestland base has remained essentially stable for the last several decades and is close to the estimated acreage of forestland present at the time of European settlement.

The entire County remains at risk for wildfires. Well-distributed rainfall normally reduces forest fire risks, but seasonal variations, rapidly draining soils and unusually dry periods can induce major blazes. In addition, insect damage diseases, severe weather, and residential and commercial developments in wooded areas greatly increase the potential for catastrophic fires. Over time, a considerable fuel supply can accumulate from the ignitable slash of some timber harvesting operations and/or from dead trees left standing on the forest floor after insect infestations. With an increase in drought conditions, wildfires could originate anywhere.

Several demographic factors make Knox County's rural areas less resistant to the threat of wildfires. The in-migration of persons over age 65 and the outmigration of young people (up to age 25) from rural areas often leave an older, more vulnerable population, that usually depend on just volunteer fire departments. As in all of Maine, Knox County's housing stock is aging. When old farm homes and wood frame buildings are located in remote forested areas, it can be very challenging for volunteer firefighters to respond before the structures are destroyed, especially since 90% of all firefighters in Maine are volunteers.

C. Previous Occurrences.

There were 63 reported wildfires in Knox County from 2014 – 2018, an average of slightly more than 12 wildfires annually, which burned about 38 acres total, or an average of about 8 acres per year. The

Maine Forest Service does not have records of a major forest fire (covering 500 or more acres) having occurred in Knox County between 1934 and 2019. Less than 1 % of the fires were caused by nature (lightning). About 99.5% were caused by human-related occurrences, such as machinery, fireworks, smoking, camp fires, etc. Less than 14% of the acres burned were on the islands.

The most severe wildland fire in the County's recent history occurred in October of 1947. Statewide, it burned 17,846 acres, destroyed approximately 400 homes, and caused three deaths on Mount Desert Island. In recent years, there have been about a dozen and a half low-acreage wildfires annually in Knox County, most of which are confined to about an acre in extent.

D. Probability of Occurrence.

Knox County is subject to minor wildland fire events. About 74% of the County is forestland and the accessibility by vehicle to many areas is limited. Wildfire danger areas are shown on the County Base Maps included in this section.

It is expected that low acreage wildland fire events will cause damages in Knox County several times each year; however, they do not rise to the level of the 1947 fire as there have been considerable mitigation efforts through suppression and training. Knox County has an active countywide fire fighters' association, automatic mutual aid, up-to-date fire-fighting resources and communication systems in place. The Maine Forest Service has made exceptional contributions in public education.

Landslide

Introduction

Landslides are uncommon in Knox County, although one occurred in Rockland and one occurred in Thomaston. Unstable coastal bluffs in excess of 20 feet in height will likely be subject to landslides on a more frequent basis as a result of severe storms, flooding and sea level rise.

General Definition of Landslide

A landslide is the downslope movement of earth materials (due to gravity) along a surface of rupture (shear plane).

Types of Landslides in Knox County

The only recorded landslides in Knox County were in the coastal zone. Factors contributing to these landslides include steep slopes, clay sediment layering and water from storm runoff or coastal flooding. No landslides have been recorded inland on hillsides, mountains or other steep areas.

A. Location of Landslide

A landslide took place in Rockland along a portion of Waldo Ave that abuts Rockland Harbor. A landslide took place in Thomaston along a portion of rail line that abuts the riverbank of the St. George River.

B. Extent (nature) of the Hazard.

Coastal landslides are triggered by chronic bluff erosion in areas with mud banks that exceed 20 feet in height. In contrast to the erosion that occurs on the face of a bluff less than 20 feet in height, a

coastal landslide is the result of the internal instability of sediment bluffs and their potential to rapidly move large amount of land down-slope under the influence of gravity. In general, landslide-prone bluffs have the following characteristics:

- A high, steep face;
- Clay sediment;
- Erosion near the high-tide line; and
- A high ground water table.

A Steep Slopes map is included in Appendix A of this plan that shows areas where a landslide potential exists.

C. Previous Occurrences.

A landslide occurred in Rockland in the spring of 1996. That landslide sent two homes and 300 feet of bluff into the harbor. The clay that made up the bluff sheared into blocks, losing its strength as it collapsed. The cost of mitigation was \$848,000. A landslide occurred in Thomaston in the winter of 2010 along a portion of rail line that abuts a riverbank. The landslide/washout was about 45 feet wide by the tracks and up to 150 feet wide by riverfront. That landslide resulted in the temporary closure of a state owned rail line that supports local industry dependent on freight rail and seasonal passenger tourist service. MaineDOT reported engineering and construction costs of \$102,648 for repair of the damaged area and rail line.

D. Probability of Occurrence.

No probability studies have been done, and predictive models do not exist. However, Maine Geological Survey is developing landslide maps along the Maine coast. As these maps are completed, they are presented to the towns for future planning purposes.

Assessing Vulnerability: Overview
<p>Requirement §201.6(c)(2)(ii): (The risk assessment shall include a) description of the 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 structures that are repetitively damaged by floods.</p> <p>The Plan should describe vulnerability in terms of:</p> <ul style="list-style-type: none">A. The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;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 estimates;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. <p>iii. For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.</p>

Overall summary of vulnerability to each hazard and impact of each hazard on Knox County (B3)

A. Vulnerability of Knox County to each hazard:

Severe Summer Storm Events. The entire County is vulnerable to thunderstorms, microbursts, tornados, high winds and hurricanes.

Severe Winter Storm Events. The entire County is vulnerable to severe winter storms, including ice storms. As noted earlier in this Assessment, Knox County has been included in a number of Presidential Disaster Declarations for winter storms.

Flooding. With the exception of a few downtown portions of Camden and Rockland, most of the developed areas in Knox County are located outside of designated flood plains, and are thus not very vulnerable to riverine flooding. On the other hand, a large portion of the county is very rural in nature, and is 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 system by ice or debris, even though these roads may not be in an identified flood plain.

Wildfires. Most of Knox County is forested, about 74%, and likely to experience small wildfire/wildland fire events.

Landsides. Those limited areas with unstable coastal bluffs in excess of 20 feet in height may become vulnerable to landslides on a more frequent basis because of severe rain storm events, flooding, and sea level rise.

B. Impacts of each hazard on Knox County Maine:

Severe Summer Storm Events. The damages from 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.

Severe Winter Storm Events. The damage 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. If severe and prolonged enough, it could result in 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.

Flooding. The typical damages resulting from flooding in Knox County include damage 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 damages to town and personal vehicles. In some cases, entire communities have been partly or completely isolated because the only road serving the town has been become impassable.

Wildfire. The impacts of wildfires include the destruction of woodland forest stands of trees and other vegetation, which when located on steep slopes and/or near watercourses can increase erosion and pollution to water bodies. Loss of income from wood products destroyed and non-commercial properties enrolled in the state tree growth program for private property owners can occur from wildfires. Although uncommon in Knox County, structures in the urban interface including residences can be damaged or destroyed from wildfires. Temporary road closures may be warranted when wildfires are close to roadways or cross over roadways.

Landslide. The impacts of landslides include the damage or destruction of structures located in landslide prone areas, the potential for injury and loss of life, as well as damage to public infrastructure including roadways and utility lines.

Repetitive Loss Properties (B4)

Based on information contained in the Maine State Hazard Mitigation Plan - 2018 prepared by Maine Emergency Management Agency, there is only one repetitive loss property in Knox County. This property is a residential structure that has incurred two losses under the NFIP program. The Federal Privacy Act prohibits disclosure of the addresses, owners or claim information of these repetitive loss properties.

A. The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas:

Severe Summer Storm Events:

- **Buildings.** All buildings in Knox 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. There are approximately 48 roads/road segments in Knox County vulnerable to flooding.
- **Critical facilities.** All critical facilities in Knox 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. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with coastal flood surge zone hazard areas in order to determine what assets are potentially impacted.

Severe Winter Storm Events:

- **Buildings.** All buildings in Knox County are vulnerable to winter storms. Damages can include burst water pipes during power outages due to subfreezing weather and a lack of heat and/or pumps, which require electricity to function, interior water damages due to ice dams forming on roofs, and occasionally, roof collapses due to heavy snow loads.
- **Infrastructure.** Roads and their associated storm drainage systems are the most vulnerable category of infrastructure. There are approximately 48 roads/road segments in Knox County vulnerable to flooding. They can become temporarily blocked due to heavy snow, ice, and debris falling over a short period of time, or ice that can build on their surfaces. Water main breaks due to cold weather can also occur.
- **Critical facilities.** All critical facilities in Knox County are vulnerable to winter 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 heating systems to continue operating during a power outage. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with coastal flood surge zone hazard areas in order to determine what assets are potentially impacted.

Flooding:

- **Buildings.** Very few buildings in Knox County are vulnerable to flood damages. There is only one property identified in Knox County due to repetitive loss; it is a single-family

dwellings in Owls Head. With the exception of downtown portions of Camden and Rockland, most of the developed areas in Knox County are located outside of designated floodplains, and are thus not very vulnerable to flooding.

- **Infrastructure.** Roads and their associated storm drainage systems are the most vulnerable category of infrastructure. There are approximately 48 roads/road segments in Knox County vulnerable to flooding. Much of the county is very rural in nature, and is 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.
- **Critical facilities.** Due to the varied topography within the County and the availability of higher elevation sites within all municipalities, nearly all critical facility structures are located outside of floodplains. Possible exceptions include some wastewater treatment plants, due to the need to locate these facilities at lower elevations. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with coastal flood surge zone hazard areas in order to determine what assets are potentially impacted.

Wildfire:

- **Buildings.** Buildings in the wildland urban interface within Knox County are vulnerable to wildfires. Damages can include fire damage and destruction.
- **Infrastructure.** Roads are vulnerable to temporary closure when wildfires are nearby or cross roadways.
- **Critical facilities.** Very few critical facilities in Knox County are identified as vulnerable to wildfires in the same manner that individual residential buildings may be vulnerable. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with forested areas in order to determine what assets are potentially impacted.

Landslide:

- **Buildings.** Buildings in the landslide prone areas, as defined previously in this section and as mapped, within Knox County are vulnerable to landslides. Damages can include structure damage and destruction.
- **Infrastructure.** Roads are vulnerable to temporary closure when landslides are nearby or cross roadways. Landslides have affected three road segments with temporary closures. If the landslide includes the roadway itself, the closures may be longer term as reconstruction and realignment efforts are undertaken.
- **Critical facilities.** No critical facilities in Knox County are identified as vulnerable to landslides in the same manner that individual residential buildings may be vulnerable. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with landslide prone areas in order to determine what assets are potentially impacted.

B. Vulnerability of future buildings, infrastructure, and critical facilities

Severe Summer Storm Events:

- **Buildings.** New buildings in Knox County will be less vulnerable to severe summer storms because they are built to meet modern code requirements. State-mandated shoreland

zoning ordinance regulations for areas within 250 feet of the shoreline of the coast, lakes and ponds, and within 75 feet of streams, limit the location of new buildings in areas prone to coastal erosion and storm surges that often result from severe summer storm events. Damages may include roof damage from falling trees and debris. There will be less Interior water damage due to wind-driven heavy rains because the roofs of newer buildings generally are properly designed and roofing materials are more resistant to water infiltration.

- **Infrastructure.** Roads will continue to be the most vulnerable category of infrastructure. New roads can be blocked on a temporary basis due to heavy rainfall, and debris such as tree limbs accumulating on the road surface during a storm event.
- **Critical facilities.** Future critical facilities in Knox County will be vulnerable to summer storms in the same manner that individual buildings will be vulnerable. However, some of them will have back-up generator systems which will allow building systems to continue operating during a power outage. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with coastal flood surge zone hazard areas in order to determine what assets are potentially impacted.

Severe Winter Storm Events:

- **Buildings.** New buildings in Knox County will be less vulnerable to severe winter storms because they are built to meet modern code requirements. 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 designed to withstand heavy snow loads. State-mandated shoreland zoning ordinance regulations for areas within 250 feet of the shoreline of the coast, lakes and ponds, and within 75 feet of streams, limiting the location of new buildings in areas prone to coastal erosion and storm surges that often result from severe winter storm events. Damages may include burst water pipes in winter, but many newer buildings will be better insulated than older ones, thus being better able to retain heat during longer periods of time when there is a power outage.
- **Infrastructure.** Roads will continue to be the most vulnerable category of infrastructure. New roads can be 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.
- **Critical facilities.** Future critical facilities in Knox County will be vulnerable to winter storms in the same manner that individual buildings will be vulnerable. However, some of them will have back-up generator systems which will allow building systems including heating systems to continue operating during a power outage. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with coastal flood surge zone hazard areas in order to determine what assets are potentially impacted.

Flooding:

- **Buildings.** All of the municipalities in Knox County are in the flood insurance program, and all have municipal shoreland zoning ordinances that prohibit the construction of residential, commercial and industrial structures in floodplains.
- **Infrastructure.** State and local road construction standards generally ensure that new roads are properly constructed with adequate storm drainage systems. Road construction exceeding \$100,000 must be designed by a registered professional engineer. Therefore,

roadway flooding should not be as likely or as serious for new roads as it is for old roads in Knox County.

- **Critical facilities.** Because of the requirements of the Flood Insurance Program, as well as state-mandated shoreland zoning 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. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with coastal flood surge zone hazard areas in order to determine what assets are potentially impacted.

Wildfire:

- **Buildings.** New buildings in Knox County within the Wildland urban interface will be vulnerable to wildfires, as will those constructed at higher elevations on windswept ridgelines. Damages may include scorched exterior walls, roofs or complete destruction.
- **Infrastructure.** Roads will not likely be a vulnerable category of infrastructure. New roads can be blocked on a temporary basis due to wildfires, debris such as burned tree limbs accumulating on the road surface during a wildfire event.
- **Critical facilities.** Only those future critical facilities in Knox County that are located within the Wildland urban interface will be vulnerable to wildfires in the same manner that individual buildings will be vulnerable. However, clearing around such facilities will be maintained to reduce the probability of such events. The municipal base maps that are included in this Plan update identify the location of critical facilities. The purpose of these maps is to identify those facilities that overlap with forested areas in order to determine what assets are potentially impacted.

Landslide:

- **Buildings.** New buildings in Knox County will be less vulnerable to landslides, due to the mapping and regulation of such areas through State-mandated shoreland zoning ordinance regulations for areas within 250 feet of the shoreline of the coast, lakes and ponds, and within 75 feet of streams, restricting the location of new buildings in areas prone to landslides.
- **Infrastructure.** Roads near landslide prone areas will continue to be the most vulnerable category of infrastructure. New roads can be blocked on a temporary basis due to landslide activity, and debris such as mud accumulating on the road surface during such an event. State law restricts the construction of new roads in landslide prone areas.
- **Critical facilities.** Future critical facilities in Knox County will not be located in landslide prone areas and will thus not be vulnerable to landslides. The municipal base maps that are included in this Plan update identify the location of critical facilities.

B. An estimate of the potential dollar losses to vulnerable structures and a description of the methodology used to prepare the estimates

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; the average annual Consumer Price Index for various years is shown below based on a value of 100 for the years 1982-1984 (Knox County EMA has the capability of performing HAZUS runs and is working towards developing information on its website about this analytical tool).

Consumer Price Index 1982-1984 = 100			
1947 = 22.3	1988 = 118.3	1999 = 166.6	2009 = 214.5
1954 = 26.9	1989 = 124.0	2000 = 172.2	2010 = 218.1
1980 = 82.4	1990 = 130.7	2001 = 177.1	2011 = 224.9
1981 = 90.9	1992 = 140.3	2002 = 179.9	2012 = 229.6
1982 = 96.5	1993 = 144.5	2003 = 184.0	2013 = 233.0
1983 = 99.6	1994 = 148.2	2004 = 188.9	2014 = 236.7
1984 = 103.9	1995 = 152.4	2005 = 195.3	2015 = 237.0
1985 = 107.6	1996 = 156.9	2006 = 201.6	2016 = 240.0
1986 = 109.6	1997 = 160.5	2007 = 207.3	2017 = 245.1
1987 = 113.6	1998 = 163.0	2008 = 215.3	2018 = 250.5

Severe Summer Storm Events.

Hurricane damages are included in the Severe Summer Storm Events category considered in this Plan, and not as a separate category due to low occurrence of hurricanes in Knox County, as noted in the rankings portion of this Plan. Worst-case, real-life damages were used to calculate potential damages from hurricanes. The most recent, devastating hurricane to hit Knox County was probably Edna in September 1954.

Edna produced \$7,000,000 in damages to a coastal swath of Maine including Knox County. The hurricane resulted in eight deaths in Maine and power outages. The damage in 2018 dollars would be about \$65,186,000 ($\$7,000,000 \times 250.5$, the CPI for 2018, divided by 26.9, the CPI for 1954). Knox County comprises 6.6% of the population of the affected area. Prorating the damage based on population, Knox County could have \$4,302,000 in damages from a similar hurricane event ($\$65,186,000 \times .066$). The following Hurricanes also caused damage in Maine: Carol 1954, Gloria 1985, Bob 1991, and Floyd 1999, but these hurricanes did not cause recorded damage in Knox County.

The probability that a Category 1 or higher hurricane will strike Maine during the five-year period covered by this Plan update is low. For coastal communities, there will be wind and flooding damages to structures, flooding damages to roads, and downed power lines. For inland communities, damages will be limited to flooding.

Severe Winter Storm Events

Worst-case, real-life damages were used to calculate potential winter storm damages. It was assumed that historic patterns would hold for the future. The ice storm of 1998, which resulted in a Presidential Disaster Declaration, was one of the worst such storms to affect Knox County. The Ice Storm of 1998 resulted in a total of \$48,000,000+ in damages to the State. The Disaster Declaration did not cover damages to power lines and private structures. Using the Consumer Price Index, the \$47.7 million in the disaster declaration damages in 2018 dollars would be \$73,767,000 ($448,000,000 \times 250.5$, the Consumer Price Index for 2018, divided by 163.0, the CPI for 1998). Knox County comprises 3.1% of the population of the 16-county area. Prorating the damage based on population, Knox County could have \$2,287,000 in damages ($73,767,000 \times .031$) from a similar winter storm event distributed equally across the state.

Flooding

Worst-case, real-life damages were used to calculate potential flooding damages, and it was assumed that historic patterns will hold for the future. For Knox County, the worst recorded flooding was the April Fool's Day flood of 1987, which resulted in a Presidential Disaster Declaration of \$100,000,000 in damages to 14 counties.

Using the Consumer Price Index, the damages in 2018 dollars would be \$220,511,000 ($\$100,000,000 \times 250.5$, the CPI for 2018, divided by 113.6, the CPI for 1987). Knox County comprises 3.4% of the population of the 14-county area. Prorating the damage based on population, Knox County could have \$7,497,000 in damages from a similar flooding event ($220,511,000 \times 0.34$).

Wildfire

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 2018 dollars would be about \$337 million (multiply \$30 million by 250.5, which is the consumer price index for 2018, and divide by 22.3, which is the consumer price index 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 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 not high.

The methodology for calculating potential wildfire losses in Knox County is based on the damages that occurred in the 1947 fire in Cumberland, Hancock, Oxford and York Counties. The population of the four counties is 558,900. Divide \$337 million (the 1947 fire in 2018 dollars) by 558,900 to get a per capita cost of \$603. Multiply the County's estimated 2016 population, 39,717, by \$603 to get potential wildfire damages of \$23,949,000..

Given the lack of a major wildfire (defined as 500 acres or larger) in Knox County over the past eight decades and the relatively low-density development in areas prone to wildfires, the real-life worst-case costs of wildfire damages for Knox County over the next five years would probably be lower. Based upon the median housing price for Knox County (\$203,000 in 2017, according to the Maine State Housing Authority), a worst-case cost might be closer to \$3,248,000, which would be the equivalent of the total destruction of 16 detached housing units.

Landslide

The worst-case, real-life damages of a landslide in Knox County were used to calculate potential damages from such erosion. The worst event occurred in Rockland in the spring of 1996. That landslide sent two homes and 300 feet of bluff into the ocean. The clay that made up the bluff sheared into blocks, losing its strength as it collapsed. The damage costs were \$848,000. That cost in 2018 dollars would be \$1,354,000 ($\$848,000 \times 250.5$, the CPI for 2018, divided by 156.9, the CPI for 1996).

C. General description of land uses and development trends

There has been no known change in vulnerability in Knox County over the past five years. Knox County is located along the Downeast coastline of Maine and is largely rural. Land use within Knox County ranges from densely populated urban areas, like downtown Rockland and downtown Camden, to suburban residential areas, to rural areas with farms, and forestland. The largest community in the County is Rockland with a 2016 estimated population of 7,220. 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 allow development to 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.

Municipalities in Knox County have enacted floodplain management, shoreland zoning, and other land use ordinances. Eighteen communities are participants in the National Flood Insurance Program. The Town of Cushing joined 10 July 2013 and Isle au Haut followed on 28 August 2017.

As shown in the table below, Knox County's overall population has changed very little since the year 2000. Since 2010, only six communities experienced growth (Appleton, Matinicus Isle Plantation, North Haven, Rockport, Union and Vinalhaven). All of the other communities have lost population. A clear trend in the County is that nearly all of the residential growth is occurring in the suburban and some rural communities. Declines in a number of communities may be attributed to the loss of local employment opportunities, which forces some to move to larger labor markets outside Knox County, and/or to move to non-coastal areas where housing costs are typically more affordable. The table below documents the rate of growth for all municipalities in Knox County.

Population Growth 1990 – 2017					
Area	1990	2000	2010	2017 ACS Estimates	2010-2017 % Change
Appleton, Town of	1,069	1,271	1,316	1,358	3.2
Camden, Town of	5,060	5,254	4,850	4,837	-0.3
Cushing, Town of	988	1,322	1,534	1,475	-3.8
Friendship, Town of	1,099	1,204	1,152	1,035	-10.2
Hope, Town of	1,017	1,310	1,536	1,522	-9.1
Isle au Haut, Town of	46	79	73	27	-63.0
Matinicus Isle Plantation	67	51	74	81	9.5
North Haven, Town of	332	381	355	540	52.1
Owls Head, Town of	1,574	1,601	1,580	1,559	-1.3
Rockland, City of	7,972	7,609	7,297	7,204	-1.3
Rockport, Town of	2,854	3,209	3,330	3,356	0.8
St. George, Town of	2,261	2,580	2,591	2,583	-0.3
South Thomaston, Town of	1,227	1,416	1,558	1,453	-6.7
Thomaston, Town of	3,306	3,748	2,781	2,767	-0.5
Union, Town of	1,989	2,209	2,259	2,507	11.0
UT (Unorganized Territories)	0	0	7	8	14.3
Vinalhaven, Town of	1,072	1,235	1,165	1,168	0.3
Warren, Town of	3,192	3,794	4,751	4,706	-0.9
Washington, Town of	1,185	1,345	1,527	1,514	-0.9
Knox County	36,310	39,618	39,736	39,700	-0.9

Source: U.S. Census and American Community Survey 5-Year Estimates 2013-2017

Based on population projections prepared by the Maine Department of Administration and Financial Services for organized municipalities and plantations, Knox County is expected to lose population

over the next 5 to 10 years, as summarized in the table below. The only communities that are projected to increase in population over 2010 Census figures by 2021 are Appleton, Hope, Owls Head, Rockport and South Thomaston. All of the remaining communities are projected to experience modest declines. Based on these projections, there is very little likelihood that many new buildings, infrastructure or critical facilities would be vulnerable to the identified hazards.

Projected Population					
Area	2010	2021	2026	2010-2021 % Change	2021-2026 % Change
Appleton, Town of	1316	1,356	1,368	3.0	0.9
Camden, Town of	4850	4,795	4,746	-1.1	-1.0
Cushing, Town of	1534	1,463	1,425	-4.6	-2.6
Friendship, Town of	1152	1,121	1,102	-2.7	-1.7
Hope, Town of	1536	1,800	1,905	17.2	5.8
Isle au Haut, Town of	73	69	66	-5.8	-4.3
Matinicus Isle Plantation	74	71	70	-4.1	-1.4
North Haven, Town of	355	348	343	-2.0	-1.4
Owls Head, Town of	1580	1,603	1,608	1.5	0.3
Rockland, City of	7297	7,053	6,913	-3.3	-2.0
Rockport, Town of	3330	3,394	3,412	1.9	0.5
St. George, Town of	2591	2,563	2,535	-1.1	-1.1
South Thomaston, Town of	1558	1,642	1,669	5.4	1.6
Thomaston, Town of	2781	2,744	2,714	-1.3	-1.1
Union, Town of	2259	2,183	2,138	-3.4	-2.1
UT (Unorganized Territories)	7	6	6	-14.2	0
Vinalhaven, Town of	1165	1,112	1,084	-4.5	-2.5
Warren, Town of	4751	4,613	4,528	-2.9	-1.8
Washington, Town of	1527	1,494	1,470	-2.2	-1.6
Knox County	39,736	39,430	39,102	-0.8	-0.8

Source: 2010 U.S. Census and Maine Department of Administration and Financial Services

Housing growth has occurred at a faster rate than the growth in population. This is due to the construction of vacation/second homes that are used seasonally, whose residents are not included in the year round population figures. As well, a notable decrease in average household size has occurred over the past twenty years. This decrease is due to the in-migration of retiree-aged households, empty nesters, families headed by single parents, and reduced birth rates, among other causes. Between 2000 and 2010, the largest increases in housing stock have occurred in St. George, Camden, Rockport and Warren.

Housing Unit Growth 1990 – 2010					
Area	1990	2000	2010	# Change 2000-2010	%Change 2000-2010
Appleton, Town of	450	547	646	99	18.1
Camden, Town of	2,654	2,883	3,165	282	9.8
Cushing, Town of	602	778	926	148	19.0
Friendship, Town of	818	849	896	47	5.5
Hope, Town of	542	687	805	118	17.2
Isle au Haut, Town of	136	164	172	8	4.9
Matinicus Isle Plantation	101	135	147	12	8.9
North Haven, Town of	441	488	515	27	5.5

Housing Unit Growth 1990 – 2010					
Area	1990	2000	2010	# Change 2000-2010	%Change 2000-2010
Owls Head, Town of	909	992	1,060	68	6.9
Rockland, City of	3,719	3,752	3,925	173	4.6
Rockport, Town of	1,409	1,677	1,956	279	16.6
St. George, Town of	1,567	1,777	2,107	330	18.6
South Thomaston, Town of	697	804	893	89	11.1
Thomaston, Town of	1,212	1,535	1,385	-150	-9.8
Union, Town of	878	1,052	1,203	151	14.6
UT (Unorganized Territories)	52	67	91	24	35.8
Vinalhaven, Town of	1,038	1,228	1,295	67	5.5
Warren, Town of	1,277	1,534	1,760	226	14.7
Washington, Town of	532	694	797	103	14.8
Knox County	19,009	21,612	23,744	2,132	9.9

Source: U.S. Census

Natural disasters including storms and flooding can temporarily close businesses, which results in a loss of income and economic activity. Most major employers and employment opportunities are located in the service centers of Rockland, Camden, Rockport, and Thomaston, and are generally on or near US Route 1.

The economy of Knox County generally reflects that of the State as a whole, at least in terms of private employment by major industry sector, as shown in the table below. Within Knox County, employment in most of the sectors is within a percentage point or two of State employment figures. The exceptions include wholesale trade (Knox 1.8%, Maine 4.0%), retail trade (Knox 19.7%, Maine 16.2%), and professional and business services (Knox 10.3%, Maine 12.9%).

Knox County Covered Private Employers and Employment March, 2016					
Sector	Knox Co. Covered Employers	Covered Employment			
		Knox Co		Maine	
		#	%	#	%
Natural resources and mining	126	287	2.1	5,724	1.9
Construction	211	839	6.1	24,337	5.0
Manufacturing	96	1,669	12.1	49,570	10.3
Wholesale trade	84	255	1.8	19,301	4.0
Retail trade	253	2,719	19.7	78,489	16.2
Transportation, warehousing	49	292	2.1	15,186	3.1
Utilities	6	64	0.5	1,668	0.3
Information	34	286	2.1	7,461	1.5
Financial services	118	646	4.7	28,850	6.0
Professional and business services	287	1,420	10.3	62,293	12.9
Educational services	32	188	1.4	13,033	2.7
Health care social assistance	150	2,770	20.0	103,718	21.5
Leisure and hospitality	232	1,682	12.2	54,899	11.4
Other/unclassified	179	704	5.1	19,003	3.9
Total	1857	13,821	100.2	483,532	100.7

Source: Maine Department of Labor

iii. Multi-jurisdictional Risk Assessment

As previously stated, the following are hazards for which all areas of the County are subject to the same general risk:

- Flooding
- Severe summer storm events
- Severe winter and storm events
- Wildfires in urban interface areas (Although most areas are at risk from wildfires, it is the less densely developed areas of the smaller communities that face forest acreage losses. This is due to the lack of adequate roads for providing emergency services. In addition, the resources of municipal fire departments for fighting wildfires are extremely limited, due to the small population base and the fact that most firefighters are volunteers.)

Coastal flooding affects limited portions of the coastal communities of Camden, Cushing, Friendship, Isle Au Haut, North Haven, Owls Head, Rockland, Rockport, St. George, South Thomaston, and Vinalhaven. The State of Maine Ferry Terminal at Rockland that serves the islands of North Haven, Vinalhaven and Matinicus Isle Plantation could be impacted by coastal flooding, as could the island ferry facilities.

SECTION 5 MITIGATION STRATEGIES

Mitigation Strategy	
<p>Requirement: §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"> (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. (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. (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. (iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan. 	
Element	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?
	C2: Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?
	C3: Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?
	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?
	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?
	D2: Was the plan revised to reflect progress in local mitigation efforts? See Maintenance Section
	D3: Was the plan revised to reflect changes in priorities? See Maintenance Section

C1. Existing Authorities, Policies, Programs and Resources

On page 5 - 3 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:** Some towns in Knox County have a town manager, others have an administrator whose duties may vary from those of a town manager, In the table below, “MGR” indicates town manager; “A” indicates administrator.
- **Board of Selectmen or Board of Assessors:** If a town 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 towns in Knox County with staff resources devoted exclusively to hazard mitigation.
- **Public Works Director or Road Commissioner:** Some of the larger towns have a public works director, but most have a road commissioner. The road commissioner might also be the town manager or member(s) of the board of selectmen.
- **Flood Hazard Ordinance:** All of the towns in Knox County are in the Flood Insurance Program and 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 the towns in Knox 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 Knox County’s portion of the Unorganized Territory 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. Hazard Mitigation Assistance Guidance for the *Hazard Mitigation Grant Program (sec 404 & 406)*, *Pre-Disaster Mitigation*, and the *Flood Mitigation Assistance* grant programs can be found here www.fema.gov/hazard-mitigation-assistance.

All jurisdictions in Knox County could expand and improve their existing capabilities if additional funds, 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

“MGR” – Town or City Manager

“A” - Administrator

“AA” – Assessors/Annual Town Meeting

“LUPC” – Maine Land Use Planning Commission

“ST” – Selectmen/Town Meeting form of government

“M” – Mayor

“C” - Council

Blank – not applicable

Authorities, Policies, Programs and Resources Available to Accomplish Hazard Mitigation							
Town	Town or City Manager	Staff involved in Local Planning	Public Works or Road Commissioner	EMA Director	Flood Hazard Ordinance	Shoreland Zoning Ordinance	Form of Government
Appleton			X	X	X	X	ST
Camden	MGR	X	X	X	X	X	ST,MGR
Cushing			X	X	X	X	ST
Friendship			X	X	X	X	ST
Hope			X	X	X	X	ST
Isle au Haut			X	X	X	X	ST
Matinicus Isle Plantation			X	X	LUPC	LUPC	AA
North Haven	A		X	X	X	X	ST,A
Owls Head			X	X	X	X	ST
Rockland	MGR,M	X	X	X	X	X	C,M,MGR
Rockport	MGR	X	X	X	X	X	ST,MGR
St. George	MGR		X	X	X	X	ST,MGR
South Thomaston	A		X	X	X	X	ST,A
Thomaston	MGR		X	X	X	X	ST,MGR
Union	MGR		X	X	X	X	ST,MGR
Unorganized	County Commission	X		X	LUPC	LUPC	LUPC
Vinalhaven	MGR		X	X	X	X	ST,MGR
Warren	MGR		X	X	X	X	ST,MGR
Washington			X	X	X	X	ST

Source: Maine Municipal Association Directory, 2017-2018, Knox County EMA 2019

C2. Participation in the NFIP National Flood Insurance Program

As shown in the table below, all of the municipalities in Knox County 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.

All the townships in Knox County's portion of Maine's Unorganized Territory are under the jurisdiction of Maine's Land Use Planning Commission (LUPC). LUPC has agreed to administer and enforce the NFIP for all plantations and townships that are under its control and has modified its requirements to include floodplain management regulations. The table below summarizes the participation of Knox County municipalities in the NFIP.

Key to Table

FHBM: Flood Hazard Boundary Map

FIRM: Flood Insurance Rate Map

Knox County Communities Participating in the NFIP					
Town	Initial FHBM ¹	Initial FIRM ¹	Current Effective Map Date ¹	Regular-Emergency Date ¹	Adoption and Enforcement ²
Appleton	8-2-74	12-4-85	7-6-16	12-4-85	X
Camden	5-31-74	5-4-88	7-6-16	5-4-88	X
Cushing	1-3-75	7-16-90	7-6-16	7-16-90	X
Friendship	1-3-75	7-16-90	7-6-16	7-16-90	X
Hope	2-21-75	2-19-86	7-6-16	2-19-86	X
Isle au Haut	-	7-6-16	7-6-16	8-28-17	X
Matinicus Isle Plt.	-	7-6-16	7-6-16	4-30-84	X
North Haven	2-28-75	7-16-91	7-6-16	7-16-91	X
Owls Head	9-13-74	6-19-89	7-6-16	6-19-89	X
Rockland	11-8-74	1-5-89	7-6-16	1-5-89	X
Rockport	9-20-74	5-4-89	7-6-16	5-4-89	X
St. George	1-24-75	9-1-89	7-6-16	9-1-89	X
South Thomaston	11-1-74	5-17-89	7-6-16	5-17-89	X
Thomaston	9-6-74	12-4-85	7-6-16	12-4-85	X
Union	9-20-74	3-18-87	7-6-16	3-18-87	X
Unorganized	-	7-6-16	7-6-16	4-30-84	X
Vinalhaven	4-18-75	3-1-87	7-6-16	3-1-87	X
Warren	9-6-74	4-17-85	7-6-16	4-17-85	X
Washington	9-6-74	3-1-04	7-6-16	3-1-04	X

¹ Source: FEMA Community Status Book Report as of 24 January, 2019

² 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). Knox County EMA is not aware of any new construction in the SFHA.

C3. Goals

The Hazard Mitigation Planning Team reviewed the goals contained in the 2012 Hazard Mitigation Plan and determined that these goals should continue to guide this Hazard Mitigation Plan - 2019 Update. The goals relate to the hazards profiled in this plan and include the following:

Severe Summer Storms: Reduce loss of life, injury, and property damage in Knox County caused by severe summer storm events (including hurricanes and coastal erosion resulting from severe storm events).

Severe Winter Storms: Reduce loss of life, injury, and property damage in Knox County caused by severe winter storm events.

Flooding: Reduce loss of life, injury, and property damage in Knox County caused by flooding.

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

Landslides: Reduce damage, injury, and loss of life in Knox County caused by landslides.

C4. Comprehensive Range of Specific Actions and Projects

Addressed in the format of the County Actions table below and in the table of projects by municipality beginning on page 5-13.

C5. Action plan

Addressed in the format of the County Actions table below and in the table of projects by municipality beginning on page 5-13.

COUNTY-WIDE GOALS AND MITIGATION ACTIONS

The Knox County Planning Team identified and analyzed a number of hazard mitigation measures that would benefit the County. As previously noted in the Planning Section, these measures were identified through workshops, during meetings with the elected and appointed public officials, through outreach to the towns and with the Commissioners who represent the Unorganized Territory.

Note:

- A new column, Timeframe, has been added in accordance with FEMA guidelines.
- The designation “2019-2024” in the timeframe column indicates that the action does not have a specific beginning and end date (such as a construction project), but is rather a recurring action that cannot be pinpointed to a specific date or dates. In it are actions that will depend on circumstances which cannot be predicted in advance, such as a flooding threat, rapid snowmelt, or thunderstorm activity. The recurring action can occur at any time during the 5-year period covered by this plan.
- Other actions have been modified to emphasize a County action.
- **Funding.** The major sources of funding for the County actions are financial support for the operation of Knox County EMA (County taxes, FEMA EMPG grants, Homeland Security funds, matching funds provided by time spent by local officials on hazard mitigation).

SEVERE SUMMER STORM EVENTS

The most likely damages caused by a severe summer storm event are the loss of electrical power from downed power transmission lines, the blockage of roads from tree debris, wash-outs caused by water runoff that overwhelms local drainage systems, and erosion resulting from wave action or river flow. There could be injuries or loss of life caused by delayed responses from emergency services, debris falling on an individual, or from storm-related vehicle accidents resulting from downed tree limbs, and road washouts, or erosion. Other types of general damage to personal and real property may be caused by high winds, like those from a hurricane. If power is lost for extended periods of time, severe storm events can shut down businesses, resulting in major losses of income to local businesses and individuals. In fact, the very presence of a coastal storm will shut commerce down, resulting in major losses of income for local businesses.

Goal: Reduce loss of life, injury, and property damage in Knox County caused by severe summer storm events (including hurricanes and coastal erosion resulting from severe storm events).

Activities	Responsibility	Timeline	Status/Rationale if no Action
<p>A. Section 406 Funding. When appropriate, maximize the use of 406 funds through the Public Assistance (PA) Program.</p> <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 a 15% share, and the community pays 10%, this lessens the local financial burden after a disaster for infrastructure protection and improvement.</p>	Knox County EMA /Municipal Officials	2019-2024 As 406 funds become available	New
<p>B. Public Education. Continue to work with the media for public service announcements on hazard mitigation topics, and include hazard mitigation information on municipal, or county EMA websites and social media outlets.</p>	Knox County EMA /Municipal Officials	2019-2024 as Needed	New. Extensive social media alerting use; watches, warnings and advisories posted to County website in the “weather” section; updated as needed.
<p>C. Infrastructure Protection. Continue to 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 continually ebb and flow, information exchange is critical to keeping current officials up to date.</p>	Knox County EMA	2019-2024 as opportunities arise	New

Activities	Responsibility	Timeline	Status/Rationale if no Action
<p>D. Generators. Assist interested municipalities in applying for fire or mitigation grant funds for generators at all critical facilities that are not in flood hazard areas.</p> <p>Analysis: As of a FEMA policy change in 2012, generators for critical facilities are eligible for mitigation funding. Generators can ensure the proper functioning of critical facilities during emergencies, thus making the whole community more resilient.</p>	Knox County EMA	2019-2024	New. 7 generators purchased to date; other projects deferred until further funding becomes available.
<p>E. Road Repair Records. Encourage municipalities to maintain road damage repair records, and seek guidance on hydrology and roadway engineering and design, which may include Stormwater Analysis and Management Plans.</p>	Knox County EMA Municipal officials	2019-2024 as needed	Knox County holds periodic workshops on tracking road repair costs
<p>F. Mitigation Grants. Apply for grants to upgrade roads, culverts, ditches, and drainage systems in accordance with plans for making roads safe from summer storms and water runoff.</p>	Knox County EMA Municipal officials	2019-2024 as needed	Lack of complete historical records has made this difficult in meeting BCA; use of the Road System Maintenance Software (RSMS) will help in building better databases.
<p>G. Flood Insurance. Continue to encourage homeowners to purchase insurance for severe storm damages.</p>	Knox County EMA Municipal officials	2019-2024 as needed	This is an ongoing topic at Knox County EMA workshops and occasional public service announcements
<p>H. Requirements for Generators.-Develop/update policies to require new or existing critical public facilities to have a generator.</p>	Municipal officials		Some towns have embraced this idea; others will consider pending funding availability.

SEVERE WINTER STORM EVENTS

The most likely damages caused by a severe winter storm event are the loss of electrical power from downed power transmission lines, the blockage of roads from tree debris, wash-outs caused by ice jams and water runoff that overwhelms local drainage systems, and erosion resulting from wave action or river flow. There could be injuries or loss of life caused by delayed responses from emergency services, the improper use of back-up heat sources, freezing conditions, debris falling on an individual, or from storm-related vehicle accidents resulting from downed tree limbs, road washouts, erosion, or icy conditions. Other types of general damage to personal and real property may be caused by high winds, like those from a blizzard. If power is lost for extended periods of time, severe storm events can shut down businesses, resulting in major losses of income to local businesses and individuals. In fact, the very presence of a blizzard or winter coastal storm will shut commerce down, resulting in major losses of income for local businesses.

Goal: Reduce loss of life, injury, and property damage in Knox County caused by severe winter storm events.

Activities	Responsibility	Timeline	Status/Rationale if no Action
<p>A. Section 406 Funding. When appropriate, maximize the use of 406 funds through the Public Assistance (PA) Program.</p> <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 a 15% share, and the community pays 10%, this lessens the local financial burden after a disaster for infrastructure protection and improvement.</p>	Knox County EMA /Municipal Officials	2019-2024 As 406 funds become available	New
<p>B. Public Education. Continue to work with the media for public service announcements on hazard mitigation topics, and include hazard mitigation information on municipal, or county EMA websites and social media outlets.</p>	Knox County EMA/ Municipal Officials	2019-2024 as needed	New. Extensive social media alerting use; watches, warnings and advisories posted to County website in the “weather” section; updated as needed.
<p>C. Infrastructure Protection. Continue to 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 continually ebb and flow, information exchange is critical to keeping current officials up to date.</p>	Knox County EMA	2019-2024 as opportunities arise	New

Activities	Responsibility	Timeline	Status/Rationale if no Action
<p>D. Generators. Assist interested municipalities in applying for fire or mitigation grant funds for generators at all critical facilities that are not in flood hazard areas.</p> <p>Analysis: As of a FEMA policy change in 2012, generators for critical facilities are eligible for mitigation funding. Generators can ensure the proper functioning of critical facilities during emergencies, thus making the whole community more resilient.</p>	Knox County EMA	2019-2024	New. 7 generators purchased to date; other projects deferred until further funding becomes available.
<p>E. Mitigation Grants. Apply for grants to upgrade roads, culverts, ditches, and drainage systems in accordance with plans for making roads safe from summer storms and water runoff.</p>	Knox County EMA Municipal officials	2019-2024 as needed	Lack of complete historical records has made this difficult in meeting BCA; use of the Road System Maintenance Software (RSMS) will help in building better databases.
<p>F. Flood Insurance. Encourage homeowners to purchase insurance for severe storm damages.</p>	Municipal officials County	2019-2024 as needed	This is an ongoing topic at Knox County EMA workshops and in occasional public service announcements
<p>G. Requirement for Generators. Develop/update policy to require new or existing critical public facilities to have a generator.</p>	Municipal officials	2019-2024 as needed	Some towns have embraced this idea; others will consider pending funding availability.

FLOODING. In Knox County, flooding is most often associated with the effects of severe summer storms, ice and snow build-up, and spring run-off. The most likely damages resulting from flooding are the destruction of roads caused by washouts and undercutting. Most communities that have flooding issues have joined the National Flood Insurance Program and are controlling future development through the enforcement of local flood hazard ordinances.

Goal: Reduce loss of life, injury, and property damage in Knox County caused by flooding.

Activities	Responsibility	Timeline	Status/Rational if no Action
<p>A. DAM EAP Plans. Monitor the preparation of Emergency Action Plans (EAPs) for High and Significant Hazard dams, assist with exercises, review the results of dam inspections by the Maine State Dam Engineer.</p>	County EMA Director Dam owners Local EMA directors	2019-2024 as needed	All Dam EAPs current as of - Feb 2019

Activities	Responsibility	Timeline	Status/Rational if no Action
B. Map Education. Improve knowledge of flood insurance rate maps among citizens; offer simple “ <i>what’s my risk</i> ” and “ <i>should I evacuate</i> ” mapping applications	County EMA Director, Municipalities	2019-2024 as needed	Local level maps DFIRMS provided; applications developed
C. NFIP Participation. Encourage participation in the flood insurance program, as well as actions needed to ensure continued municipal compliance with NFIP program. Encourage municipal Community Rating System (CRS) upgrades	County EMA Director, Local municipal officials, State Officials, MEMA,	2019-2024 as opportunities arise	Addressed in EMA Directors’ meetings and NFIP information included on County EMA website
D. Local NFIP Enforcement. Implement and enforce local floodplain management ordinances to minimize future flood losses caused by new construction.	Code Enforcement Officers Planning Boards	2019-2024 as needed	Based on available information, municipalities continue to administer and enforce their floodplain management ordinances.
E. Property Mitigation. Encourage homeowners in flood zones to mitigate their properties.	Municipalities Local EMA directors	2019-2024 as opportunities arise	FEMA/NFIP handout materials available online, in town offices and at public education events.
F. Road Repair Records. Encourage municipalities to maintain road damage repair records, seek guidance on hydrology and roadway design, which may include Stormwater Analysis and Management Plans.	Knox County EMA Municipalities	2019-2024 as opportunities arise	Use of RSMS encouraged and supported by County EMA. Coastal Communities grants available and used. County participating in coastal resiliency grant with Island Institute. Improved risk awareness. Some planning done.
G. 406 Funding. Maximize the use of 406 funds through the Public Assistance (PA) Program. 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 a 15% share, and the community pays 10%, this lessens the local financial burden after a disaster for infrastructure protection and improvement.	Knox County EMA	2019-2024 As 406 funds become available	New
H. Infrastructure Protection. Inform local officials of training exercises, technical assistance and potential funding opportunities aimed at infrastructure protection. Analysis: Since there is constant turnover of public officials, and funding resources continually ebb and flow, information exchange is critical to keeping current officials up to date.	Knox County EMA	2019-2024 as opportunities arise	New

WILDFIRE. All parts of Knox County are subject to wildfires/wildland fires in the urban interface, however the northern portion of the county has the least accessibility to the productive forestland due to the lack of roads and development, and the coastal portion of the County has a larger number of homes and businesses within urban interface. The impacts of wildfires include the destruction of woodland forest stands of trees and other vegetation, which when located on steep slopes and/or near watercourses can increase erosion and pollution to water bodies. Loss of income from timber harvesting can occur from wildfires. Although uncommon in Knox County, structures including residences can be damaged or destroyed from wildfires. Temporary road closures may occur when wildfires are close to roadways or cross over roadways.

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

Activities	Responsibility	Timeline	Status/Rationale if no Action
<p>A. Public Education. Notify local officials of fire prevention workshops offered by the Maine Forest Service (MFS). Include fire prevention information on the EMA website.</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 to individual consultations on methods for reducing potential damages from wildfires.</p>	Knox County EMA	2019-2024 as needed	New
<p>B. Building Codes. Introduce building codes requiring fire-retardant roofing and siding materials.</p>	Municipal officials	2019-2024 as opportunities arise	Continue as needed
<p>C. Homeowner Tactics. Educate homeowners on tactics to protect their homes from wildfires.</p>	Code Enforcement Officers Municipal officials	2019-2024 as opportunities arise	Continue support and promotion of Maine Forest Service (MFS) "Defensible Space and Fuel Reduction Program" (Appendix D) See also A, above
<p>D. Island Fire Load. Encourage island communities to seek opportunities to reduce wildland fire load from tree blow-downs and slash; improve fire breaks where possible.</p>	Municipal officials Maine Forest Service Maine LUPC	2019-2024 as opportunities arise	Lack of funding and mitigation costs are prohibitive
<p>E. Fire Ponds. Encourage the construction of Fire Ponds by private landowners in non-hydrant districts.</p>	Municipal officials	2019-2024 as opportunities arise	Municipalities conducting hydrogeological studies of fire pond for ISO rating upgrades
<p>F. Access Roads, Logging Roads. Encourage private landowners to cut back tree growth along access drives, woods and logging roads.</p>	Municipal officials	2019-2024 as opportunities arise	Includes support and promotion of Maine Forest Service (MFS) "Defensible Space and Fuel Reduction Program" Appendix D)
<p>G. Bulk Slash Reduction. Encourage bulk slash reduction through good Forestry Best Management Practices (BMPs).</p>	Municipal officials	2019-2024 as opportunities arise	Not known if steps taken

LANDSLIDE. Landslides are uncommon in Knox County, although several have occurred. Unstable coastal bluffs in excess of 20 feet in height will likely be subject to landslides on a more frequent basis as a result of severe storms, flooding and sea level rise. Coastal bluff stability maps are included in this plan and show areas where a landslide potential exists. The impacts of landslides include the damage or destruction of structures located in landslide prone areas, the potential for injury and loss of life, as well as damage to public infrastructure including roadways and utility lines. Roads are vulnerable to temporary closure when landslides are nearby or cross roadways. If the landslide includes the roadway itself, the closures may be longer term as reconstruction and realignment efforts are undertaken.

Goal: Reduce damage, injury, and loss of life in Knox County caused by landslides.

Activities	Responsibility	Timeline	Status/Rationale if no Action
A. Shoreland Zoning. Encourage enforcement of State-mandated shoreland zoning provisions that restrict future development in landslide prone areas.	Municipal officials Code Enforcement Officers	2019-2024 as opportunities arise	Based on available information, municipalities are enforcing shoreland zoning ordinances
B. Homeowner Education. Educate homeowners on tactics to protect their homes or development sites from landslides, including the use of shoreland stabilization, riprap, and re-grading where state law allows such mitigation.	Code Enforcement Officers Municipal officials	2019-2024 as opportunities arise	This is an ongoing topic at Knox County EMA workshops and in occasional public service announcements

Rating of Actions and Establishment of Priorities

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

1. Life and property
2. Percent of population benefited
3. Probability of community acceptance
4. Probability of funding
5. Feasibility of implementation

On a scale of 1-3, each criterion was rated with one being the lowest rating and three being the highest to add up to a total score. Where two or more actions have the same rating, the actions are considered to have equal importance.

Rating of Severe Summer Storm Mitigation Actions						
	Life/ Property	% of Population Benefited	Probability Community Acceptance	Probability of Funding	Feasibility of Implementation	Total Score
A. 406 Funding	2	3	3	3	3	14
B. Public Education	1	1	3	3	3	11
C. Infrastructure Protection	3	3	3	1	1	11
D. Generators	3	2	3	3	3	14
E. Road Repair Records	3	3	3	1	3	13
F. Mitigation Grants	2	3	3	1	2	11
G. Flood Insurance	3	1	1	1	3	9
H. Requirements for Generators	1	1	1	1	3	7

Rating of Severe Winter Storm Mitigation Actions						
	Life/ Property	% of Population Benefited	Probability Community Acceptance	Probability of Funding	Feasibility of Implementation	Total Score
A. 406 Funding	2	3	3	3	3	14
B. Public Education	1	1	3	3	3	11
C. Infrastructure Protection	3	3	3	1	1	11
D. Generators	3	2	3	3	3	14

E. Mitigation Grants	2	3	3	1	2	11
F. Flood Insurance	1	1	3	1	3	9
G. Requirements for Generators	3	1	1	1	2	8

Rating of Flooding Mitigation Actions						
	Life/ Property	% of Population Benefited	Probability Community Acceptance	Probability of Funding	Feasibility of Implementation	Total Score
A. DAM EAP Plans	3	1	3	1	2	10
B. Map Education	1	1	2	1	2	7
C. NFIP Participation	3	1	2	1	1	8
D. Local NFIP Enforcement	3	1	1	1	1	7
E. Property Mitigation	3	1	3	1	1	9
F. Road Repair Records	3	3	3	1	3	13
G. 406 Funding	2	3	3	3	3	14
H. Infrastructure Protection	3	3	3	1	1	11

Rating of Wildfire Mitigation Actions						
	Life/ Property	% of Population Benefited	Probability Community Acceptance	Probability of Funding	Feasibility of Implementation	Total Score
A. Public Education	3	2	3	3	3	14
B. Building Codes	2	2	1	3	3	11
C. Homeowner Tactics	2	2	3	1	1	9
D. Island Fire Load	3	3	1	1	1	9
E. Fire Ponds	3	3	3	1	1	11
F. Access Roads, Logging Roads	3	3	3	1	1	11
G. Bulk Slash Reduction	2	1	3	1	1	8

Rating of Landslide Mitigation Actions						
	Life/ Property	% of Population Benefited	Probability Community Acceptance	Probability of Funding	Feasibility of Implementation	Total Score
A. Shoreland Zoning	1	1	2	1	1	6
B. Homeowner Education	2	1	2	2	3	10

Prioritized Mitigation Projects in Knox County

Note: The projects included in the Hazard Mitigation Projects by Municipality tables were largely developed with EMA staff working directly with specific municipalities in this county.

Mitigation Projects listed in priority order. Knox County's Hazard Mitigation Plan encompasses 1 city, 16 towns, 1 plantation, and its portion of the Unorganized Territory. Most municipalities in the County identified one or more mitigation projects consistent with the countywide goals, and activities, to mitigate hazards at the local level. The jurisdictions, as well as the specific mitigation projects they will pursue, are listed in priority order in the table on page 5-17. The timeframes shown are based upon acceptance of the project by FEMA and / or the availability of materials and funding. The major change in this part of the update is that the old projects, which were very generic, have been replaced with specific, measureable projects.

Criteria for prioritization – Towns: The list of local mitigation projects was developed and prioritized separately by each municipality. Local officials did not use formal, written criteria for the identification of local projects. Local mitigation officials relied on common sense, local knowledge of the frequency and extent of local damages, local knowledge of which projects were of the highest priority, 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.

Criteria for prioritization – County-wide: See previous tables beginning on page 5-13.

How the actions will be implemented. The Hazard Mitigation Projects by Municipality tables identify one or more parties who will be responsible for implementation.

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

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

of government. Therefore, for all of the reasons stated above, projects with the status “Deferred – lack of funds” may have to be carried over to the next planning cycle.

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

Potential Funding Sources.

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

- Local tax money
- Maine DOT local road assistance funds
- FEMA Hazard Mitigation Assistance (HMA) grant funds
- 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.

Note: References to culverts on the following pages refer to upsizing or lengthening culverts, unless otherwise stated. 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.

Use of a cost-benefit analysis. Many of the jurisdictions included in this Plan are small towns run by part time staff and / or volunteers. 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 through regular and special meetings. This review is at least equal to a formal benefit-cost calculation because each expenditure item will be carefully scrutinized rather than simply being plugged into a formula. Furthermore, 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.

Status of completed, deleted or deferred projects. The Hazard Mitigation Projects by Municipality tables contain a status column that identifies the completed, deleted or deferred mitigation projects. For deferred projects, the “status” column lists the reason or reasons that no changes occurred.

Hazard Mitigation Projects by Municipality

Goal: Benefit cost analysis

Prior to grant application development, projects will have their cost effectiveness determined by use of the FEMA BCA module. MEMA will provide technical assistance as part of this process. Strategies for hazard mitigation within the County were identified to reduce overall damage in the County, including damage to new and existing buildings and new and existing infrastructure. Although these strategies are aimed at reducing overall damage in the County, each jurisdiction will be responsible for pursuing the actions that are relevant to that jurisdiction. The jurisdictions, along with the specific actions they will pursue, are listed as follows:

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Appleton, Town of	(1) Peabody Rd: Ditch 1,000' and add (1) 18" x 40' HDPE culvert.	44.29391/-69.22495	\$4,500	Short Term	Road commissioner	In planning phase
	(2) Improve drainage, upsize culvert projects as needed	Various Locations	\$3,000-10,000	Long Term	Road Commissioner	New – deferred pending funding
Camden, Town of	(1.a) Update flood profiles for the Megunticook River drainage basin and determine flow capacity at Various sites prone to flooding	44.223444/-69.079599	\$50,000 estimate	Short Term	Town Manager (TM) Planning & Dev Director (PDD)	Pending
	(1.b) Determine flood risk impact of Knox Mill Dam, Knowlton Dam, and one additional abandoned barrier		\$50,000	Short Term	TM and PDD	Pending
	(1.c) Evaluate dams for removal		\$200,000	Short Term	TM and PDD	Pending
	(1.d) Assess options for reducing flood hazards associated with privately owned dams on the Megunticook River		\$50,000	Short Term	TM and PDD	Pending

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Camden, Town of	(1.e) Evaluate discrepancies in published reports on the downstream damage likely to occur in the event of breach of Knox Mill Dam	44.223444/ -69.079599	\$25,000	Short Term	TM and PDD	Pending
	(1.f) Evaluate options for making Megunticook East and West dams more resilient.		\$50,000	Short Term	TM and PDD	Pending
	(2.a) Evaluate Route 1 Bridge over Megunticook River for flood resiliency	44.21055/ -69.06433	\$25,000	Short Term	TM and PDD	Pending
	(2.b) implement recommendations of Montgomery Dam Feasibility Study		\$2,000,000	Short Term	TM and PDD	Pending
	(2.c) Redesign of sea wall at Harbor Park to be more resilient and less susceptible to frequent overtopping during high tide events		\$100,000	Short Term	TM and PDD	Pending
	(3) Public Landing and infrastructure redesign in preparation for sea level rise and increased flooding	44.20973/ -69.06326	\$250,000	Short Term	TM and PDD	Pending
	(4) Curtis Avenue; replace rotted and heaved storm drain and extend	44.202099/ -69.071811	\$125,000	Short Term	Public Works	Planned FY-21 Pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Camden, Town of	(5) Park Street; replace existing deteriorating storm drain	44.20503/-69.07274	\$125,000	Short Term	Public Works	Planned FY-20 pending funding
	(6) Improve drainage and upsize culvert as needed	Various Locations	\$3,000 - 10,000	Long Term	Public Works	Deferred – pending funding
	(7) Evaluate Wildland Fire Hazard/WUI Study – Curtis Island	44.20192/-69.04996	\$10,000	Short Term	Fire Chief/ME Forestry	Pending
	(8) Evaluate Wildland Fire Hazard/WUI Study – Ragged Mountain	44.21433/-69.14533	\$10,000	Short Term	Fire Chief/ME Forestry	Pending
	(9) Evaluate Wildland Fire Hazard/WUI Study – Camden Hills State Park & Mt. Battie	44.24482/-69.06362	\$10,000	Short Term	Fire Chief/ME Bureau of Parks & Lands	Pending
	(10) Jacobs Ave: Upsize, lengthen and realign existing twin 24" x 40' with 2' x 4' 50' box culvert or according to H&H study and repave, stabilize stream bank 100' x 3'		\$35,000	N/A	Public Works	Completed
	(11) Melvin Heights: replace large rotted cross culvert		\$50,000	N/A	Public Works	Completed
	(12) Spruce Street: replace storm drain and rebuild road		\$124,000	N/A	Public Works	Completed

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Camden, Town of	(13) Rollins Road: Ditching, box culvert installation		\$40,000	N/A	Public Works	Completed
Cushing, Town of	(1) Salt Pond Road: Elevate 180' x 21' x 3' on average, upsize 18" x 40' CMP with 24" x 50' HDPE and repave.	43.997496/-69.287693	\$50,000	Long Term	Road commissioner	In planning phase- Pending funding
	(2) Improve drainage and upsize culvert projects as necessary	Various Locations	\$3,000-\$10,000	Long Term	Road Commissioner	deferred pending funding
Friendship, Town of	(1) Town Wharf: (Phase 1) Replace piles and (Phase 2) re-deck wharf 60' x 16'.	43.97281/-69.33701	\$7,000	Short Term	Road commissioner	Phase 1 Complete Phase 2 Deferred, pending funding
	(2) Martins Point Town Landing: Extend cement boat ramp an additional 60 ' and add geo-textile honeycomb chambers, backfill with crushed stone and/or concrete. (Note: first 30 feet of project funded and completed)	43.97967/-69.35247	\$28,000	Medium Term	Road commissioner	Partially completed. Deferred pending funding.
	(3) Friendship Long Island Town Road; selective wildland timber fuel reduction/fire break. Road drainage improvements	43.96271/-69.33825	\$55,000	Long Term	Road Commissioner	Deferred; pending funding
	(4) Ditching and Erosion Control for Harbor Rd and Timber Rd	43.97934/-69.33754 & 44.00782/-69.34941	\$8,000	Short Term	Road commissioner	Deferred; pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Friendship, Town of	(5) Improve drainage and upsize culverts as necessary	Various Locations	\$3,500 - \$11,000	Long Term	Road Commissioner	Deferred pending funding
Hope, Town of	(1) Access facility. Procure & Install Generator and ancillary equipment at municipal shelter Hope Elementary School	44.223903/-69.223499	\$50,000	Long Term	EMA Director/School Committee/Select Board	New. Deferred pending funding
	(2) Gillette Rd/ Crabtree Rd: Upsize and lengthen (8) 15" x 40' CMP to 18" x 45' and (6) 24" x 40' CMP to 24" x 50' HDPE, riprap intake and outlets.		\$40,000	N/A	Road commissioner	Completed
	(3) Improve drainage and upsize culverts as necessary	Various Locations	\$3,000 - \$10,000	Long Term	Road Commissioner	pending funding
Isle Au Haut, Town of	(1) Loop Road at Pats Brook: Add (3) 18" x 40' HDPE culverts and elevate 200' x 20' x 2' on average.	44.05205/-68.60759	\$27,000	Medium Term	Road commissioner	In planning phase
	(2) Loop Road at Town Brook Add 4' x 30' squash culvert.	44.05657/-68.64315	\$6,000	Short Term	Road commissioner	In planning phase
	(3) Riches Cove Brook: Upsize to 4' x 40' squash culvert and riprap intake and outlet.	44.07720/-68.60606	\$7,000	Short Term	Road commissioner	In planning phase
	(4) Pond Lookout Road: Install 4' x 5' x 30' bottomless box culvert and riprap intake and outlet.	44.08378/-68.62644	\$40,000	Medium Term	Road commissioner	In planning phase
	(5) Loop Road at Duck Harbor Cross Rd: Add 24" x 30' relief culvert.	44.02417/-68.61917	\$2,500	Short Term	Road commissioner	In planning phase
	(6) Eastern Head Road: Add 30" x 20' culvert.	44.02563/-68.61757	\$2,500	Short Term	Road commissioner	In planning phase

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Isle Au Haut, Town of	(7) Loop Road: at Poor Cybles Install Driveway culvert 48" x 40' squash culvert.	44.07439/-68.63554	\$6,000	Short Term	Road commissioner	In planning phase
	(8) Dewitt Drainage in Village: Storm water drainage system improvement/upgrade	44.07228/-68.63630	\$125,000	Long Term	Road commissioner	In planning phase
Matinicus Isle Plantation (Note: No municipal roads)	(1) Install Emergency Generator at island shelter/municipal office. Phase 1: <i>Acquire equipment</i> ; Phase 2: <i>Install/test equipment</i>	43.862131/-68.891999	P1:\$6,000 P2:\$1,500	Short Term	Assessors	New P1: Completed 2017 P2: Planned 2019
	(2) Forestry: Conduct WUI Study (DACF-Forestry). Selective cutting to reduce fire hazard	Various Locations	\$25,000 - \$150,000	Long Term	Assessors / State / Public/Private Partnership	Updated Project. Deferred; pending funding
	(3) Selective upgrades / replacement of plantation-owned electrical supply system (limited segments)	Various Locations	\$5,000 - 25,000	Long Term	Assessors	Deferred; pending funding
	(4) Improve drainage; install / upsize culverts on plantation-owned ways – projects as needed	Various Locations	\$2,500 - \$10,000	Long Term	Assessors	As Needed-pending funds availability
North Haven, Town of	(1) Purchase and install a standby generator for the Fire Station	44.14477/-68.87178	\$22,000	Short Term	Select Board	Preparing request for bids
	(2) Stabilize the headland and implement erosion control measures at Pulpit Harbor pier	44.15670/-68.88103	\$5,000 - \$40,000	Long Term	Select Board	Exploration Phase

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
North Haven, Town of	(3) Upgrade drainage and culverts of flood prone roads.	Various Locations	\$10,000-\$25,000	Long Term	Select Board	In Planning Phase
Owls Head, Town of	(1) Obtain a generator for the Town Municipal Building (an implementation item in the school and airport emergency plans, as septic systems depends on pump)	44.06327/-69.09228	\$25,000	Long Term	Select Board	In planning phase
	(2) Re-engineer and construct a new Boat Ramp at the end of Main St (to reduce washouts associated with severe storms and the current poor ramp design)	44.08437/-69.05367	\$25,000	Long Term	Select Board	In planning phase
	(3) Pursue Community Rating System upgrade	Town-wide Policy	\$5,000	Long Term	Select Board/ Planning Board/ Legislative Body	In planning phase
	(4) Town wharf: replace existing tidal guides Piles and connections to float to wharf with stronger units.	44.08478/-69.05314	\$10,000	Medium Term	Harbor Master	Contingency project pending funding for wharf replacement
	(5) Improve drainage, upsize culvert projects-as needed.	Various Locations	\$3,000-\$10,000	Long Term	Select Board	Deferred Pending Funding
Rockland, City of	(1) Assess facility, procure and install generator and ancillary equipment at city shelter facility	44.10527/-69.11227	\$55,000	Long Term	City Manager/Public Services/EMA	New. Deferred pending funding
	(2) Tolman Rd: Ditch 2,500' stone line and add check dams.	44.129496/-69.129618	\$19,000	Medium Term	Services	Deferred: pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Rockland, City of	(3) West Meadow Rd: Ditch 7,500 blast where needed, add (6) 24" x 40' HDPE culverts.	44.12516/-69.13078	\$35,000	Medium Term	Services	Deferred: pending funding
	(4) Mountain Rd: Ditch 2,500' and add (2) 24" x 40' HDPE culverts.	44.12071/-69.14329	\$12,500	Medium Term	Services	Deferred: pending funding
	(5) Bog Rd: Ditch 5,000' and add (4) 24" x 40' HDPE culverts.	44.13589/-69.13923	\$24,000	Medium Term	Services	Deferred: pending funding
	(6) Thompson Road Bridge: Upgrade bridge	44.11180/-69.13917	\$60,000	Long Term	Services	Deferred: pending funding
	(7) Rockland Harbor Park (Middle Pier/Buoy Park): to prevent further damage to seawall, remove current asphalt cover, excavate, add bigger fill and more riprap, and recover with asphalt	44.10191/-69.10667	\$300,000	Long Term	Harbor & Waterfront	Deferred: pending funding
	(8) Municipal Fish Pier: to prevent further damage to seawall, remove current asphalt cover, excavate, add bigger fill and more riprap, and recover with asphalt	44.10308/-69.10343	\$250,000	Long Term	Harbor & Waterfront	Deferred: pending funding
	(9) Sandy Beach Park: more riprap to prevent further erosion	44.098111/-69.104999	\$50,000	Long Term	Harbor & Waterfront	Deferred: pending funding
	(10) Improve drainage; upsize culverts as needed	Various Locations	\$3,000 – 10,000	Long Term	Services	Deferred: pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Rockport, Town of	(1) Grub out and stone line spillway Tolmans Pond Dam and install 24" x 40' overflow culvert and repave.	44.17515/-69.15094	\$15,000	Medium Term	Public Works (Portions Private)	Deferred
	(2) Old Rockland Road: upsize existing CMP with 4' x 5' x 30' bottomless box culvert, raise road 2' x 200' x 21' on average and repave.	44.15542/-69.11626	\$60,000	Short Term	Public Works	Project planned for 2018-2019
	(3) West St Ext: Replace existing 48"x40' aluminum culvert- replacement size not yet known	44.17515/-69.15094	\$100,000+	Short Term	Public Works	New- Planning In Progress 2018-2021
	(4) Upgrade ditches, culverts & drainage including but not limited to School St (800 feet with 6 catch basins).		\$8,000	N/A	Public Works	Completed
	(5) Improve ditching, upsizing culverts as needed in the Warrenton Street area	44.12719/-69.08500	\$7,000 – 14,000	Short Term	Public Works	In progress
	(6) Annis Lane: Overflow pipe/culvert replacement upgrade to 36" pipe	44.19996/-69.11023	\$2,000- \$4,000	Short Term	Public Works	New (2018-2019)
	(7) Park Street (near cemetery): Overflow pipe/culvert replacement upgrade to 18" pipe	44.18656/-69.13050	\$2,000- \$3,000	Short Term	Public Works	New- Planning in Progress (2018-2019)
	(8) Improve drainage and upsizing culvert projects as needed	Various Locations	\$3,000 – \$10,000	Long Term	Public Works	In Progress
Saint George, Town of	(1) Assess facility. Procure & Install Generator and ancillary equipment at municipal shelter	43.96771/-69.21268	\$57,000	Long Term	Town Manager	New. Completed
	(2) Complete upgrade in Community rating System (CRS)	Town-wide Policy	\$10,000	Short Term	Town Manager & Select Board	New. Planning in progress

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Saint George, Town of	(3) Improve ditching, upsize culverts as needed	Various Locations	\$3,000 – \$10,000	Long Term	Road Commissioner	Pending Funding
South Thomaston, Town of	(1) Island Road intersection with Village Road. Reconstruct, elevate 380' of roadway. Reconstruct retaining wall and stabilize and protect eroding shoreline.	44.00572/-69.12413	\$168,000	Medium Term	Select Board / LEMD / Road Commissioner	New-Deferred pending funding
	(2) Island Road adjacent to Elwell Point. Reconstruct, elevate, realign 400' of roadway, stabilize and protect shoreline.	44.00572/-69.12413	\$190,000	Medium Term	Select Board / LEMD / Road Commissioner	New-Deferred pending funding
	(3) Improve drainage and upsize culverts as necessary	Various Locations	\$3,000 – \$10,000	Long Term	Road commissioner	Deferred pending funding
Thomaston, Town of	(1) West Meadow Rd: Up size existing 8' x 45' arch culvert with 7' x 10' x 45' bottomless box culvert. Add headwalls and riprap intake and outlet.	44.10457/-69.15305	\$181,102	Long Term	Public Works	Reopened & revised Project in 2015. Deferred, pending funding
	(2) Main Street to School Street; drainage project (crosses Rt. 1 and Mall area) proposed new 42" storm drain culvert and catch basins; related to MDOT #017890		\$220,000 (from 2009 est.)	N/A	Public Works (ICW MeDOT)	Completed
	(3) Install Generator and transfer switch Public Works Facility		\$15,000	N/A	Public Works	Completed. New project 2017.
	(4) Assess facility, procure and install generator and ancillary equipment at new municipal shelter facility	44.07872/-69.18290	\$55,000	Long Term	Town Manager/Select Board	New. Deferred pending funding
	(5) Improve drainage; culvert upsize projects as needed	Various Locations	\$3,000 – 10,000	Long Term	Public Works	Deferred pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Union, Town of	(1) Clary Hill Rd: Elevate 300' x 21' x 18" on average using gabion baskets repave road for use as low water crossing.	44.19958/-69.30545	\$42,000	Medium Term	Public Works	Deferred pending funding
	(2) Rebuild Section of Carroll Rd to prevent washout from Medomak River.	44.25044/-69.33691	\$375,000	Long Term	Public Works	<i>New- Added project in 2016.</i> Deferred- pending funding
	(3) Improve drainage and upsize culverts projects as needed	Various Locations	\$5,000 – \$15,000	Long Term	Public Works	Deferred pending funding
UT (Criehaven and Muscle Ridge Shoals townships) (Note: No municipal roads)	(1) Forestry: Selective cutting to reduce fire hazard	Various Locations	\$5,000-\$100,000	Long Term	Maine Land Use Planning Commission/ME Forest Service/ County Commission	Deferred pending funding
Vinalhaven, Town of	(1) Conduct vulnerability assessment of island to identify flood potential and make recommendations	Various Locations	\$75,000	Long Term	Selectmen	NEW
	(2) Improve communication delivery systems (at EOC) and between citizens. Includes internet service, digital communication, and training for EOC personnel/elected	Various Locations	\$10,000	Medium Term	EMA Director and Selectmen	NEW
	(3) Install generators for EOP identified community shelters and critical public infrastructure.	Various Locations	\$100,000	Long Term	Selectmen	NEW

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Vinalhaven, Town of	(4) Education/Training for floodplain manager to best serve and protect private and public property owners.	Town Policy	\$5,000	Short Term	CEO and Selectmen	NEW
	(5) Assess and recommend mitigate/adaptive measures for sewer infrastructure	Various Locations	\$20,000	Long Term	Sewer Commissioners and Selectmen	NEW
	(6) Assess and adapt all public buildings in the floodplain. Consider relocation if necessary.	Various Locations	\$150,000 – \$500,000	Long Term	Selectmen	NEW
	(7) Poor Farm Rd: Remove ledge and improve ditch line 500' upsize (1) 15" x 40' culvert and (1) 30" X 40' culvert, remove soil over wet spot 200' x21' x 2' and install geo-textile pillow and replace gravel.	44.07476/-68.79846	\$20,000	Medium Term	Road commissioner	Deferred pending funding
	(8) Calderwood Neck Rd: Improve ditch line at Privilege Hill and upsize existing culvert.		\$21,000	N/A	Road commissioner	Completed
	(9) Round The Island Rd at Deadmans corner: Upsize existing 15" x 40' culvert to 30" x 40' culvert and riprap intake and outlet.	44.07546/-68.80909	\$4,000	Medium Term	Road commissioner	Deferred pending funding
	(10) Zekes Point Rd: Elevate and shape road 6" x 16' x 5,000'	44.11509/-68.84200	\$67,000	Long Term	Road commissioner	Updated project Deferred pending funding
	(11) School Street: Elevate 200' x20' at least 3' (to get out of floodplain) and repave.	44.04804/-68.82882	\$25,000-\$40,000	Medium Term	Road commissioner	Updated Project Deferred pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Vinalhaven, Town of	(12) Improve drainage and culvert upsizing as needed (<i>Currently over 100 culverts are at least 30 years old</i>)	Various Locations	\$75,000-\$100,000	Long Term	Road Commissioner	Updated Projects-Ongoing
	(13) North Haven Road (south of Loud's Pit Rd) – 1,500 ft, increase road height by at least 3 feet to keep from flooding. Currently occurs 4-5 tide cycles per year.	44.06653/-68.83669	\$100,000 - \$150,000	Long Term	MDOT State-Aid Rd and Road Commissioner	NEW
	(14) North Haven Road – Folly Pond culvert upsize. Possible assessment of risk from flooding if beaver damn breaks.	44.077184/-68.844597	\$25,000	Medium Term	Road Commissioner	NEW
	(15) Pequot Road – Ocean View Rd intersection and south to Viking driveway. Raise road upsize culvert as needed. Pave road.	44.04906/-68.81728	\$45,000 – 65,000	Long Term	Road Commissioner	NEW
	(16) Provide BMP workshops for public/private forest owners at least once every three years.	Various Locations	\$1,000	Short Term	Fire Chief	NEW
	(17) Selective Harvest/Slash Reduction on town properties to reduce fire danger.	Various Locations	\$40,000 – 75,000	Long Term	Road Commissioner and Selectmen	NEW

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Warren, Town of	(1) Sandy Shores Road Site 1: Replace 7-foot culvert with aluminum box culvert 13 ft. span by 8-foot rise approx. 31 feet long. (Work would need to be done mid-summer when water is lowest. This road is the only access to at least 36 homes and 75 campsites).	44.09059/-69.24893	\$320,000	Short Term	Road Commissioner	Budget figure \$320K-pending funding. Planned for FY-19
	(2) Replace shared Generator Fire Station/Town Office/Warming Shelter complex	44.11718/-69.25338	\$35,000	Medium Term	EMA Director/Town Manager	New. Pending Funding
	(3) Improve ditching and upsize culverts as needed	Various Locations	\$3,000 – \$30,000	Long Term	Road Commissioner	Pending Funding
Washington, Town of	(1) Vanner Road; replace 48" steel culvert with 48" fiberglass culvert; build headwalls to eliminate erosion		\$25,000	n.a.	Public Works and Selectmen	Completed 2015
	(2) Youngs Hill Road; replace (2) 60" steel culverts with (2) 60" fiberglass culverts; build headwalls to eliminate erosion		\$25,000	Medium Term	Public Works and Selectmen	Completed 2016
	(3) Fitch Rd at Davis Stream. Upsize 2 existing 5' culverts with one 40' concrete bottomless culvert. (Phase 1: Design/Permitting; Phase 2: fund and complete)	44.23496/-69.43112	\$180,000	Long Term	Contract, Selectmen and Public Works	New. Phase 1 in process, Phase 2 deferred pending funding

Community	Project (in Order of Priority)	Project Lat/Long	Cost estimate in 2018 dollars	Timeline	Responsible Agency	Status of Plan resubmitted 2019
Washington, Town of	(4) McDowell and Maple Grove Cemeteries. Major tree pruning/removal to mitigate wind-caused damage to headstones; protect municipal burial grounds.	44.27119/ -69.37171 & 44.29646/ -69.36254	\$10,000	Short Term	Contract, Selectmen	New. Deferred pending funding
	(5) Old County Rd. Site 1: Up size existing 5 culverts of various sizes with one 4' x8' x 40' bottomless box culvert, elevate 2' x 21' x 200' and add precast head walls.	44.30624/ -69.39508	\$175,000	Long Term	Public Works and Selectmen	Deferred pending funding
	(6) Old County Rd. Site 2 @ Davis Stream: Up size existing 5 culverts of various sizes with one 4' x8' x 40' bottomless box culvert and add head walls.		\$65,000	Long Term	Public Works and Selectmen	Completed 2016
	(7) Skidmore Rd: Upsize existing twin culverts with 4'x 5' x 40' bottomless box culvert and add precast headwalls.	44.25976/ -69.33494	\$45,000	Medium Term	Public Works and Selectmen	Deferred pending funding
	(8) Improve drainage; culvert upsize projects as needed	Various Locations	\$3,000 – 10,000	Long Term	Public Works and Selectmen	Deferred pending funding

SECTION 6 PLAN MAINTENANCE PROCESS

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.

CFR §201.6(c) (4) requires a formal plan maintenance process to take place to ensure that the Mitigation Plan remains an active and relevant 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 life of the Plan.

Eighteen months prior to the Hazard Mitigation Plan update deadline, Knox County Emergency Management Agency will organize a Hazard Mitigation Planning Committee meeting. Knox 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 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 Knox County Hazard Mitigation Plan draft will be submitted to MEMA for review and recommendations before the final draft is forwarded to FEMA for review and approval pending adoption (APA). After APA, the towns will adopt the plan for final approval and start another five year plan cycle.

A. Monitoring the Plan

Knox County has developed a method to ensure that regular review and update of the Hazard Mitigation Plan occurs. The Knox County Emergency Management Agency has formed a Hazard Mitigation Plan Evaluation Team that consists of members from the County EMA office, the County Commissioners, Selectmen and EMA directors from member towns and the Local Emergency Planning Committee.

Every three years following the completion of this Plan update, the Knox County EMA will distribute a survey form to each of the local EMA directors in the county. This form will ask each director to comment on how his or her community has or has not addressed the Plan's objectives during the past three years. The County EMA will take the individual municipal results and compile a progress report that will be distributed to local officials. The County EMA also intends to work with MEMA officials and the Mid-Coast Regional Planning Commission in periods following disasters to better leverage mitigation opportunities for roads, critical facilities, residential structures, and businesses.

B. Evaluating the Plan

During the fourth year of the five-year planning cycle, the Knox County EMA will convene a meeting of the Hazard Mitigation Planning Team to review the risk assessment portion of the Plan to determine if this information should be updated or modified, and if additional hazards should be profiled. The Planning Team will also review the County EMA's status report on implementation, as well as each mitigation action to determine its continued relevance to changing situations and land developments in the County, as well as changes in Federal or State policy, and to ensure that each action is addressing current and expected conditions.

C. Updating the Plan

At the beginning of the fourth year of implementation of this Plan, the County EMA will convene a meeting of the local EMA Directors, who will serve as liaisons to other municipal staff and officials. Based on the evaluation of the Plan, proposed changes will be prepared for the following five-year period. The County EMA and the County Hazard Mitigation Planning Team will rely on local EMA Directors and public input obtained through public workshops, plan reviews, training sessions, website postings, mailings, and phone-in meetings. Proposed changes to the Plan will be submitted to MEMA and FEMA for review. The State Hazard Mitigation Officer will review the plan prior to submittal to FEMA for conditional approval; after the plan has been conditionally approved by both the State and FEMA, the municipal jurisdictions will subsequently have one-year to formally adopt the revised plan.

Incorporating Mitigation into other Planning Mechanisms	
Requirement §201.6(c)(4)(ii): (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?

A. Identification of local planning mechanisms.

County government is very limited in scope and authority in the State of Maine and does not have the staff or fiscal capabilities to control planning or development within municipalities. In Maine, most government authority is derived from State statutes and rules and with municipal “Home Rule” ordinances. All of the townships in the Unorganized Territory fall under the jurisdiction of the Maine Land Use Planning Commission, and are therefore controlled and governed by the State of Maine.

There is a total of 1 city, 16 towns, 1 plantation, and a portion of the Unorganized Territory consisting of 2 unorganized townships in the County. The UT is under the jurisdiction of the Maine Land Use Planning Commission (LUPC) and is thus controlled and governed by the State of Maine.

Section 5 of this Plan provides the strategies that will make Knox County more resistant to the hazards that were profiled in the previous sections. Municipalities have already incorporated the strategies recommended by this plan into local planning mechanisms as discussed in the paragraphs below. By adopting this plan, each community, as well as Knox County, is agreeing to continue implementation of these strategies.

Available planning mechanisms at the municipal level include:

- Local comprehensive plans; Most Knox 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.
- Municipal Planning Board efforts to improve Community Rating System standing;

- Capital improvement plans (only 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 cost benefit analyses;
- GIS based road infrastructure inventory management efforts;
- Emergency management and mitigation planning;
- Fire prevention planning; including participation in mutual aid agreements and multi-town wildfire training exercises; and
- Shoreland zoning ordinances; all of the towns in Knox County are required to have a shoreland zoning ordinance, whether adopted by the municipality or imposed by the Maine Department of Environmental Protection. The State's Land Use Planning Commission has adopted shoreland protection controls for the County's portion of the Unorganized Territory. 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.
- Subdivision review requirements; Maine state law contains criteria that local officials must use in conducting subdivision reviews. In addition, many communities have also adopted subdivision regulations aimed at managing growth in their communities.
- Local Budgeting Processes (which are used to examine potential expenditures in detail and establish overall spending priorities);
- Local flood plain management Ordinances. As documented in Section 5, all of Knox County's organized municipalities have joined the Flood Insurance Program and have adopted floodplain management ordinances aimed at managing development in flood-prone areas. In addition, all portions of the Unorganized Territory are in the Flood Insurance Program by virtue of being under the regulatory jurisdiction of the State's Land Use Planning Commission.
- Training for NFIP ordinances

The majority of the mitigation measures that were identified, and all of the actions selected by individual communities are either structural, public educational, or emergency planning measures.

B. 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 and does provide information to local units of government, as well as technical assistance and support.

Following approval of the Plan by FEMA, the County EMA will send a copy [or, post to website and send an email] 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 will be utilized to their greatest extent to complete the community's mitigation measures.

All towns in Knox County hold annual town meetings which are an integral part of public planning (the City of Rockland holds regularly scheduled council meetings). These meetings allow all citizens equal opportunity to communicate their concerns and opinions on the state of the town and how to move forward with these concerns. The citizens in attendance at these meetings have a vested interest in the town and how and what is funded annually. Through the municipal budget process and long-term planning based on the identified mitigation actions, towns will be better able to allocate funding for these projects to safeguard their communities.

Note: See Strategy section of this plan, page 5-3, for a town-by-town summary of existing authorities, policies, programs and resources available to accomplish hazard mitigation.

The County EMA Office will monitor the implementation of projects that were listed by the communities. The County EMA Office will also continue to assist municipalities with the completion of FEMA Hazard Mitigation Assistance (HMA) Grant applications.

At the local level, there has been implementation progress in some areas, but no known actions in other areas:

- Local comprehensive plans: no State money for new plans or updates
- Local budget processes: see list of projects completed with town funds
- Road maintenance planning efforts: some towns in Knox County are now tracking repair costs and repetitive damages more closely
- Emergency management and mitigation planning: – This has included dam exercises, ICS/NIMS training.
- Ordinances: no State money for new plans or updates
- Grant application: when available, Most of the towns are now aware that 406 mitigation funding can be obtained through the Public Assistance Program after a disaster declaration.

In addition, the County EMA and all municipal EMAs have continued to advise their respective jurisdictions on pending hazard events, such as winter storms, as well as posted public service announcements in public locations such as municipal offices.

The County EMA has notified municipal EMAs and local officials of hazard mitigation workshops such as those related to the Pre-Disaster and Hazard Mitigation Grant programs, and workshops with hazard mitigation content such as those sponsored by Maine Dept. of Transportation's Local Roads Center for tracking annual road conditions and associated costs.

Continued Public Participation	
Requirement §201.6(c)(4)(iii): (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)?

Knox County is committed to involving the public directly in the continued reshaping and updating of the Hazard Mitigation Plan. The Hazard Planning Team is responsible for reviewing and updating the Plan. Members of the Planning Team will continue to represent the public through their municipal affiliations. All meetings will continue to be open to the public in order to gain meaningful input to the Plan.

Copies of the approved Plan will be issued to each municipality [or notified by email about posting to the County website] and therefore available to the general public through the municipal offices in the County. Additionally, the County will post the Plan on its web site, assuring not just county, but statewide access and beyond. The Plan will include the address and phone number of the Knox County EMA Office that is responsible for keeping track of public comments on the Plan.

The Knox County EMA Office will also provide a public comment period at each meeting of the Hazard Mitigation Team to assure a public forum for input. The County EMA Office will be responsible for providing public notice for each meeting of the Hazard Planning Team, for hosting the meeting, for providing information about the public comment period and for managing the data that is gathered from it.

Knox County EMA considers hazard mitigation as more than just a written plan. The Plan itself is part of a larger strategy that includes preparedness, training, exercises, response, project implementation and recovery operations. Demonstrating this vision and commitment are the following public outreach efforts undertaken by Knox County and include:

- Maintaining and updating the Knox County EMA website
- Maintaining emergency communications systems
- Exercises, with After-Action follow-up as necessary
- Continuous updating of Emergency Operating Plans (EOPs)
- Participation in forums such as the annual Maine Partners in Preparedness Conference

The address and phone number of the Knox County EMA Office is:

301 Park Street
Rockland, ME 04841
TEL: 207-594-5155

Appendix A - Maps

USING KNOX COUNTY HAZARD MITIGATION MAPS

The Knox County Hazard Mitigation Maps visualize information provided in Municipal Mitigation Surveys (Appendix B) and Hazard Mitigation Projects by Municipality starting on page 5-27. Additional information includes municipal offices and public safety critical infrastructure locations (ex. Fire & EMS, Law Enforcement, 911 Dispatch, Emergency Management).

Mitigation project map labels are derived from the Town Abbreviation, Plan Year, and Priority Number in mitigation project list. For example, City of Rockland project labels would be as follows - "RD.18.1", "RD.18.2", "RD.18.3", etc.

Only SITE-SPECIFIC data is mapped. Each town has projects/areas with mitigation opportunities that apply town-wide; and thus are not included on the maps. For more information see Municipal Mitigation Surveys (Appendix B).

MAP DATA SOURCES: Municipal and County governments, Maine Office of GIS, and the National Park Service

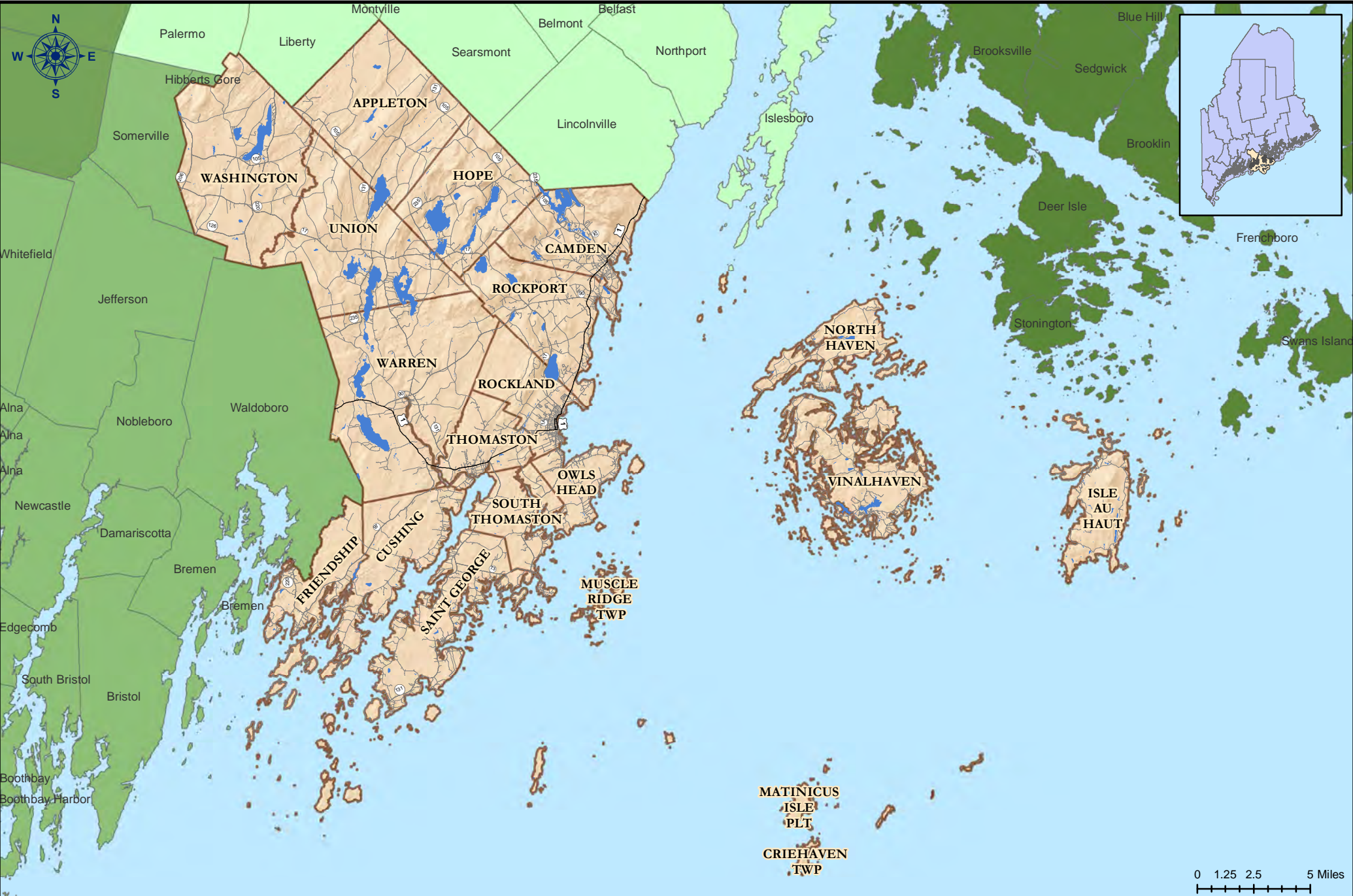
HAZARD MITIGATION MAP SYMBOL LIBRARY:

-  Public Safety Critical Infrastructure
-  Town Office/City Hall
-  Municipal Landing
-  Ranger Station
-  Mitigation Projects

Municipally Identified Areas with Mitigation Opportunities

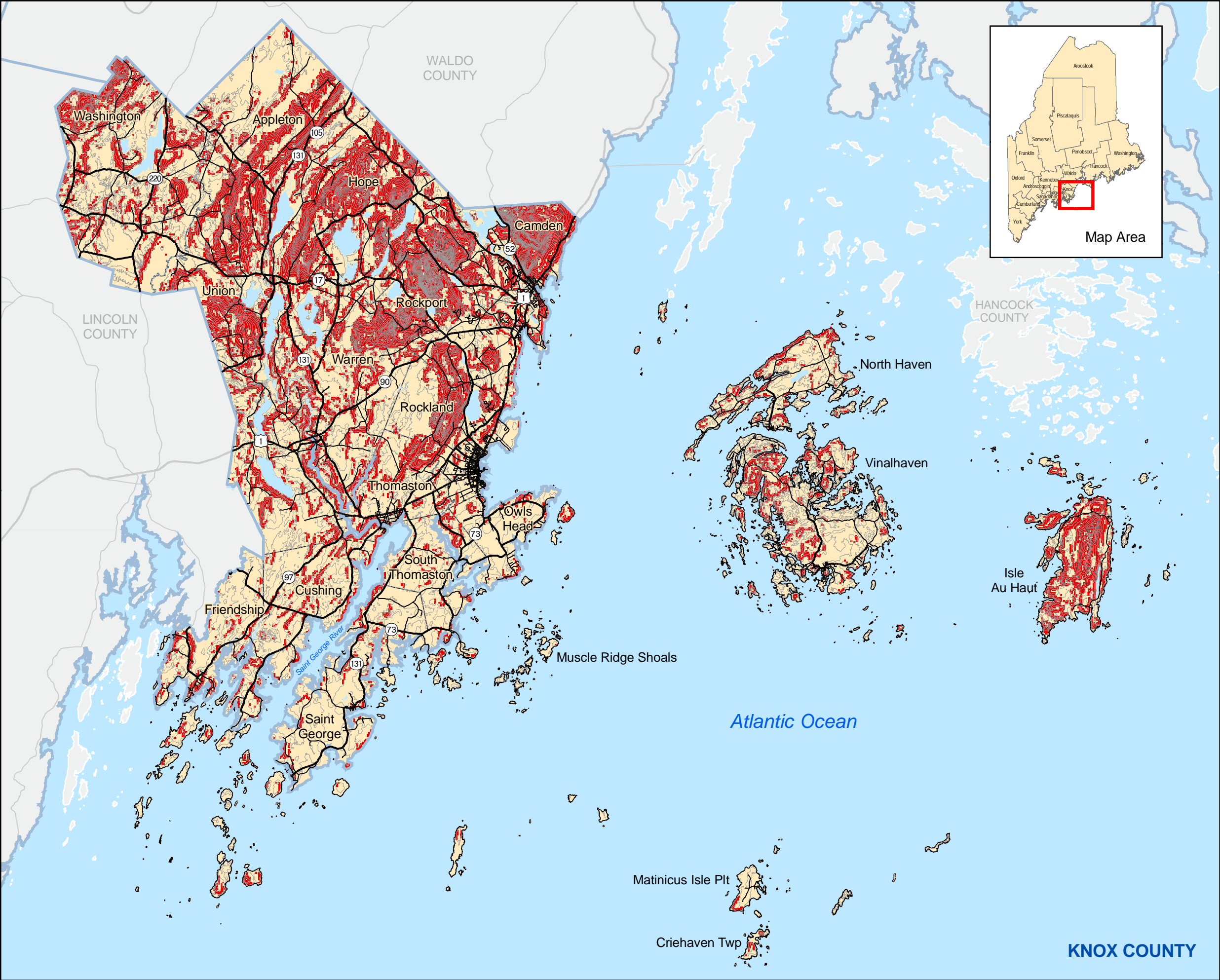
-  Erosion
-  Erosion/Landslides
-  Flooding
-  Flooding/Severe Summer Storms
-  Flooding/Severe Summer Storms/Erosion
-  Flooding/Severe Winter Storms/Severe Summer Storms
-  Rockslide/Falling Debris
-  Severe Summer Storms
-  Severe Summer Storms/Wildfire
-  Severe Winter Storms
-  Severe Winter Storms/Severe Summer Storms
-  Severe Winter Storms/Severe Summer Storms/Wildfire
-  Severe Winter Storms/Vulnerable Population
-  Severe Winter Storms/Wildfire
-  Tree Damage
-  Vulnerable Population
-  Wildfire
-  High Density Vulnerable Population

**High Density vulnerable population – elderly housing/assisted living facilities/nursing homes*



COUNTY OF KNOX
MAINE
2019





STEEP SLOPES

LEGEND

- State road
- Township road
- 10 foot contours
- Water body
- Steep slopes (20% or greater)

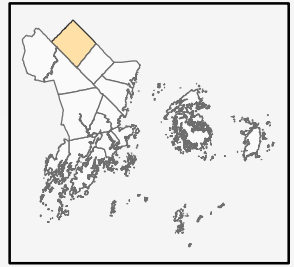


0 1.25 2.5 5 Miles

Map prepared by Eastern Maine Development Corporation
Sources: USGS, MEDOT and MEGIS
Map created: October, 2009



Montville



Liberty

Searsmont

APPLETON

Washington

Union

Hope

Legend

- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

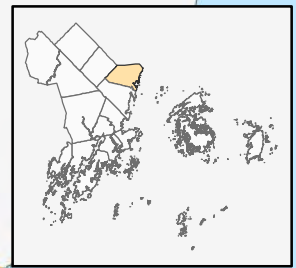
Municipally Identified Areas with Mitigation Opportunities

- Flooding





Lincolnville



Hope

CM.19.9

CAMDEN

CM.19.1.A - 1.F

CM.19.8

CM.19.2.A - 2.C

CM.19.3

CM.19.5

CM.19.4

CM.19.7

Legend

- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

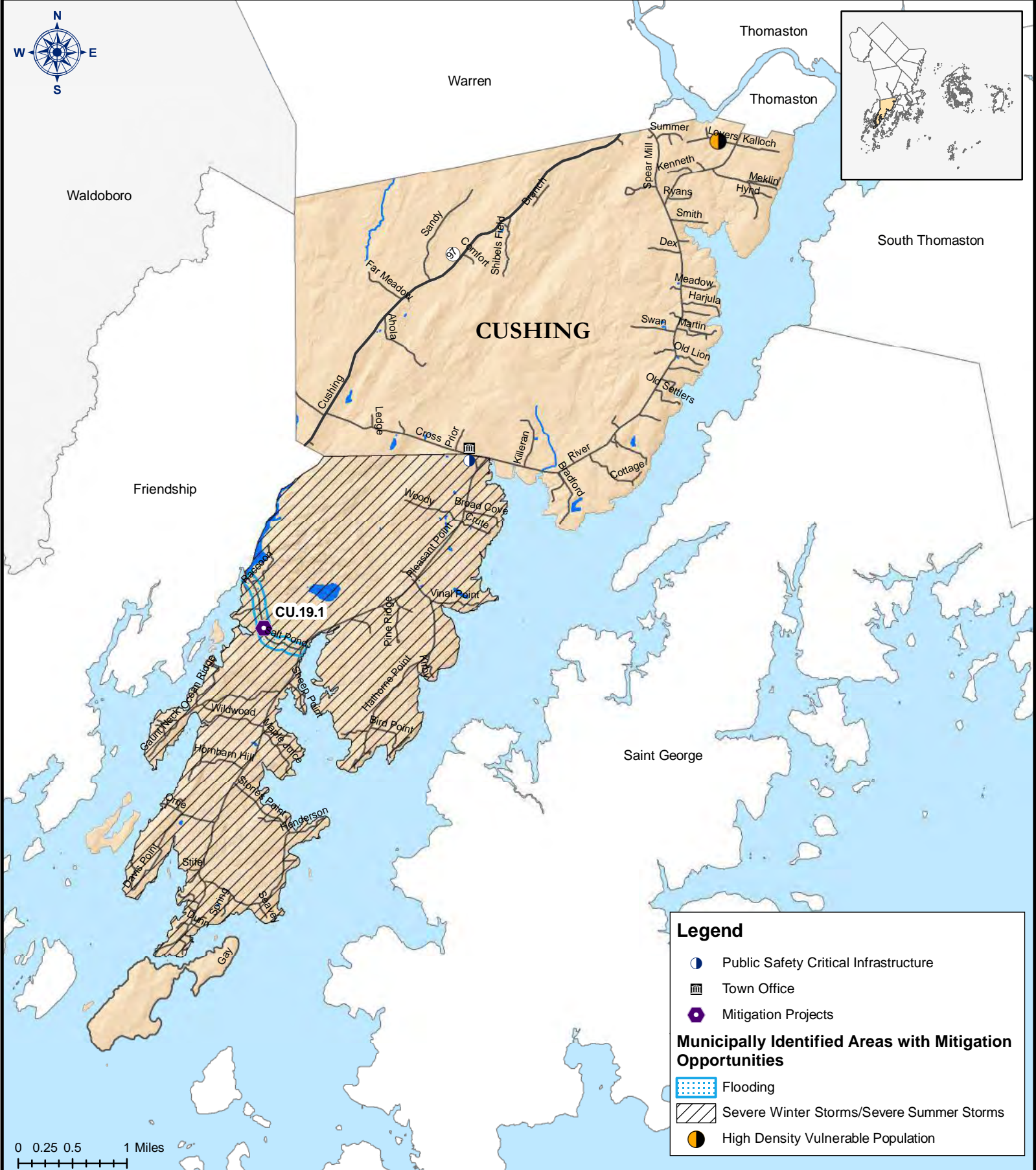
Municipally Identified Areas with Mitigation Opportunities

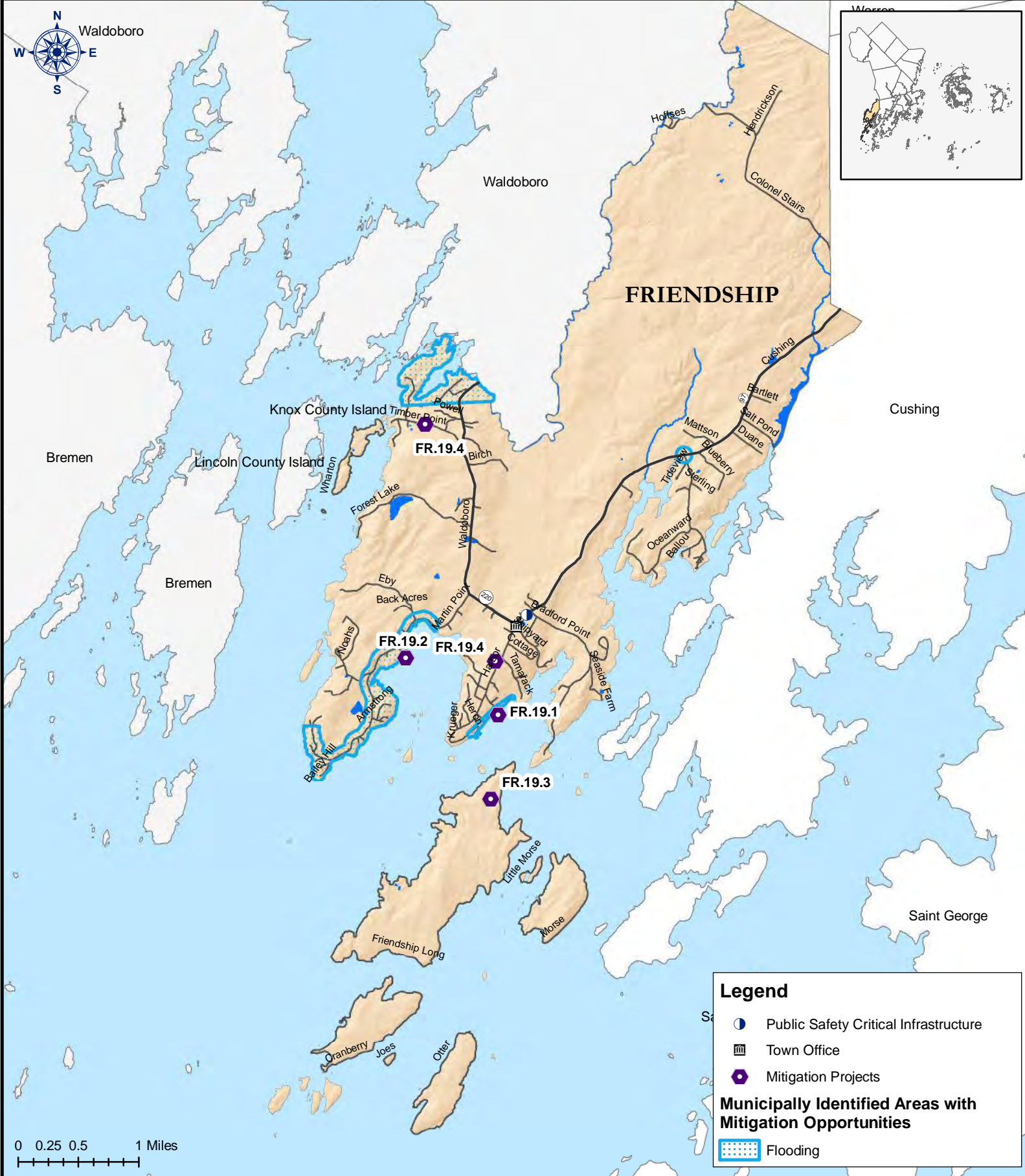
- Flooding
- Flooding/Severe Summer Storms
- Rockslide/Falling Debris
- Severe Summer Storms
- High Density Vulnerable Population

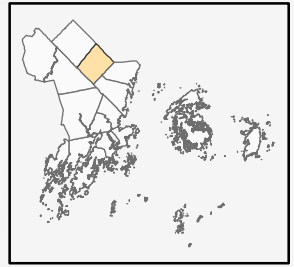
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CAMDEN,
TOWN OF
2019









Appleton

Searsmont

Lincolnville

HOPE

Camden

Rockport

Legend

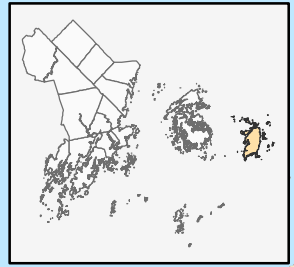
- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

Municipally Identified Areas with Mitigation Opportunities

- Flooding

0 0.25 0.5 1 Miles
|-----|-----|-----|-----|



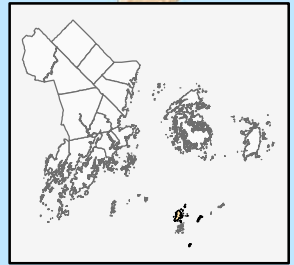


Legend

- Public Safety Critical Infrastructure
- Town Office
- Municipal Landing
- Ranger Station
- Acadia National Park
- Mitigation Projects

0 0.25 0.5 1 Miles



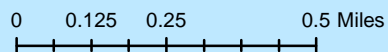


Legend

- Public Safety Critical Infrastructure
- Mitigation Projects

Plantation Identified Areas with Mitigation Opportunities

- Flooding



Criehaven Twp

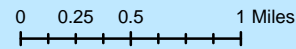
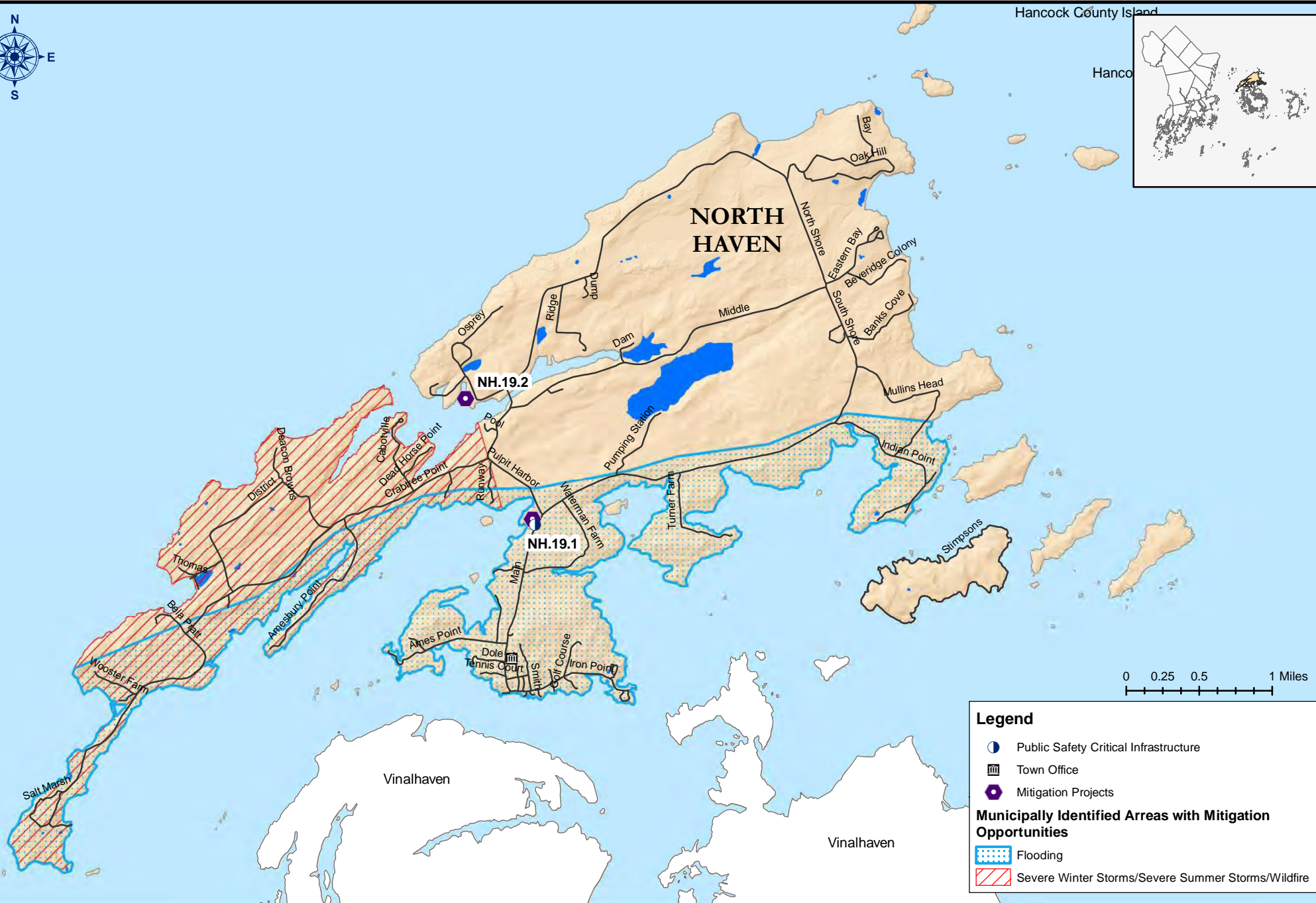
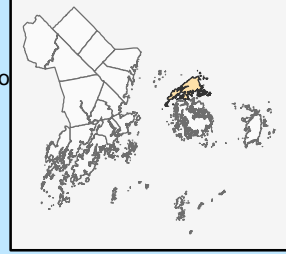
Criehaven Twp
Criehaven Twp
Criehaven Twp





Hancock County Island

Hanco



Legend

- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

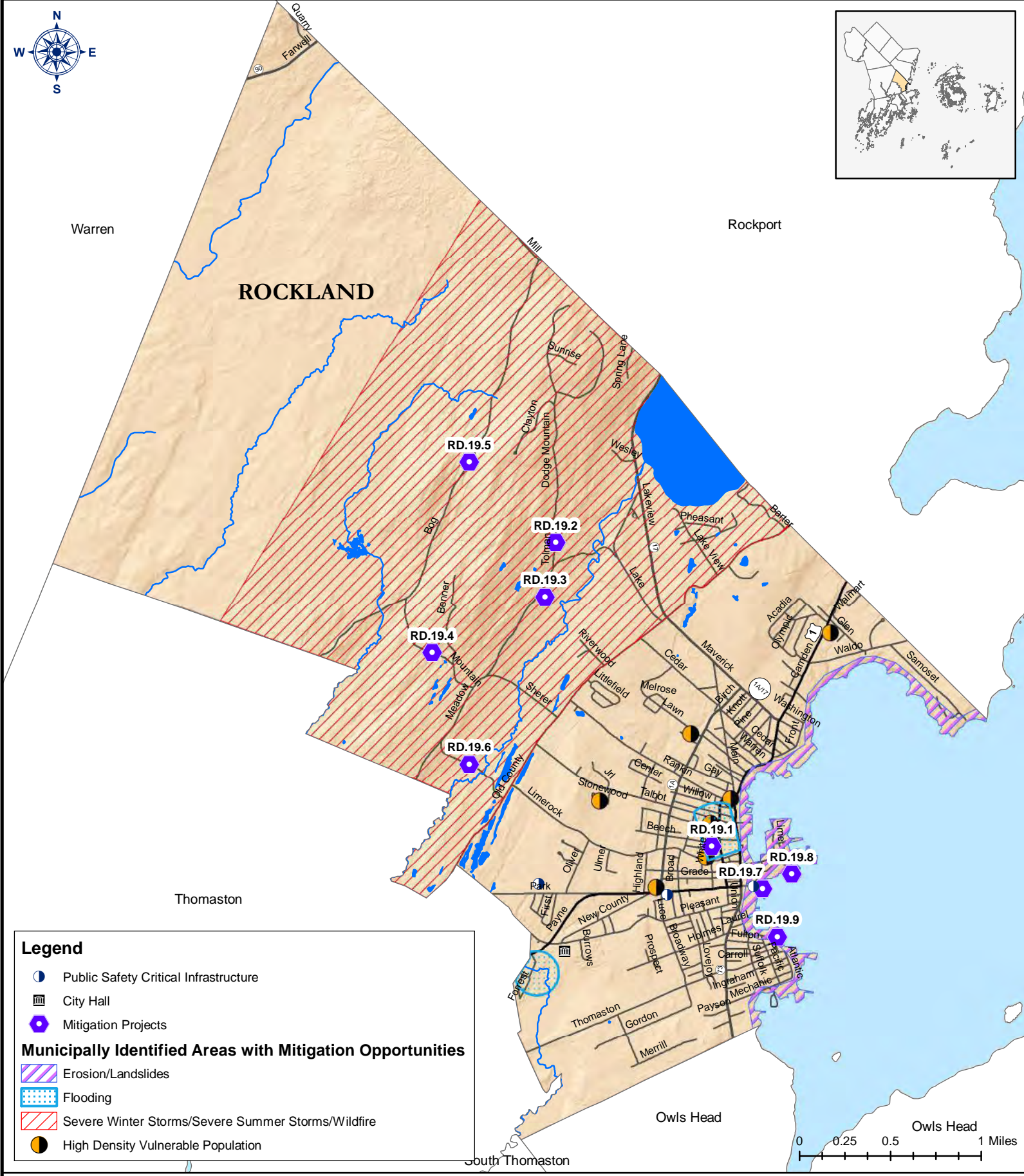
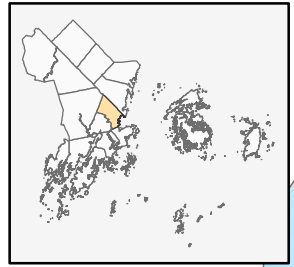
Municipally Identified Arreas with Mitigation Opportunities

- Flooding
- Severe Winter Storms/Severe Summer Storms/Wildfire

NORTH HAVEN,
TOWN OF
2019



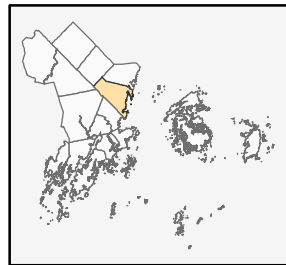






Hope

Camden



Union

Camden

Warren

ROCKPORT

Legend

- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

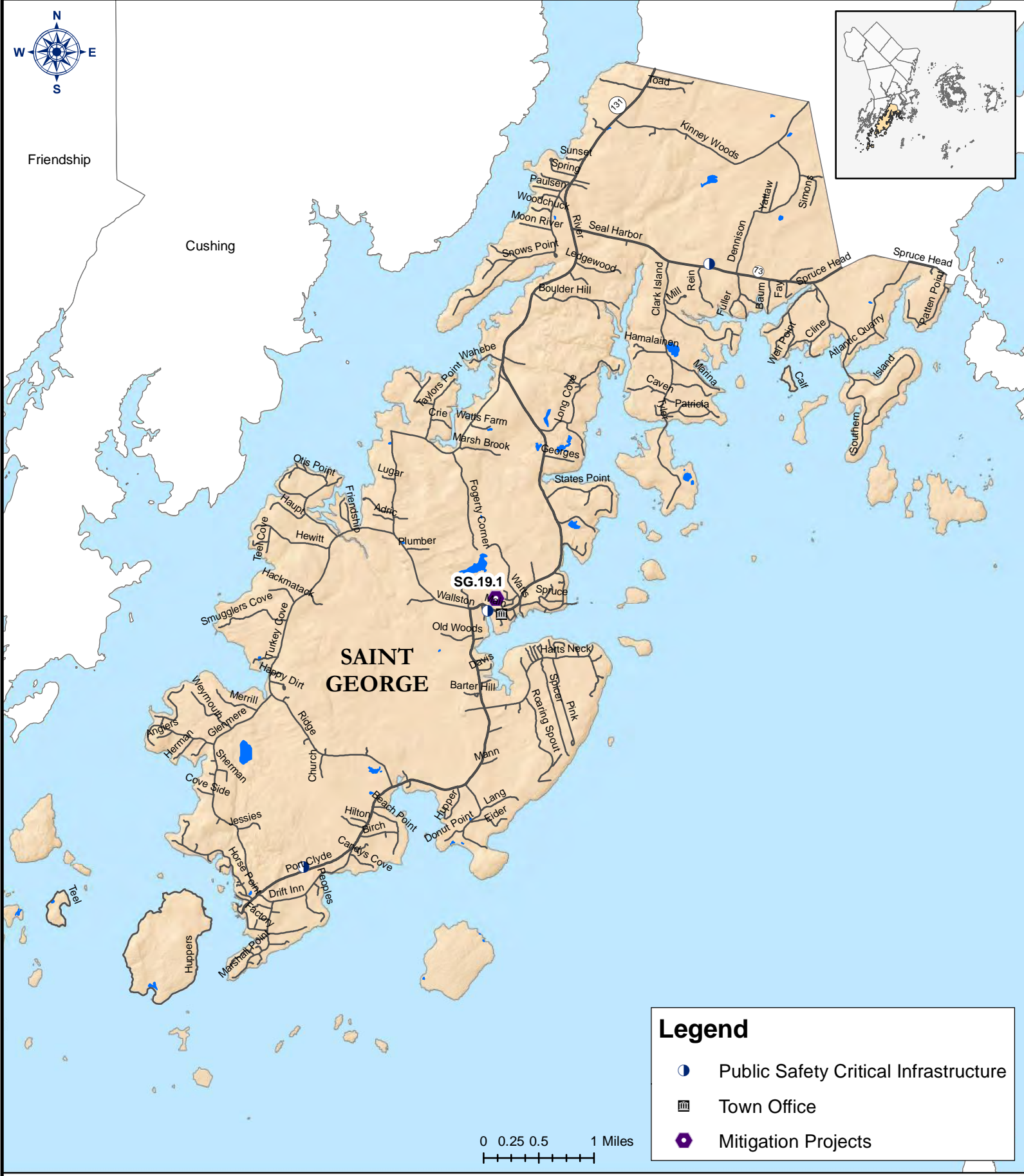
Municipally Identified Areas with Mitigation Opportunities

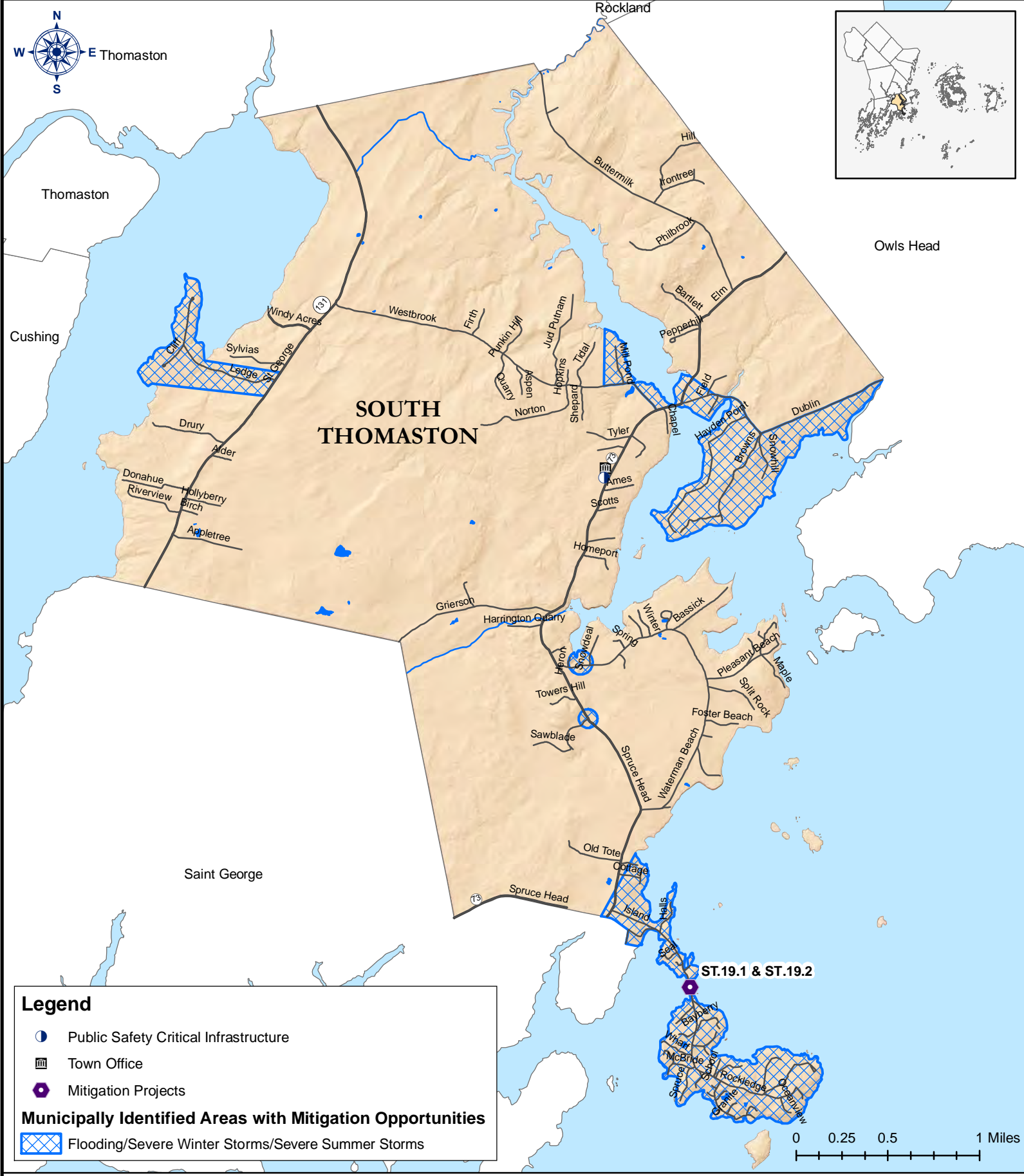
- Flooding
- Flooding/Severe Summer Storms
- Severe Winter Storms/Severe Summer Storms
- Severe Winter Storms/Wildfire
- Wildfire

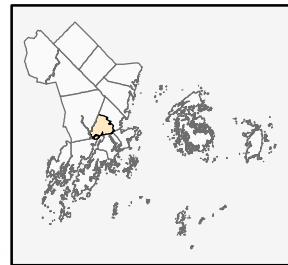
0 0.25 0.5 1 Miles

ROCKPORT,
TOWN OF
2019









Rockland

Warren

THOMASTON

Warren

Cushing

0 0.25 0.5 1 Miles

Legend

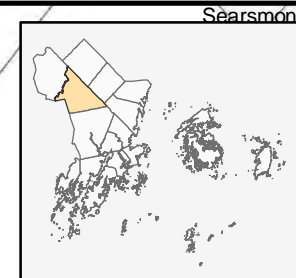
- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

Municipally Identified Areas with Mitigation Opportunities

- Flooding
- Flooding/Severe Summer Storms
- Severe Summer Storms
- Severe Summer Storms/Wildfire
- Severe Winter Storms
- Severe Winter Storms/Severe Summer Storms/Wildfire
- Severe Winter Storms/Vulnerable Population
- Vulnerable Population
- Wildfire
- High Density Vulnerable Population

THOMASTON,
TOWN OF
2019





Washington

Appleton

Hope

Camden

Rockport

Warren

Legend

- Public Safety Critical Infrastructure
- Town Office
- Mitigation Projects

Municipally Identified Areas with Mitigation Opportunities

- Erosion
- Flooding
- Flooding/Severe Summer Storms
- Flooding/Severe Summer Storms/Erosion
- Severe Summer Storms
- Wildfire
- High Density Vulnerable Population

UN.19.1

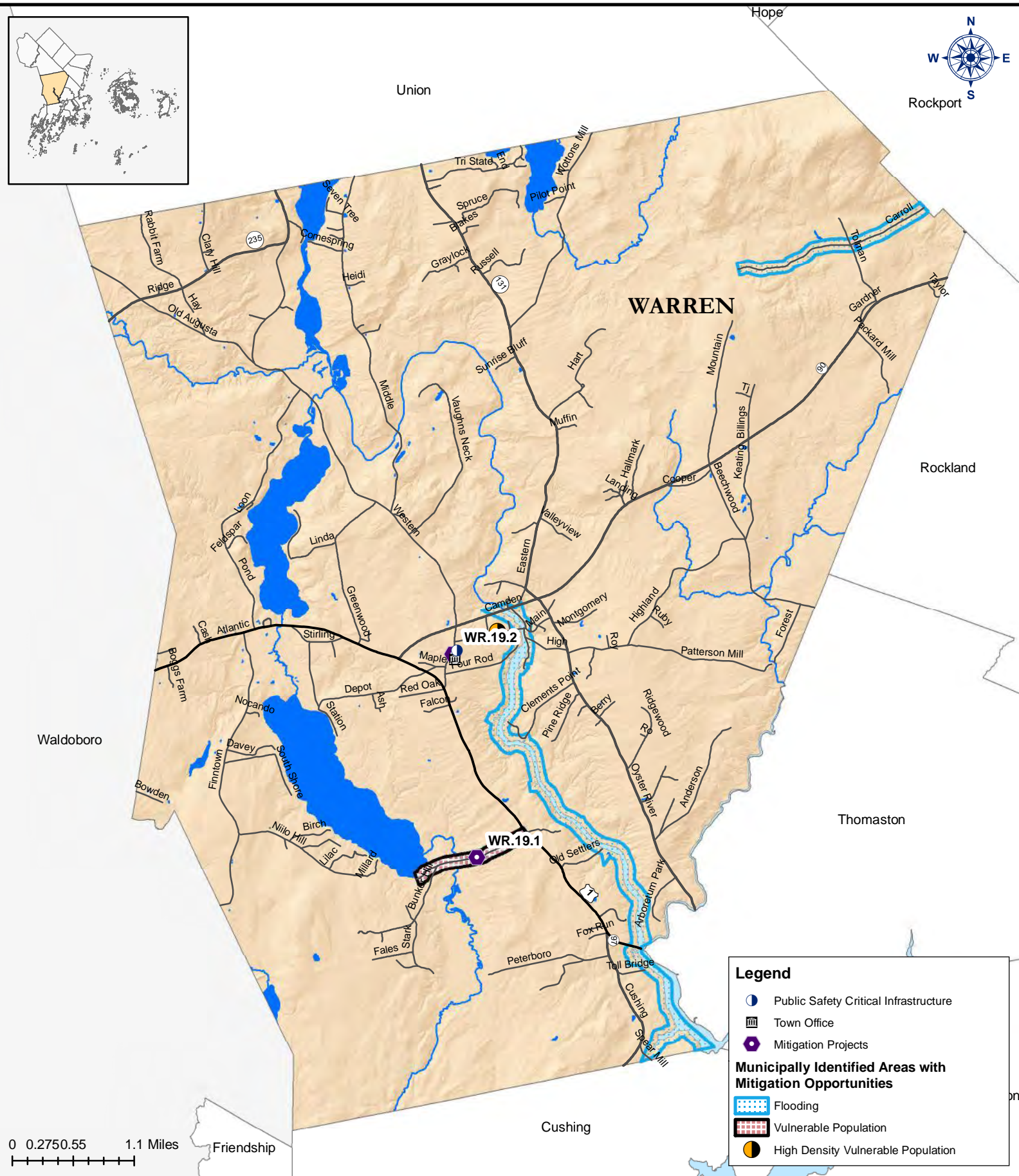
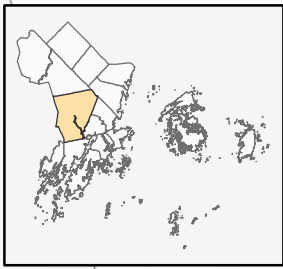
UN.19.2

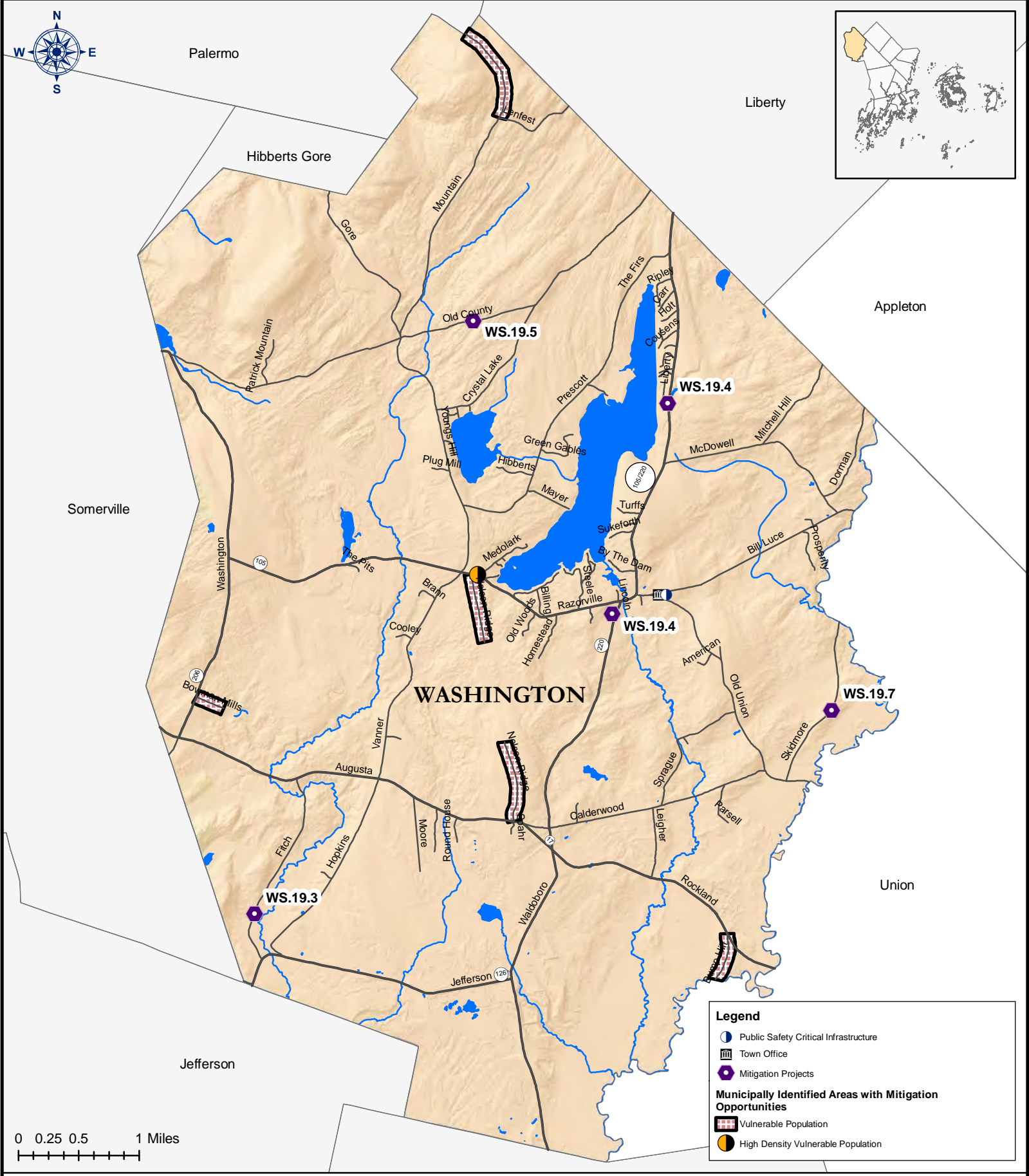
0 0.25 0.5 1 Miles

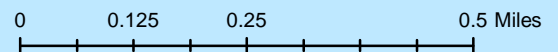
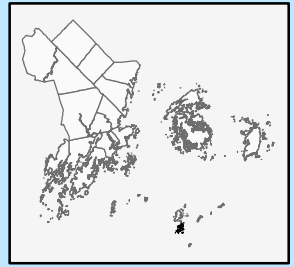
UNION,
TOWN OF
2019





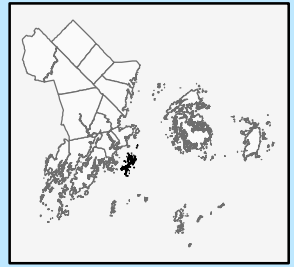






UNORGANIZED TERRITORY
CRIEHAVEN
TOWNSHIP
2019





**MUSCLE RIDGE
TOWNSHIP**

0 0.25 0.5 1 Miles

**UNORGANIZED TERRITORY
MUSCLE RIDGE
TOWNSHIP**

2019



Appendix B – Municipal Surveys

Knox County Hazard Mitigation Planning Municipal Survey 2016

received
2/11/17

Knox County Emergency Management is updating the Knox County Hazard Mitigation Plan. We are fortunate to be allowed to complete a county-wide plan, meaning you will not have to complete one on your own. We do however need your input and assistance! Completion of this survey is one of several ways that your municipality and the general public can provide details and stay involved in the plan revision process. We will use your information to help identify and prioritize the natural hazards to be profiled in the plan revision.

In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name:	Appleton
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	West Appleton road & flood plain areas
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Whole town → no ice jam recent history.
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	Whole town
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Whole town
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	elderly in general people on dead end and private roads
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Every Tuesday at 7:00 p.m.
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	John Fenner - Selectboard chair

Attach a separate page if necessary.

Thank you for taking the time to complete this survey! Please return by email or regular mail to:

Ray O. Sisk, EMA Director,
301 Park Street Rockland, ME 04841
Email: rsisk@knoxcountymaine.gov
Phone: 207-594-5155

Knox County Hazard Mitigation Planning Municipal Survey 2016

Knox County Emergency Management is updating the Knox County Hazard Mitigation Plan. We are fortunate to be allowed to complete a county-wide plan, meaning you will not have to complete one on your own. We do however need your input and assistance! Completion of this survey is one of several ways that your municipality and the general public can provide details and stay involved in the plan revision process. We will use your information to help identify and prioritize the natural hazards to be profiled in the plan revision.

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1. Community Name: Camden
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (<i>a marked up map is great!</i>): Many in the town might experience minor flood damage when faced with heavy rains and large amounts of water runoff. However, the major threat from flooding comes from the three dams the town owns. Attached is a flood map that outlines the major flood concerns during a dam failure. There are also high levels of flooding that occur by the intersection of Molyneaux rd and Barnstown rd by the Snow Bowl. The water builds up and ends up flooding Barnstown rd into Hosmer Pond.
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: The entire town is vulnerable to a severe winter storm, regardless of location. However, those residents living on a dead-end road and farther away from town are going to be most vulnerable to a storm. This is because it will take longer for public works and emergency crews to arrive to assist residents during a storm incident. Another vulnerable population is those living close to the ocean. Increased storm surge could have the potential to cause damage to the homes or property of these residences.
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: There are three areas that are most vulnerable to a summer storm. The first is the boats in the harbor, as many people live aboard these in the summertime. If there was a strong enough storm, it could lead to boats capsizing or running aground. The second concern are the homes by the ocean during severe summer storms. Just like winter storms, increased storm surge could lead to home or property damage. Lastly, the three town-owned dams are a concern during these storms. Any severe storm with a considerable amount of rainfall could lead to dam failure and major flooding throughout the town.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: There are a number of areas that are major concern in the town for a wildfire; however, any location around the woods poses a concern. Homes near the State Park, Coastal Mountain Land Trust, Ragged Mountain and in the Wildland Urban Interface all pose a major concern (especially the homes on dead-end roads in these areas).
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. One area of concern from a rockslide or falling debris are the homes on the Mt. Battie side of Rt. 52 from

Grove St. to Hopkins Ln. These homes are at the base of one of the steep sides of Mt. Battie and beneath considerable amounts of rocks and boulders that could potentially fall down the slope. Another natural hazard for the area not limited to Camden is drought. This past summer we (as did many others) experienced huge decreases in water levels that affect not only drinking water supply but also crop production and fire suppression.

7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):

Camden is home to a number of vulnerable populations, the largest being our elderly population. Camden has four elderly homes that will need attention in case of emergency: Quarry Hill, Merryspring Garden, Windward Gardens and Camden Hills Villa.

Camden also has a substantial amount of dead-end roads that could be an issue to first responders and utilities.

Camden has low income housing, like Applewood Apartments which houses a vulnerable population.

Camden receives a number of tourists throughout the year, peaking in the summertime. This becomes a vulnerable population in the sense that they are not familiar with the area, or its hazards. This unknowing can cause a hazard to the tourists as well as responders.

Lastly, Camden has a homeless population that will be affected in major emergencies or disasters.

8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):

The Select Board meets every other Tuesday of the month at 7pm.

9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.

Matthew Heath
31 Washington St.
Camden, ME, 04843
207-236-7950
mheath@camdenmaine.gov

Attach a separate page if necessary.

Thank you for taking the time to complete this survey! **Please return by email or regular mail to:**

Ray O. Sisk, EMA Director,
301 Park Street Rockland, ME 04841
Email: rsisk@knoxcountymaine.gov
Phone: 207-594-5155

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1. Community Name:	Cushing
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	SAIT Pond Rd.
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	pleasant point Davis pt Stones Point
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	pleasant point Davis point Stones Point
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	100 % of TOWN
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	As Above
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	25 %
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	2ND + 4TH MONDAYS OF THE MONTH
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	ARTHUR KISKITA Aiton Grover

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1. Community Name:	Friendship
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	Friendship/Waldenboro line, - Walker's beach Martin Point Rd, - all wharf in harbor - Junction 97 & Waldenboro Point
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Town Wide - Ice Jam Friendship/Waldenboro town line and Friendship Harbor
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	Town Wide
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Town Wide
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	all side roads off Rt 220 and 97 also off Harbor Road and Road off of Colonel Spaulding Road
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	2nd and 4th Tuesdays of each month @ 6:30
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	Philip Bromhall EMA Director 207-592-4361 (or 207-592-4212)

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2/23/17 Claffey

Hazard Mitigation Plan Town of Hope

①

②

RT 405 towards Appleton line
RT 105 Downhill from High St
RT 235 near Mansfield Brook
Island Lake between ponds

③

Town Wide -

④

Town Wide -

⑤

While a majority of Hope is forested the lack of canyons makes for a minimal risk for wild fire issue with the exception of a period of drought.

⑥

no other significant hazards

⑦

vulnerable populations primarily seasonal with
2 summer camps

⑧

Select Board - 2nd and 4th Tuesdays 18:30

⑨

Clarence Keller

received
3/7/16

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1. Community Name: <i>Isle au Haut</i>
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!): <i>- None</i>
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: <i>Some years the thoroughfare freezes, but the mailboat + Sunbeam keep it open.</i>
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: <i>- none</i>
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: <i>There are houses island wide that are vulnerable.</i>
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. <i>—</i>
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): <i>There are a few houses on dead-end roads/driveways.</i>
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): <i>meets every two weeks (or more) to do school payroll + treasurer's warrant. Usually Tuesdays, variable times.</i>
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. <i>John DeWitt - 335 2200 woof2200@yahoo.com selectboard1@isleauhautmaine.us</i>

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1. Community Name:	MATINICUS ISLE PCT
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	State wharf
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	- AIRSTRIP CAN BE MADE TEMPORARILY INACCESSIBLE - ALL POWER LINES ARE VULNERABLE - NO UNDERGROUND DISTRIBUTION
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Much of the island is at risk of wildfire
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	(very low concentration of elderly or physically at risk; a few very isolated)
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Board of Assessors meets 2x/month summer, 1x/month winter - irregular schedule
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	EVA or PAUL MURRAY 366-3695 EMA UTILITIES GEORGE TARKLESON 366-3970 TOWN OFFICE GARY PEARBODY 366-3018 ELECTRIC COMPANY CLAYTON PHILBROOK 366-3170 ASSESSOR + ROAD CREW WORKER

Attach a separate page if necessary.

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Robert

FD

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1. Community Name:	Matinecock Island
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	A little water at high tides over the town wharf
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Power outages near power lines from downed trees
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Anywhere without a recommended buffer zone
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Old School
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	Robert O. Young 366-3119 - Thomaston 354-5276

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received
2/28/17

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1. Community Name:	North Haven
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	Please see SLOSH map. Only the waterfront on the Thorofare is susceptible to extreme high tide flooding
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Power outages can occur anywhere in both winter & summer storms but are most common in the
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	west District along Crabtree Point Rd where the forest is most decayed.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	See above - the west district along Crabtree Pt Rd: decayed spruce forest
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Every Tuesday at 4 PM
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	Joe Stone, Town Administrator, 867-4433 nhadmin@midcoast.com

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1. Community Name:	OWLS HEAD, MAINE
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (<i>a marked up map is great!</i>):	minor at crocketts beach rd, & end of mahala ln, minor at end of makers lane, more at end of crescent beach road, beginning and end of ginn point and along stonehurst ave & along lighthouse rd., wharf st and main st. A small area at Head of the Bay Rte 73 and holiday beach rd & point view ln
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Power outage along any of the smaller side roads likely, Major feed lines are pretty much cut back by utilities. No ice jams likely at one bridge in town as it is ocean water fed
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	Utility and power outages likely along most smaller side roads major feed lines cut back pretty well by utilities and we have few problems on them except for old or dead trees beyond the utility ROW.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Majority of houses are built in wooded areas and are likely to suffer damage from wildfire/forest intrusion but it would be unreasonable to clear lands due to the sheer number of homes placed in those areas and sentiments of homeowners. Fire dept limits grass & debris fires and inspects all campfires in town for that reason.
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	Town has suffered major tree damage in hurricanes in the past (1950's) especially along the north shore and Lucia Beach road areas (1980's & 1990's) where hundreds of large spruces were downed so that kind of damage is possible.
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	All three of Owls Head's evacuation routes are vulnerable to flooding in extreme high tides North shore dr @ Ingraham Dr, Dublin Road at town line and 73 at Weskeag River and at the Waldo Tyler Sanctuary on Buttermilk ln We do however have an airport which would allow for supplies and assistance to be flown in.
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	The first and third monday of the month at 1600hrs and as needed.
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	<div style="margin-left: 40px;"> Frank Ross, EMA Director 335 North Shore Dr Owls Head, ME 04854 207 594-4076 voice/fax 207 380-8850 mobile </div>

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1. **Community Name:** City of Rockland

2. **Flooding:** Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):

Flooding within Rockland has been a problem in years past but Public Services and MDOT has worked on correcting the vulnerable areas. Larger culverts have been added, drainage systems have been upgraded, and water flow in these areas has improved greatly. Historically, properties along the lower end of Lindsey Brook between Broadway and Main Streets can see some water backup/flooding. Glenwood Ave on the Thomaston/Rockland town line will be another area that has seen flooding in years past but not of any significance since the mid to late 90's.

3. **Severe winter storms:** Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:

While any portion of Rockland can be impacted by severe winter storms, the vulnerable areas that could be cut off from road access and power would be any area west of Old County Road with the exception of Farewell Drive (Route 90). These areas contain roadways with steep grades and lined with trees. Typically our in town districts have little to no grade difference and the trees near the roadways have been trimmed back and manicured.

As far as power outages, when Rockland does experience them they don't seem to be a long lasting event. Some of the main lines and substations that power the area begin in Rockland; therefore we tend to be the first to see power return.

Rockland has not experienced any problems from ice jams in recent memory. Our only concern could be seen from the harbor but thankfully we have the USCG housed within and they keep a close eye on weather.

4. **Severe summer storms:** Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:

Again, any of the areas west of Old County Rd. For the same reasons as the winter storms.

5. **Wildfire/property damages:** Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:

Again, any area west of Old County Rd. West Meadow Rd and Bog Rd are out of our hydrant area and have no constant pressurized water supply.

6. **Other natural hazards:** Please identify areas in your municipality vulnerable to natural hazards not listed above.

The coastal properties within Rockland can present some unique challenges. Even with the harbors protection, strong winds and high tides can cause erosion problems and could cause landslides, like the one in 1996 on Waldo Ave. Shoring has been done in the years since to reduce the potential for another occurrence.

7. **Vulnerable populations:** Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):

Due to the possibility of residents being cut off from certain weather events, any resident living west of Old County Rd.

I would also consider the high population of elderly a risk. We have 4 group elderly living facilities that could require a lot of resources and manpower in the event of a severe storm.

8. **Governance:** When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):

The first and third Monday of the month at 530 pm, City Hall 270 Pleasant Street.

9. **Local contact information:** Please give us the name and contact info for someone we can talk with about these responses.

Chief Chris Whytock - 207-594-0318

Attach a separate page if necessary.

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1. Community Name: Town of Rockport
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (<i>a marked up map is great!</i>): Rockport Harbor & area (inc. Rockport Marine), Goose River at Main St. near Rt. 1, West Street Extension
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: Mount Pleasant , Mill Street, PBMC (have generator)
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: Rockport Harbor & area, PBMC
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: All wooded areas - including fields, Mt. Pleasant, Vinal/Gurney/Mill Street area
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): 39 Cul-de-Sacs or dead end roads with , approximately, 80 people living on them
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): 2nd Monday of the month at 7 PM with the 4th Monday a possibility
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. Susan Dates @ public works, Jason Peasley , Fire Chief, Steve Beveridge or Mike Young at PW

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1. Community Name: South Thomaston
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (<i>a marked up map is great!</i>):1) Spurge Head Island/Village 2) Ledge Rd to Cliff Rd 3) Keag Bridge to Mill Pond 4) Rt 73 @ Brookside Dr. 5) Waterman's Bch Rd @ Snowdeal/FR 180 6) Dublin Rd-Cuddy Cove /lower Hayden Pt. Rd
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: all areas mentioned above
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: all areas mentioned above
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:Many areas of the community vulnerable due to large forested areas.
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): EMA (Town Office) list of vulnerable people/disabled who may need assistance
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): Third Tuesday of each month @ 6:00 pm
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. Betty N. Thomas EMA Director- 594-7873- emadir.so.thomaston@gmail.com

Attach a separate page if necessary.

Thank you for taking the time to complete this survey! **Please return by email or regular mail to:**

Knox County Hazard Mitigation Planning Municipal Survey 2016

Knox County Emergency Management is updating the Knox County Hazard Mitigation Plan. We are fortunate to be allowed to complete a county-wide plan, meaning you will not have to complete one on your own. We do however need your input and assistance! Completion of this survey is one of several ways that your municipality and the general public can provide details and stay involved in the plan revision process. We will use your information to help identify and prioritize the natural hazards to be profiled in the plan revision.

In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name:	St. George
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	Roadways mostly all areas of town
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	All areas of town, many cottage roads with trees
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	Same as winter storms
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Town mostly forested with homes
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	We have had effects of the drought in 2016
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	We have an aging population and many live on dead-end roads
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Select Board meets on Monday night 2x month
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	Tim Polley Town Manager / EMA Director 207-372-8581 t.polley@stgeorgemaine.com

Attach a separate page if necessary.

Thank you for taking the time to complete this survey! Please return by email or regular mail to:

Ray O. Sisk, EMA Director,
301 Park Street Rockland, ME 04841
Email: rsisk@knoxcountymaine.gov
Phone: 207-594-5155

Knox County Hazard Mitigation Planning Municipal Survey 2016

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In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name: <u>TOWN OF THOMASTON</u>
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!): <u>Public Landing, Water St.</u>
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: <u>Thomaston St., Buttermilk Lane Road, Butler Road, Beechwood St., Old County Road, Oyster River Road, West Meadow Road, Marsh Road</u>
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: <u>Beechwood St., Wadsworth St., Water St., Brooklyn Heights Road, Ship St.</u>
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: <u>Beechwood St., Brooklyn Heights Road, Boakes St., Greenhouse Hill Road</u>
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. <u>NONE</u>
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): <u>Marsh Road, Butler Road, Branch Brook Road, Ross Ave., Sunrise Terrace, Bobolink Lane, Ferry St., Cross St., Knox St. Extension</u>
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): <u>2nd and Last Monday of each Month at 7:00 P.M.</u>
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. <u>James R. Cannon T.P.W.O. Cell # 691-1316</u>

Attach a separate page if necessary.

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Knox County Hazard Mitigation Planning Municipal Survey 2016

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In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name: Town of Union
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (<i>a marked up map is great!</i>): Clarry Hill Road, Carroll Road, Butler Road, Barrett Hill Road and Coggins Hill Road.
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: All areas vulnerable to winter storms, flooding on St. George River and Medomak rivers. Clarry Hill Road ice jams and Carroll Road as well as many smaller culverts within town.
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: Town wide but especially on the hills of Clarry hill road, Coggins hill, Barrett Hill, Butler Road. Power outages on Middle Road where the senior care center is located.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: North Union, Bump Hill Road, Sidelinger Road and Happy Hollow Rd as well as Mt. Pleasant Road.
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. Dams in East union (natural?) Coggins Hill and Shepard Hill erosion from Medomak River could jeopardize both roads
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): Union has many dead end roads with only one way of egress, Union has one of the oldest communities in Maine and the elderly are especially vulnerable.
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): Selectmen meet the first and third Tuesday of the month at 6:30 PM.
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. Jay Feyler (Town Manager), Grand Watmough(CEO), Kevin Soule (Fire Chief)

Knox County Hazard Mitigation Planning Municipal Survey 2016

Rev 12/22/14

Knox County Emergency Management is updating the Knox County Hazard Mitigation Plan. We are fortunate to be allowed to complete a county-wide plan, meaning you will not have to complete one on your own. We do however need your input and assistance! Completion of this survey is one of several ways that your municipality and the general public can provide details and stay involved in the plan revision process. We will use your information to help identify and prioritize the natural hazards to be profiled in the plan revision.

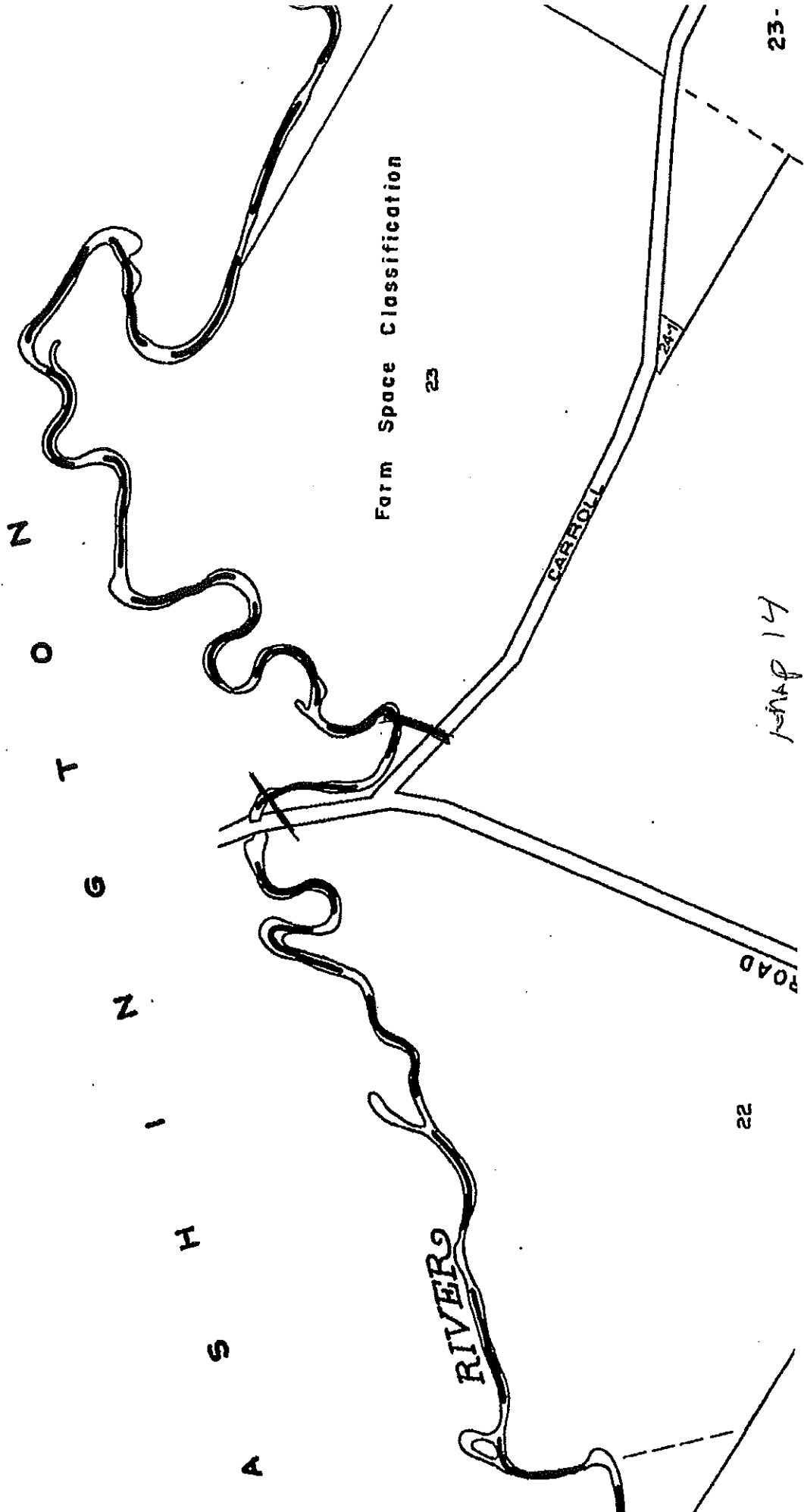
In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name: <u>Town of Union</u>
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!): <u>Town wide but especially along the St. George River.</u>
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: <u>Town wide but more so High Elevation zone</u>
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: <u>Town wide</u>
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: <u>North Union and Swamp Hill Rd. Sidelinger Rd and Happy Hollow Rd.</u>
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. <u>Intersection of Shepard Hill Rd + Carroll Rd with Madamok River 530' of Flood plain Rd.</u>
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): <u>Select Board meet 1st and 3rd Tuesday each month</u>
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. <u>(1st) Jay Foyler (TOWN MANAGER) (2nd) GRAST WATKINS (CEO) (3rd) Kevin Soule (FIRE CHIEF)</u>

Attach a separate page if necessary.

Thank you for taking the time to complete this survey! Please return by email or regular mail to:

Ray O. Sisk, EMA Director,
 301 Park Street Rockland, ME 04841
 Email: rsisk@knoxcountymaine.gov
 Phone: 207-594-5155



Knox County Hazard Mitigation Planning Municipal Survey 2016

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In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name: <u>VINALHAVEN</u>
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!): <u>Sandy Pt, Vinal Cove St.</u>
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: <u>(NE EXPOSURE)</u> <u>N. HAVEN Rd - Vinal Cove</u> <u>2nd St Pt</u> <u>TIP TOE</u> <u>LOOMBS, NORK</u> <u>NE EXPOSURE</u>
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: <u>(SW EXPOSURE)</u>
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: <u>OVER 30% PROTECTED,</u> <u>WUI STUDY (2008) ON FILE</u> <u>(ORANGE MAP) UNMANAGED LANDS.</u>
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. <u>DROUGHT? SOLE SOURCE AQUIFER</u>
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): <u>FEMA MAINTAINS A LIST OF SPECIAL</u> <u>NEEDS PPL IN OUR COMMUNITY.</u>
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): <u>Every other Tuesday @ 6pm</u>
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. <u>ANDREW DORR</u> <u>863-2042</u> <u>MARC CANDAGE</u> <u>863-4604</u>

Attach a separate page if necessary.

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Ray O. Sisk, EMA Director,
 301 Park Street Rockland, ME 04841
 Email: rsisk@knoxcountymaine.gov
 Phone: 207-594-5155

SUMMER/WINTER STORMS

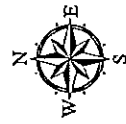
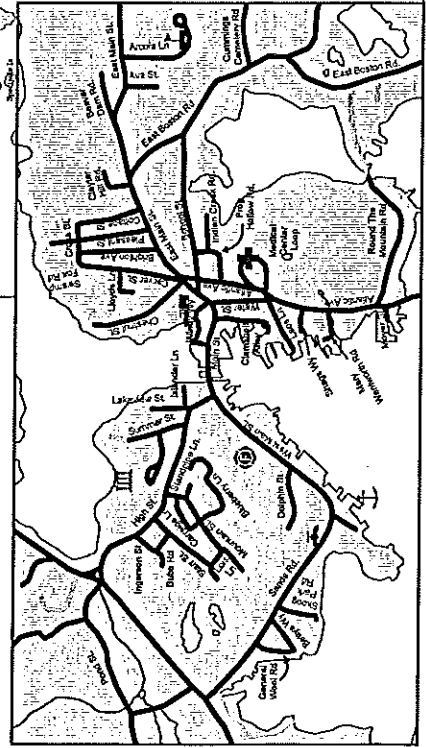
SUMMER/WINTER STORMS

VINALHAVEN E-911 ROADS

Legend

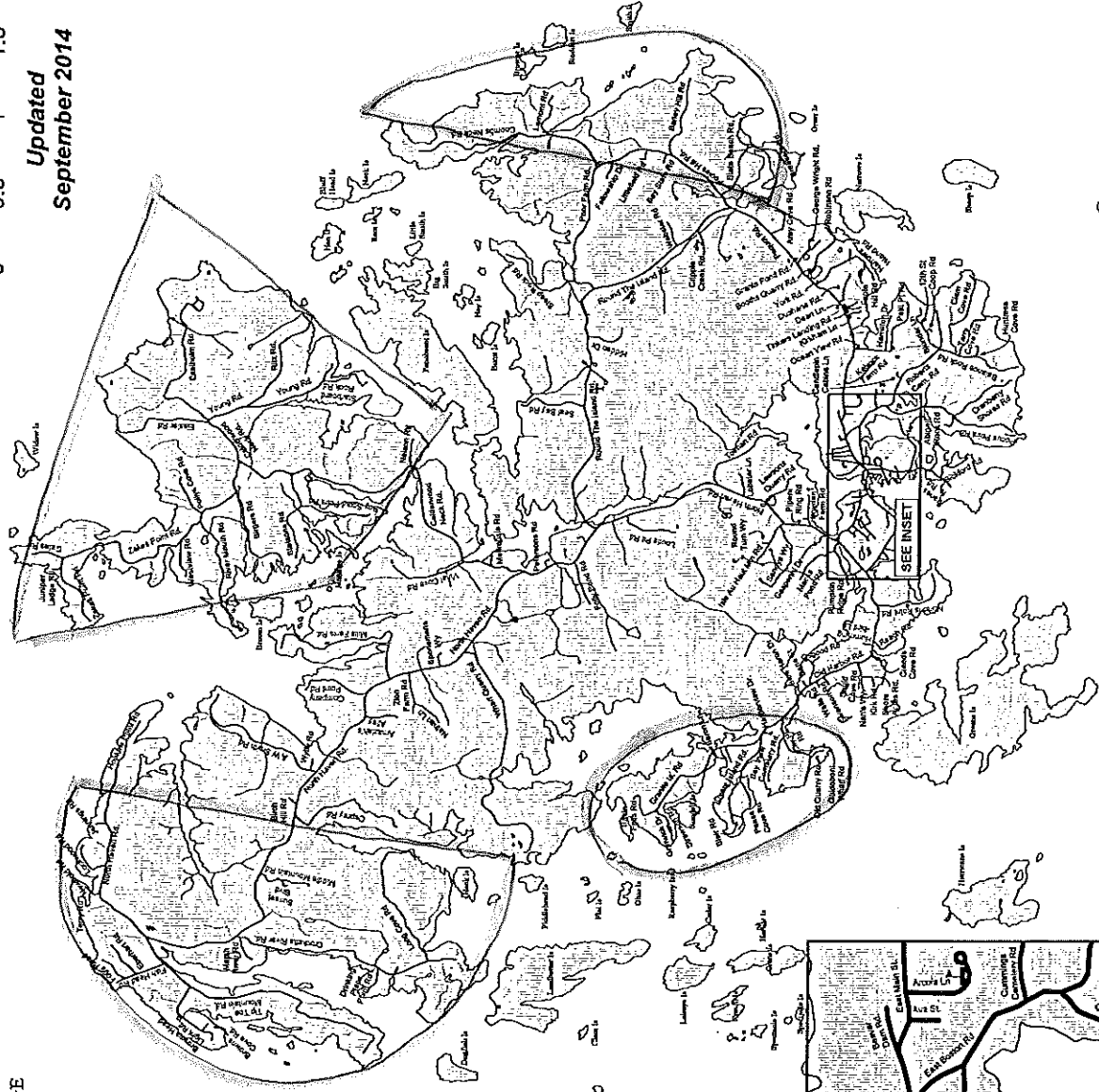
- Public Roads - E911
- Private Roads - E911
- Other Private Roads
- ✈ Airport
- ⚡ Transfer Station
- 💧 Water Supply
- ⚡ Electric Substation
- 🚒 Fire Dept.
- 🏛 Town Office
- 🏢 Public Works
- 🚰 Sewer Plant
- 🚢 Ferry Terminal
- 🏥 Medical Center
- 🎓 School

Village Inset



Miles
0 0.5 1 1.5 2

Updated
September 2014



45° North
CARTOGRAPHIC

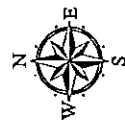
FIRE

FIRE

VINALHAVEN E-911 ROADS

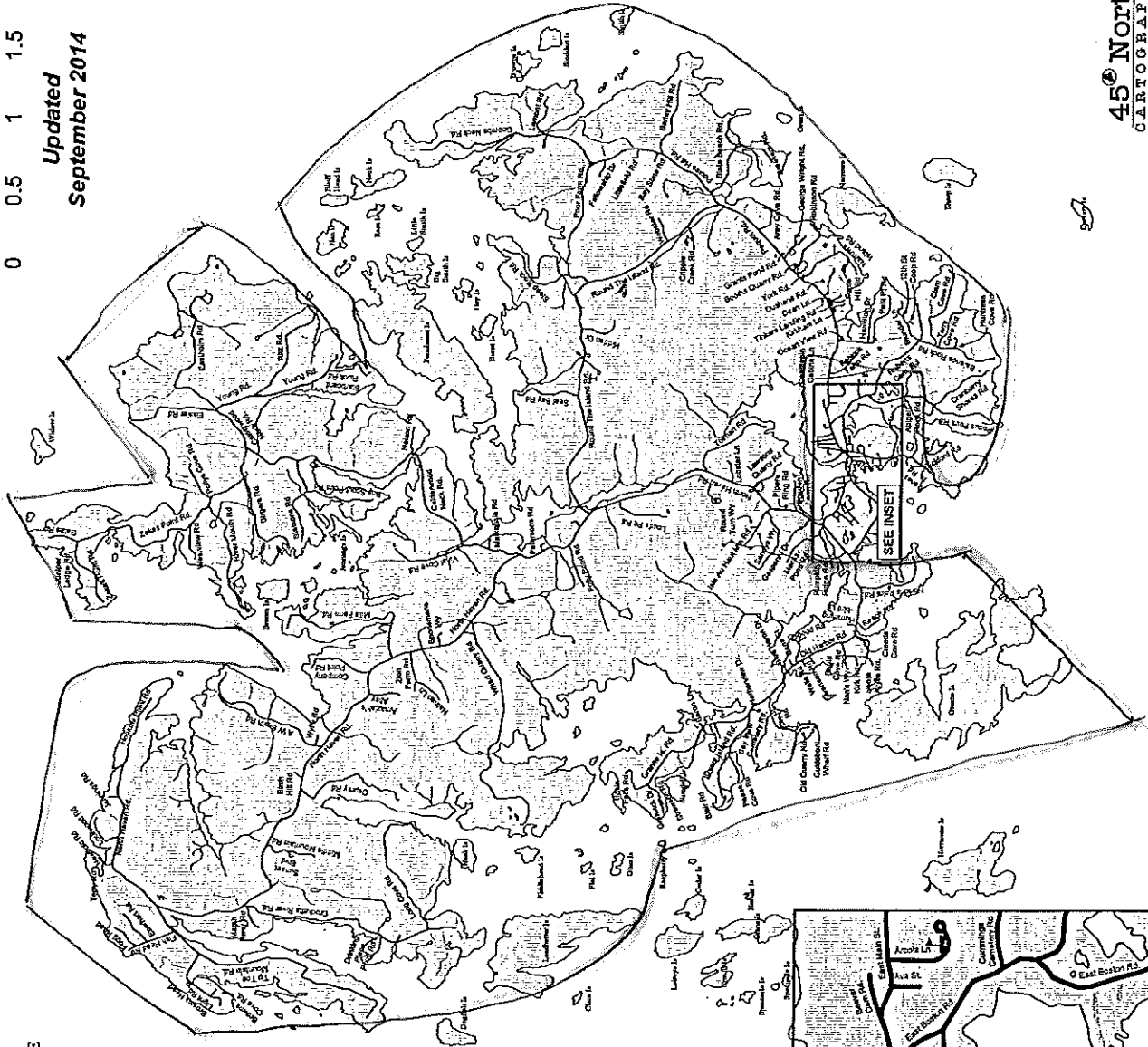
Legend

- Public Roads - E911
- Private Roads - E911
- Other Private Roads
- ✈ Airport
- ⚡ Transfer Station
- 💧 Water Supply
- ⚡ Electric Substation
- 👮 Fire Dept.
- 🏛 Town Office
- 🏭 Public Works
- 🚰 Sewer Plant
- 🚢 Ferry Terminal
- 🏥 Medical Center
- 🎓 School

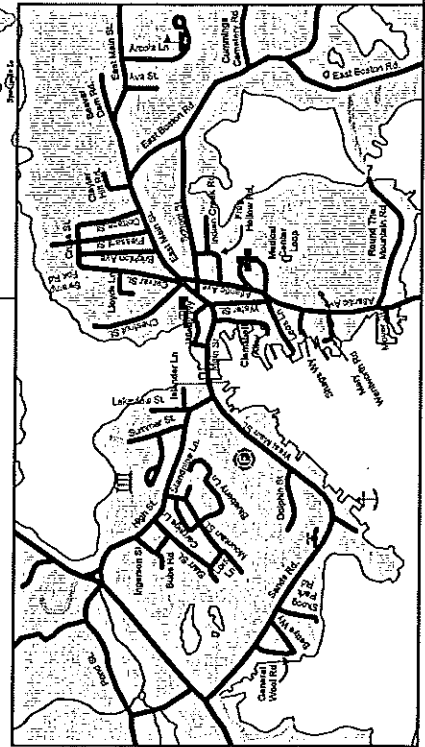


Miles
0 0.5 1 1.5 2

Updated
September 2014



Village Inset



45° North
CARTOGRAPHIC

Flowers

Updated
September 2014

-
- A horizontal scale bar with a black background and white markings. The word "Miles" is written vertically to the left of the bar. The bar is divided into segments by white tick marks. Below the bar, the numbers 0, 0.5, 1, 1.5, and 2 are printed, corresponding to the tick marks.

[illegible]

Knox County Hazard Mitigation Planning Municipal Survey 2016

Knox County Emergency Management is updating the Knox County Hazard Mitigation Plan. We are fortunate to be allowed to complete a county-wide plan, meaning you will not have to complete one on your own. We do however need your input and assistance! Completion of this survey is one of several ways that your municipality and the general public can provide details and stay involved in the plan revision process. We will use your information to help identify and prioritize the natural hazards to be profiled in the plan revision.

In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name: Town of Warren
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (<i>a marked up map is great!</i>): Along the St. George River Basin. Carroll Road has flooded over in the past.
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages: The entire town has had problems with power outages during sever storms and there has never been a problem with ice jams.
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.: Same as above. The entire town has had power outages during storms.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires: There are none.
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above. There are none.
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads): Sandy shores only has one way in and out. If the culvert fails on Sandy Shores, it could block off over 75 residents.
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm): Board of Selectmen meet every other Wednesday at 7 p.m.
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses. William Lawrence, Town Manager 207-273-2421 & manager@warrenmaine.org

Attach a separate page if necessary.

Thank you for taking the time to complete this survey! **Please return by email or regular mail to:**

Ray O. Sisk, EMA Director,
301 Park Street Rockland, ME 04841
Email: rsisk@knoxcountymaine.gov
Phone: 207-594-5155

RWO
12/22/16

Knox County Hazard Mitigation Planning Municipal Survey 2016

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In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name:	Town of Washington
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	End of 2nd main road & old Union road. When Madomak river floods, possible on Davis stream on Fitch road
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Severe winter storms Town wide power outages Town wide, Ice jams on Madomak river & Davis stream (Fitch road)
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	Severe summer storms could be Town wide, may affect Northern part mostly, Power outages North south 500 on western part Fitch road, Hopkins, Tanner.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	Washington has a lot of areas where houses are built in the woods, old county road, off the mountain road
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	Bump hill, Nelson ridge North & South, Mountain road Bowmans mill road
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Every Wednesday
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	Wes Daniel - 845-2887 Town Office, 845-2235 Home Phone

Attach a separate page if necessary.

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Email: rsisk@knoxcountymaine.gov
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Knox County Hazard Mitigation Planning Municipal Survey 2016

RWD
12/22/16

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In addition to completing the survey and participating in plan update meetings, we will assist you with updates to your community hazard mitigation map and mitigation projects from the current Hazard Mitigation Plan.

1. Community Name:	Washington
2. Flooding: Please identify areas in your community vulnerable to flooding and/or that have experienced repeated flood damages (a marked up map is great!):	Union Line To Calderwood Rd.
3. Severe winter storms: Please identify areas in your municipality vulnerable to severe winter storms including ice jams and power outages:	Rt 105 West Washington RT 220 Waldobro Rd.
4. Severe summer storms: Please identify areas in your municipality vulnerable to severe summer storms and the effects of power outages, storm-related debris, etc.:	Upper Port Mountain Rd.
5. Wildfire/property damages: Please identify areas in your municipality (for example, houses or vacation properties built in the woods) vulnerable to wildfire/forest fires:	
6. Other natural hazards: Please identify areas in your municipality vulnerable to natural hazards not listed above.	
7. Vulnerable populations: Please consider vulnerable populations in your municipality (for example, people living at the end of dead-end roads):	
8. Governance: When does your Select Board, Board of Assessors or City Council regularly meet (for example, first Monday of the month at 7pm):	Wed. night
9. Local contact information: Please give us the name and contact info for someone we can talk with about these responses.	Bentley Linscott 875-2322 Ward 875-2480

Attach a separate page if necessary.

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Phone: 207-594-5155



**Maine Department of Conservation
Maine Forest Service
Forest Protection Division**



Free Defensible Space Fuel Reduction Program Available to Communities



The Maine Forest Service, is offering a **FREE** ***“Fuel Reduction Chipping Program”*** to communities who have initiated a community wildfire risk assessment with the Maine Forest Service. Communities wishing to take advantage of this service should contact their local Forest Ranger or by calling 287-4990.

Communities should:

- ✓ *Request the use of the chipper and coordinate well in advance with their local Forest Ranger.*
- ✓ *Publicize the event in community newspapers, in newsletters, on bulletin boards, etc.*
- ✓ *Distribute the “Will Your Home Survive” firewise brochure to homeowners.*
- ✓ *Distribute and collect applications from homeowners.*
- ✓ *Provide a crew of at least four to assist in hauling and feeding brush into the chipper. Training and personal protective equipment will be provided .*

Homeowners should

- ✓ *Create defensible space within 30 feet of their home free from excess flammable vegetation.*
- ✓ *Trim “ladder fuels” (branches) at least ten feet (or no more than 1/3 the tree height) above the ground.*
- ✓ *Haul material to be chipped to within 5 feet of road on up-hill side; cut ends facing the same direction (towards road); piles should be no more than 4’ high x 20’ long; branches can be no more than 12” in diameter. Old dead wood dulls blades and should be disposed of by other means if possible.*

Ensure piles to be chipped are:

- ✓ *free of all roots, stumps, rocks and mud.*
- ✓ *free of any metal.*
- ✓ *Do not contain leaves, pine needles or lawn clippings. We cannot chip these.*

Communities benefit by: Reducing the risk of wildfire, keeping branches, brush and other debris out of expensive landfills, and using the by-product (chips) as mulch, for landscaping material, for trails or as bio-fuel.

The Maine Forest Service will:

- ✓ *Transport the chipper and collection vehicle to your community at no cost.*
- ✓ *Provide personnel to operate the chipper.*
- ✓ *Transport chips to a central location in the community unless desired by the homeowner.*



South Thomaston Boat Landing
11/16/16 – 1124 hrs. @ King Tide -:24



South Thomaston Boat Landing
11/30/16 – 1107 hrs. @ Normal High Tide -:08



South Thomaston Boat Landing
11/16/16 – 1124 hrs. @ King Tide -:24



South Thomaston Boat Landing
11/30/16 – 1107 hrs. @ Normal High Tide -:08



South Thomaston Keag Marsh
11/16/16 – 1135 hrs. @ King Tide -:13



South Thomaston Keag Marsh
11/30/16 – 1115 hrs. @ Normal High Tide -:01



South Thomaston Keag Marsh
11/16/16 – 1135 hrs. @ *King Tide* -:13



South Thomaston Keag Marsh
11/30/16 – 1117 hrs. @ *Normal High Tide*



Thomaston Boat Landing
11/16/16 – 1152 hrs. @ King Tide +:05



Thomaston Boat Landing
11/30/16 – 1132 hrs. +/- 5 min @ Normal High Tide -:19



Thomaston Boat Landing
11/16/16 – 1152 hrs. @ King Tide +:05



Thomaston Boat Landing
11/30/16 – 1132 hrs. +/- 5 min @ Normal High Tide -:19



Thomaston Harbor
11/16/16 – 1148 hrs. @ King Tide



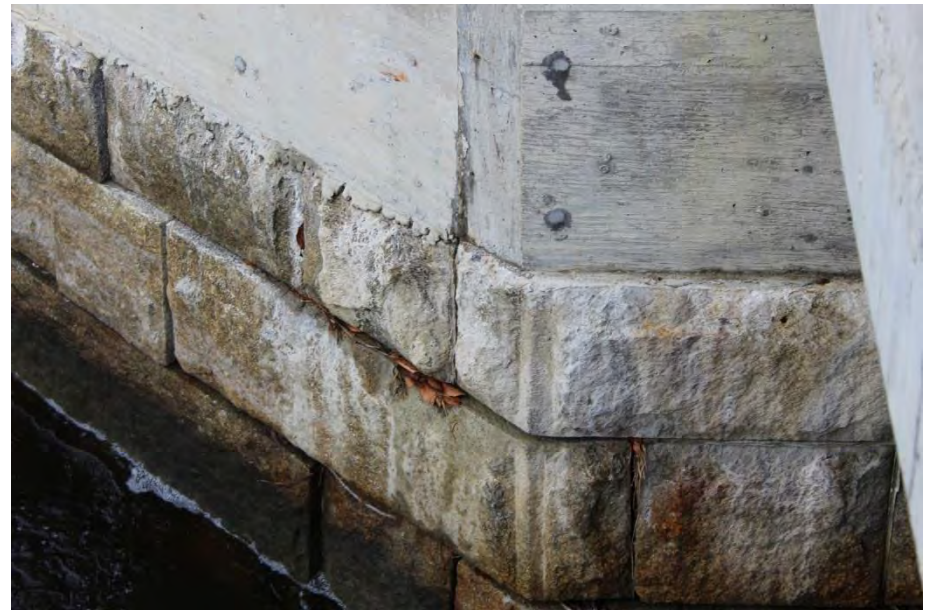
Thomaston Harbor
11/30/16 – 1130 hrs. @ Normal High Tide -:21



Cushing Salt Pond Culvert
11/16/16 – 1222 hrs. @ King Tide + :33



Cushing Salt Pond Culvert
11/30/16 – 1203 hrs. @ Normal High Tide +:42



Summary of Hazard Mitigation-related Meetings, Trainings, etc.

Local Emergency Management Director's Meetings	Available Documentation	Participants	Mtg Hrs	Travel Hrs	Total Hrs	
1/19/17	Update on plan progress; discussion of 12/13/16 Hazard Mitigation mtg; some municipal surveys complete	agenda, attendance roster	9	18	4	22
1/26/17	Update on plan progress; discussion of 12/13/16 Hazard Mitigation mtg; some municipal surveys complete	agenda, attendance roster	11	13.5	4.5	18
2/23/17	Update on plan progress; some municipal surveys complete but others still needed; Community Rating System discussed	agenda, attendance roster	13	11.25	4	15.25
3/16/17	Update on plan progress; Community Rating System discussed, info session scheduled	agenda, attendance roster	8	14	3	17
3/23/17	Update on plan progress; Community Rating System discussed, info session scheduled	agenda, attendance roster	9	9	5.75	14.75
4/19/17	Update on plan progress; Community Rating System discussed, info session scheduled	agenda, attendance roster	10	10	2.75	12.75
6/22/17	Mapping and GIS resources for hazard mitigation, etc. discussed	agenda, attendance roster	19	30	3	33
10/26/17	Update on plan progress; updates to projects for the plan revision needed by Dec 1	agenda, attendance roster	9	8	2.58	10.58
11/16/17	Update on plan progress; updates to projects for the plan revision needed by Dec 1	agenda, attendance roster	12	18	4.5	22.5
11/21/17	Update on plan progress; updates to projects for the plan revision needed by Dec 1	agenda, attendance roster	6	7.5	4	11.5
1/18/18	Update on plan progress, asking for municipality projects; RSMS project discussed	agenda, attendance roster, meeting minutes	14	21	5.67	26.67
2/22/18	Update on plan progress, asking for municipality projects; RSMS project discussed	agenda, attendance roster, meeting minutes	12	15	6.03	21.03
3/22/18	Update on plan progress, asking for municipality projects; RSMS project discussed; hazard mitigation workshop planned	agenda, attendance roster, meeting minutes	14	14	4.7	18.7
4/19/18	Grant discussed	agenda, attendance roster, meeting minutes	14	14	4.7	18.7
5/17/18	Update on plan progress	agenda, attendance roster, meeting minutes	10	17.5	5.33	22.83
6/21/18	Update on plan progress; everyone given a copy of their municipal map with current mitigation projects on them, feedback requested	agenda, attendance roster, meeting minutes	28	49	17.42	66.42

9/20/18	Update on plan progress; everyone given an updated copy of their municipal map with current mitigation projects on them, feedback requested	agenda, attendance roster, meeting minutes	11	14.3	5.17	19.47
10/18/18	Update on plan progress; everyone given an updated copy of their municipal map, asked for comments or other input before maps are finalized	agenda, attendance roster, meeting minutes	16	24	5.67	29.67
11/29/18	Update on plan progress	agenda, attendance roster, meeting minutes	14	24.5	10	34.5
1/17/19	Update on plan progress	agenda, attendance roster, meeting minutes	13	13	6.33	19.33
2/21/19	Update on plan progress	agenda, attendance roster, meeting minutes	17	12.75	6.47	19.22
3/21/19	Update on plan progress	agenda, attendance roster, meeting minutes	13	13	4.67	17.67

Sub-total:	176	232.05	82.16	314.21
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All Other Mtgs/Training/etc.		Available Documentation		Mtg Hrs	Travel Hrs	Total Hrs
3/18/16	RIST Instrument Meeting	attendance #'s only (from office spreadsheet)	5	12.5	1.25	13.75
3/29/16	GIS 101	attendance #'s only (from office spreadsheet)	9	18	2.75	20.75
4/26/16	MidCoast Regional Planning Commission Mtg	attendance #'s only (from office spreadsheet)	21	15.75	0	15.75
5/24/16	Making GIS Work for You	announcement, training certificates	11	22	0	22
6/8/16	ACES/Resilience SubCommittee	attendance #'s only (from office spreadsheet)	8	8	0	8
6/22/16	Making GIS Work for You	announcement, training certificates	3	6	0	6
10/18/16	Putting GIS to Work for You (GIS 101)	announcement, attendance roster	10	18	3.5	21.5
12/7/16	Putting GIS to Work for You (GIS 101)	announcement, attendance roster	8	60	6.25	66.25
12/13/16	Hazard Mitigation Planning - Kick-Off Meeting for Plan Update	agenda, attendance roster	36	54	11.25	65.25
2/8/17	RSMS Workshop	announcement, attendance roster	22	71.5	7.5	79
3/30/17	Hazard Mitigation Planning	attendance #'s only (from office spreadsheet)	4	5	5	10
4/13/17	RSMS Lab	announcement, attendance roster	13	65	11.5	76.5
4/24/17	Hazard Vulnerability Assessment Workshop	Sign-in sheet, handouts	8	24	9	33
6/15/17	Community Rating System Workshop	attendance #'s (from office spreadsheet), workshop notice	10	23	5	28
7/6/17	Community Rating System Workshop	attendance #'s only (from office spreadsheet)	3	6	10	16

Appendix E: Summary of Hazard Mitigation Related Participation

12/5/17	RSMS Case Study Workshop	announcement, attendance roster	14	28	2.75	30.75
2/13/18	RSMS Meeting	attendance roster	11	22	3.92	25.92
3/19/18	RSMS Meeting	attendance roster	14	21	6.03	27.03
3/27/18	Hazard Mitigation Workshop	attendance roster	20	30	21.78	51.78
6/13/18	RSMS (for interns)	attendance roster	5	11.25	15.83	27.08
10/20/18	Hazard Mitigation/CRS Checklist Mtg	attendance roster, agenda	24	126	15.37	141.37
12/4/18	Language of GIS	announcement, attendance roster	10	10	4.83	14.83
12/11/18	Language of GIS	announcement, attendance roster	5	7.5	1.33	8.83
1/7/19	Hazard Mitigation Plan Status Mtg	attendance roster	3	1.5	0	1.5
1/29/19	Language of GIS	announcement, attendance roster	9	11.25	0	11.25
2/22/19	Hazard Mitigation Grant Program / Hurricane Vulnerability Study Conference call	attendance roster	4	4	0	4
3/1/19	Hazard Mitigation Grant Program / Hurricane Vulnerability Study Mtg	attendance roster	5	12.5	3.92	16.42

Sub-total:	295	693.75	148.76	842.51
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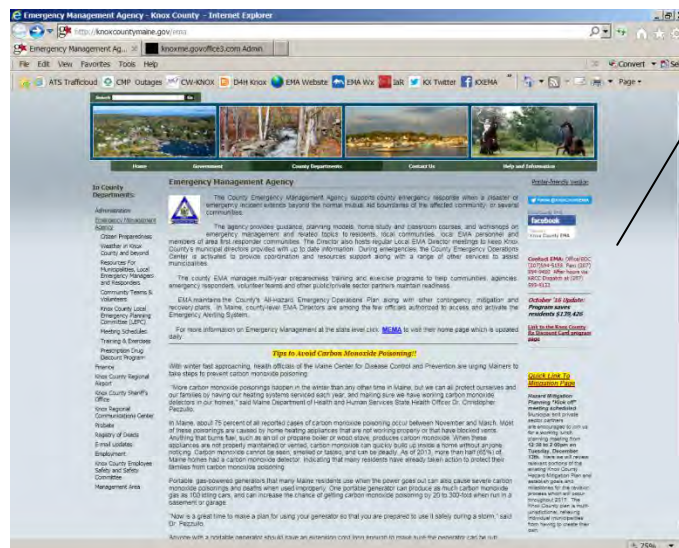
Participants	Mtg Hrs	Travel Hrs	Total Hrs
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Updated: 4/5/2019

Grand Totals:	471	925.8	230.92	1156.72
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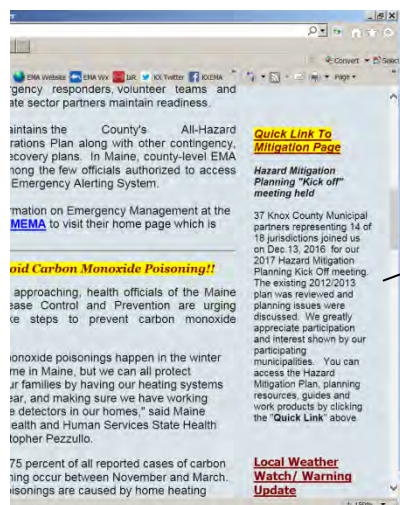
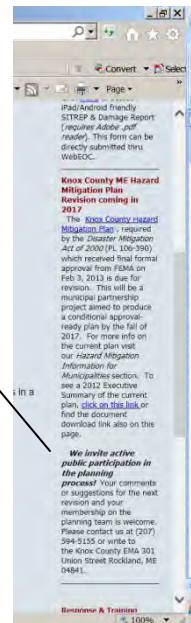
Knox County Mitigation Agency Plan Related Outreach- 2019 Revision

Source (X:) 4.HazardMitigation>Knox HMP 2019 Working Draft> Knox County Mitigation Plan Related Outreach Copy



EMA Home Page- Planning meeting advertised.
www.knoxcountymaine.gov/ema. As of 5 Dec, 2016

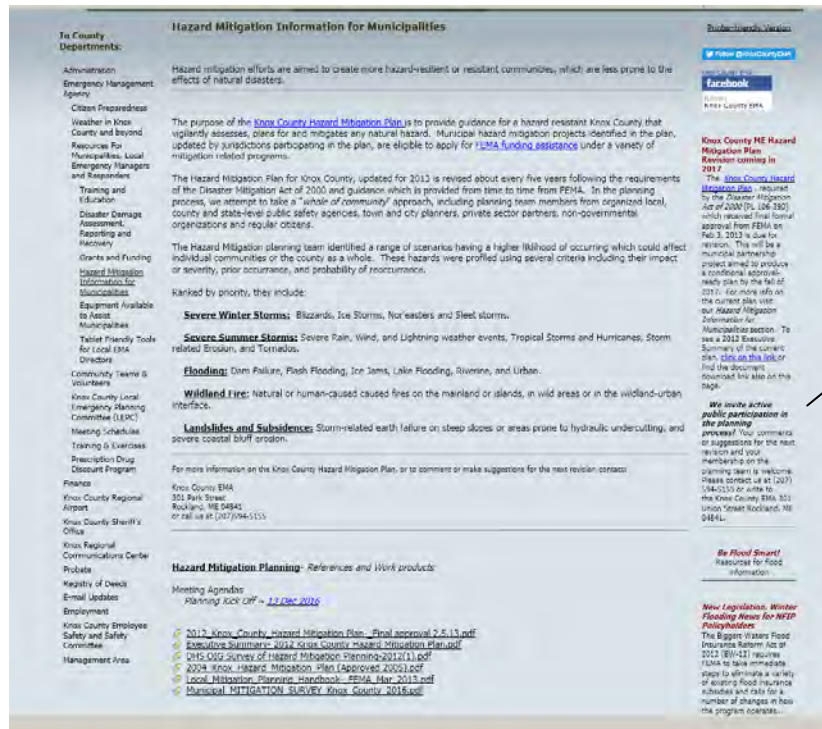
Sidebar from "Resources for Municipalities" section
www.knoxcountymaine.gov/ema. A/O 15 Dec, 2016



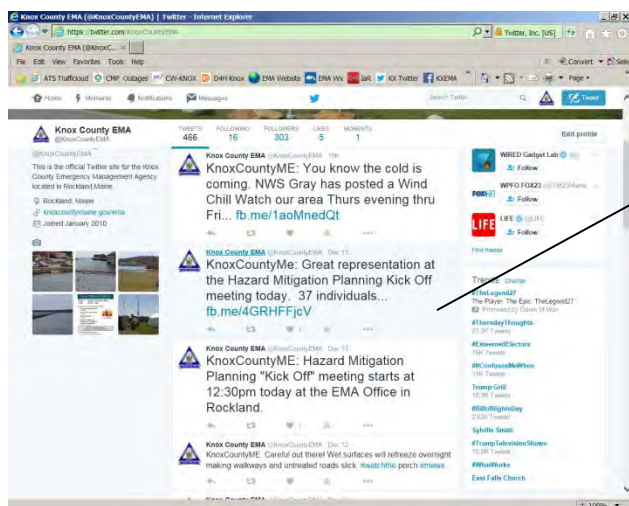
EMA Home page advertising completion and participation in mitigation planning kick-off meeting.
www.knoxcountymaine.gov/ema. A/O 15 Dec, 2016

Participants at status update and planning kick off meeting
13 Dec, 2016

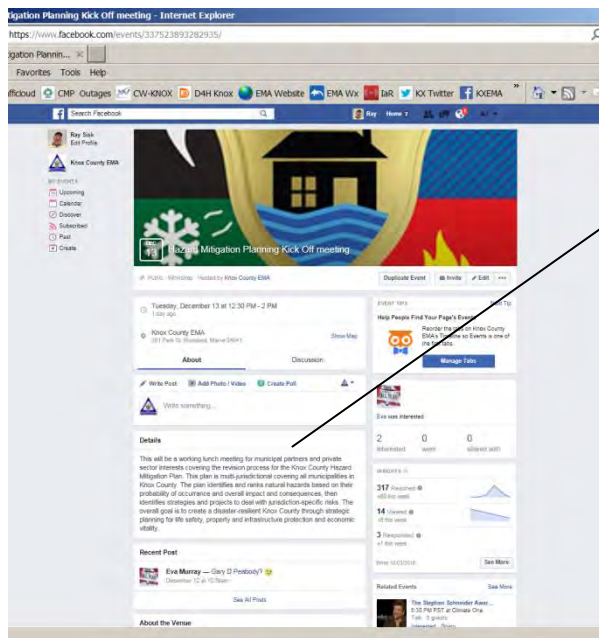




"Hazard Mitigation for Municipalities" page
www.knoxcountymaine.gov/ema
a/o 15 Dec, 2016

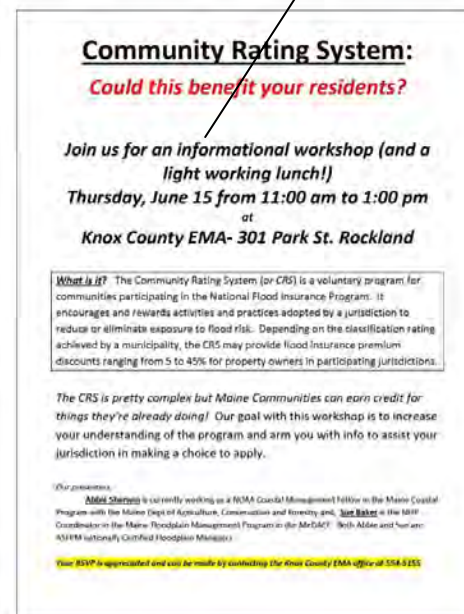



Social Media Content ~Twitter
Hazard Mitigation Related
@KnoxCountyEMA A/O 15 Dec, 2016



Social Media Content ~ Facebook Hazard Mitigation planning Event. 12.13.16 Planning Kick off meeting. Knox County EMA A/O 15 Dec, 2016

Flyer used to advertise Community Rating System (CRS) program held at Knox EMA on June 15, 2017





Knox County Emergency Management Agency
GIS Program

WORKSHOP ANNOUNCEMENT


You are invited to the *"Managing Local Roads with RSMS and GIS"* workshop to learn new ways to manage, maintain, and assess local roads. The workshop is hosted by the Knox County Emergency Management Agency GIS Program. Please forward to those who might be interested.

Wednesday February 8, 2017
9:00am to 1:00pm
Knox County EMA office (301 Park St, Rockland)
There is no cost for attendance at this workshop.

Workshop Synopsis: The ME Dept. of Transportation's *Road System Management Software*, or RSMS, is a powerful, low cost, easy-to-use, GIS enabled/compatible software to maintain, manage, and assess municipal roads. It is intended to introduce attendees to RSMS functions, and how it can be incorporated into Municipal/EMA GIS and planning. The workshop is intended to provide attendees with a hands-on experience with the software. The presenter is Jerry Douglass, GIS Manager.

To register, contact Leticia vanVuuren at (207) 594-5155 or gisp@knoxcountymaine.gov. If you have any questions, please feel free to contact Leticia vanVuuren.

CEUs will be provided upon request.



Knox County Emergency Management Agency
GIS Program

WORKSHOP/LAB ANNOUNCEMENT

You are invited to the *"Using RSMS for Local Road Management"* workshop/lab to learn more about using RSMS software to manage, maintain, and assess local roads. This is a follow-up practical session to the February 8th *"Managing Local Roads with RSMS and GIS"* workshop. The workshop/lab is hosted by the Knox County Emergency Management Agency GIS Program. Please forward to your road commissioners, public works departments, elected officials, and those who might be interested. *(Apologies for any duplicate notifications.)*

Thursday, April 13, 2017
9:00am to 3:00pm
Knox County EMA office (301 Park St, Rockland)
There is no cost for attendance at this workshop
Bring your own lunch or we can provide one for you for \$5 at the door


Workshop/Lab Synopsis: The ME Dept. of Transportation's *Road System Management Software*, or RSMS, is a powerful, low cost, easy-to-use, GIS enabled/compatible software to maintain, manage, and assess municipal roads. The presenter is Jerry Douglass, GIS Manager.

Requirements: Computer with RSMS16 already installed. "Download" on the left-hand side for a free installation to one per department or town.

Note: Let us know if you want a lunch!

To register, contact Leticia vanVuuren at (207) 594-5155 or gisp@knoxcountymaine.gov. If you have any questions, please feel free to contact Leticia vanVuuren.

CEUs will be provided upon request.



Knox County Emergency Management Agency
GIS Program

RESCHEDULED RSMS WORKSHOP/CASE STUDY

You are invited to the rescheduled *"Putting RSMS to use for Local Road Management"*. How 2 midcoast towns inventoried their roads, culverts, and poles. The workshop/case study is hosted by the Knox County Emergency Management Agency GIS Program. Please forward to your road commissioners, public works departments, elected officials, and those who might be interested. *(Apologies for any duplicate notifications.)*

Tuesday, December 5, 2017
1:00pm to 3:00pm
Knox County EMA office (301 Park St, Rockland)
There is no cost for attendance at this workshop
Seating is limited - Pre-registration is appreciated

Workshop Synopsis: How to manage your road maintenance to better control your budget. The ME Dept. of Transportation's *Road System Management Software*, or RSMS, is a powerful, low cost, easy-to-use, GIS enabled/compatible software to maintain, manage, and assess municipal roads. No need to re-invent the wheel, this workshop is intended to provide attendees with a case-study of Rockport and Union's 2017 RSMS projects.

To register, contact Leticia vanVuuren at (207) 594-5155 or gisp@knoxcountymaine.gov. If you have any questions, please feel free to contact Leticia vanVuuren.

CEUs will be provided upon request.

Examples of Transportation Infrastructure data management activities associated with Hazard Mitigation work in Knox County

In County Departments:

- Administration
- Emergency Management Agency
- Citizen Preparedness
- Weather in Knox County and beyond
- Resources for Municipalities, Local Emergency Managers and Responders
- Community Teams & Volunteers
- Knox County Local Emergency Planning Committee (LEPC)
- Meeting Schedules
- Training & Exercises
- GIS & Mapping
- Prescription Drug Discount Program
- [Hazard Mitigation Plan Page](#)
- Finance
- Knox County Regional Airport
- Knox County Sheriff's Office
- Knox Regional Communications Center
- Probate
- Registry of Deeds
- E-mail Updates
- Knox County Employee Safety and Safety Committee
- Management Area

Hazard Mitigation Planning

30 Day Public Comment Period closes on May 5, 2019

[Printer-friendly Version](#)

PUBLIC HEARING SCHEDULED

A Public Hearing will be held on **Thursday, April 25 from 2:00pm to 3:30 PM** at the offices of the Knox County Emergency Management Agency located at 301 Park Street in Rockland for the purposes of final public review and input for the 2019 revision to the **Knox County Hazard Mitigation Plan**.

The Knox County Hazard Mitigation Plan is a multi-jurisdictional plan which satisfies the requirements of the Disaster Mitigation Act of 2000, sets mitigation strategies, describes municipal concerns and identifies potential municipal mitigation projects. Adoption of the plan by each participating municipality is a prerequisite for a variety of mitigation related federal grants.

Interested county residents are invited to attend in person, or by teleconference. Please contact Knox County EMA at 594-5155 for information on attending remotely.

Get involved - make a difference!

See the draft 2019 revision of the Knox County Hazard Mitigation Plan on this page. This plan belongs to you and your municipality. Your comments are encouraged and welcome.

What is it?

This is a multi-jurisdictional plan that when adopted by your municipality, becomes its municipal Hazard Mitigation Plan. This is a five-year planning document which has customized information provided by your town. Participation by your town establishes eligibility for federal mitigation monies under several grant programs.

What do we plan for?

We look at all natural hazards and discuss prior events including specific events and disasters that have affected Knox County, but only the hazards which are the most severe and most likely are fully profiled and ranked.

What natural hazards are profiled?

Severe Winter and Summer Storms, Flooding, Wildfire and Landslides are our top five, in order of priority.

Why the Red and Black text?

This is a draft document which is scrutinized at local, county, state and federal levels. Black text is carried over from the 2013 version of the plan; strike thru text like this is being removed. Red text is new to this version. Once the plan receives its final *Approved Pending Adoption* stamp from FEMA, the plan will be put into its final form.

Approved Pending Adoption? What's that?

As a multi-jurisdictional plan, each municipality must adopt it through administrative action by Select Board, City Council or Board of Assessors. The County Commission adopts it on behalf of the Townships of the Unorganized Territory. A town may elect to *NOT* adopt the plan, but to retain grant eligibility, must then draft its own plan which is subject to the same approval requirements of the multi-jurisdictional plan.

How can I make comments or recommendations to the plan, or volunteer to help in other ways?

If you see something in the plan you would like explained, or if you have a recommendation for an improvement, please contact the Knox County EMA office at 594-5155. You may also email us at kxema@knoxcountymaine.gov. Your input is important to us!

Here are the **DRAFT** plan components as of April 5, 2019. Click on the link to view (opens in a new window).

[2019 Knox County Hazard Mitigation Plan Executive Summary](#)

[Table of Contents](#)

[Section 1- Overview](#)

[Section 2- Plan Adoption](#)

[Section 3- Planning Process](#)

[Section 4- Risk Assessment](#)

[Section 5- Mitigation Strategies](#)

[Section 6- Plan Maintenance Procedure](#)

[Appendix A- Maps](#)

[Appendix B- Municipal Surveys](#)

[Appendix C- Defensible Space](#)

[Appendix D- King Tide Companion](#)

[Appendix E- Participation](#)

[Appendix F- Outreach](#)

Last updated 4/11/2019

Knox County EMA Hazard Mitigation Webpage as of April 11, 2019
www.knoxcountymaine.gov/ema

Knox County EMA social media HMP outreach and information update. Posted April 11, 2019

Online media Knox Village Soup posted April 12, 2019